A New Lens on Inclusive Development: Enhancing the Framework, Constructing an Index, and Unveiling Dynamic Patterns in OECD Countries

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Abstract:

Inclusive development has emerged as a new benchmark in development economics, emphasizing socially oriented growth and equitable opportunities for participation and benefit from the growth process. However, evaluating progress toward inclusive development presents theoretical and practical challenges due to the lack of consensus on definitions, frameworks, and measurement approaches. As a result, monitoring inclusive development remains empirically challenging and often prescriptive rather than quantitative with limited evidence base. This paper addresses these challenges by identifying research gaps and proposing a multi-level theoretical framework with a better scope that integrates key facets of inclusive development and well-being within a novel, nested structure. The framework consists of four pillars: economic potential and progress, equitable opportunities and benefits, social inclusiveness and mobility, and environmental sustainability for the inclusivity and sustainability of development and its main elements. Building on this framework, we develop a new composite index with an enhanced methodological design suitable for societal and well-being indicators. The index incorporates 18 comparable key variables, aggregating indicators within each sub-index using the arithmetic mean (compensatory approach) and combining sub-indices using the geometric mean (non-compensatory approach). The relevance and practicality of our index is demonstrated through its application to 38 OECD countries from 2001 to 2019. Unlike existing indices that mainly focus on cross-sectional or short-term analysis (e.g., the World Economic Forum's IDI), our empirical analysis enables a dynamic assessment of progress over an extended time. We identify different patterns in the overall index and its sub-pillars and its comparison with the GDP per capita growth rates. This study's findings lay the groundwork for future research and the creation of effective strategies to foster inclusive development.

Keywords: inclusive development; OECD countries; inclusive growth; composite index; public policy, MSI approach.

Declaration: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

1. Introduction:

Conventional economic measures such as gross domestic product (GDP) can assess only a singular and restricted dimension of the economy: economic activities within the market (Costanza et al., 2009; Stiglitz, 2012). Different from how GDP measures market economic output, representing all facets of well-being in a single number is not straightforward. Thus, GDP becomes a proxy for economic welfare (i.e., the ability of people to control commodities) and general welfare (which is also determined by non-market activities), even though it was not designed to do this and does not have social welfare measures (Stiglitz et al., 2018). GDP falls short in capturing the essence and distribution of growth's benefits, rendering it inadequate for assessing a country's performance in terms of broader well-being concepts, including equity of income, wealth, and opportunities, mainly associated with access to education, health, and employment. Also, the "trickle-down effect," which entails growth ultimately benefiting the lower-income groups of the population and considering inequality as a by-product of the growth process, seems not to be materialized for many countries. Despite decreasing global poverty, inequality levels, particularly after the financial crisis of 2008, have risen in developing and developed countries (Berg & Ostry, 2017). Many detrimental consequences of increasing inequality include social exclusion, political instability, reduced social mobility, underutilization of human capital, and growing dissatisfaction with development outcomes (Milanovic, 2016; Piketty, 2014; Stiglitz, 2012). In this regard, despite being predominantly developed, OECD countries still grapple with rising levels of inequality during the last few decades (OECD, 2008, 2015a, 2017a, 2018a).

The inclusive growth/development concept emerges due to the magnitude and consequences of increasing inequalities and gains significant attention in academia and international organizations' publications. It is a new approach to economic development that focuses on inclusive socially oriented growth and highlights the notion of equitable opportunities for participation in and benefit from growth processes (Kakwani & Pernia, 2000). Its scope extends beyond tackling poverty (a concern primarily relevant to developing countries) and poor populations, involving recognizing the substantial adverse effects of increasing inequality on the non-poor population. Inclusive development is a multifaceted concept that focuses on both the speed and structure of growth, ensuring a harmonious integration of economic, social, and environmental dimensions. It aims to maintain a dynamic equilibrium that promotes fairness and sustainability across both present and future generations. While the concept of inclusive growth/development is relatively new, it shares a consistent and close connection with the established concepts of sustainable development and theories of well-being, which aim to address non-monetary facets of well-being. The Human Development Index (HDI), introduced in the United Nations Human Development Report in 1990, is arguably the most renowned and pioneering example of a well-being approach aiming to measure inclusiveness on the so-called capability approach (Sen, 1985, 1990). Development is understood in a broader, more inclusive context, focusing on various factors beyond income-

related measures. It is widely recognized that income itself has no inherent value for human well-being but instead serves as a means to enhance other essential aspects of development.

Until now, empirical and quantitative research on inclusive growth/development is limited, and the concept is primarily described rather than quantified. Inclusive development is a multidimensional and complex concept that includes income- and non-income economic and social dimensions. However, no comprehensive consensus exists on its definition, and a universally accepted measurement tool still needs to be discovered. So far, in the relevant literature, there exist various definitions of inclusive growth/development focusing on different facets of well-being such as poverty, inequality, productive employment, social protection, participation, and access to opportunities (Grosse et al., 2008; Ianchovichina & Lundström, 2009; Kakwani & Pernia, 2000; Klasen, 2010; McKinley, 2010; Rauniyar & Kanbur, 2010; Son & Kakwani, 2008). Based on these diverse definitions, many studies and organizations, such as OECD, ADB, and WEF, propose their frameworks for capturing inclusive growth/development phenomena; however, there are some limitations in their conceptualisation of inclusive growth/development primarily associated with underestimating the ecological aspect (These limitations are discussed in detail in section…) Regarding its measurement, there are two general methods in place: the first is the "social opportunity function" approach, rooted in the work of Ali & Son (2007), and the second is the "indicator evaluation" based on McKinley (2010) which establishes an indicator system from a definition or theory (frameworks) and constructing a composite index. In this regard, constructing a composite index is the most promising method for gauging inclusive development. So far, several indices have tried to portray the qualitative facets of economic growth/development, like the inclusive development index of WEF or the inclusive green growth of the Asian Development Bank. However, these indices have some limitations regarding their variable choices and construction methodologies. Also, to the best of our knowledge, many empirical analyses for measuring inclusive growth/development have a cross-sectional manner or within considerably shorter periods (like five years). These aspects require further reinforcement. A key consideration is that inclusive development is inherently multidimensional, necessitating the integration of an expanding range of fundamental economic, social, and institutional dimensions. As the scope of these dimensions broadens, the aggregation process becomes increasingly complex, introducing challenges related to measurement consistency, trade-offs between indicators, and potential endogeneity issues. This complexity influences the structural relationships between the chosen indicators, affecting the robustness and interpretability of composite measures. Consequently, ensuring methodological rigor in weighting schemes, normalization techniques, and sensitivity analyses becomes critical for capturing the true dynamics of inclusive economic development.

An enhanced approach to evaluate inclusive growth/development would empower countries to pinpoint the shortcomings of their current economic growth model, specifically its limitations in addressing diverse economic, social, and environmental challenges, to strategically implement measures to overcome these deficiencies. So, the primary purpose of this paper is to address these gaps in existing literature through both theoretical and empirical investigations. This goal is pursued through the following specific objectives: Firstly, we critically evaluate the existing literature on the concept of inclusive growth/development, highlighting the main characteristics of its definitions and formulate an enhanced framework of it by combining and adding critical factors that are essential for human-centred development

and well-being. So, we frame our multi-level framework of inclusive development with four main pillars "Economic Potential and Progress (EPP), Equitable Opportunities and Benefits (EOB), Social Inclusiveness and Mobility (SIM), and Environmental Sustainability (ES). Each pillar has three domains to cover the main characteristics of them. This framework has some advantages compared to others: It has a better scope compared to the prominent Human Development Index (HDI). Secondly, our framework explicitly defines categories and sub-categories with direct connections to all main aspects of inclusive development based on different existing definitions. Therefore, the four pillars in our framework correspond directly to the four main principles of inclusive development definition: EPP for growth and economic foundation (without inclusion part), EOB related to poverty reduction and income inequalities in benefits and opportunities, SIM for the non-income dimension of equity in benefits and opportunities, and ES as the newest aspect for enhancing the overall sustainability of development trajectory. Then, based on our enhanced theoretical framework, we create an inclusive development composite index with more comparable and robust variables and enhanced index construction for OECD countries from 2001 to 2019. The results of the Inclusive Development Index allow for a better comparison of countries by exploring different trajectories of inclusive development performance over 19 years.

The remainder of the paper is organised as follows: In section 2, we present a discussion of inclusive development regarding different frameworks and definitions and a brief discussion of previous development measures like HDI and IDI of WEF. Section 3 is dedicated to the detailed research design of the theoretical framework and methodology. An overview of the index results and a discussion of the usefulness of our framework and index will be presented in section 4. Section 5 concludes.

2. Understanding the concept of inclusive development

2.1. The roots of inclusive development:

The GDP, widely employed as a gauge of a nation's economic advancement, is recognized for its utility in accounting for economic output, value addition, productivity, and relationship with variables such as employment. It is regarded as a proxy for individuals' well-being for a long time; however, it does not even provide a sufficient measure of economic activities, so quality must be considered rather than quantity (Costanza et al., 2009). GDP fails to provide insights into how growth is distributed, whether it pertains to income, consumption, health, education, or any other factor. So, relying solely on GDP as a prosperity metric overlooks the crucial aspect of discerning who is gaining wealth and in what manner. The relationship between economic growth and income distribution has long been a topic of debate. The prevailing theoretical framework is the Kuznets curve (1955), which suggests that inequality is an expected outcome in the early stages of economic growth and serves as a mere by-product of economic progress. Therefore, an initial deterioration in income distribution was followed by a subsequent enhancement in the circumstances of the less fortunate as the positive impacts of the growth spurt gradually disseminated. This eventual improvement is what is referred to as the "trickle-down effect." However, the fundamental premise of the Kuznets curve has been challenged by studies on the determinants of inequality (Kanbur, 2000; Yin, 2004), which found inconsistencies with its predictions. As a result, it has been replaced by a more nuanced perspective, suggesting that development can be achieved through various pathways, each

associated with different patterns of income distribution (Ranieri & Ramos, 2013). Also, within various countries, rapid economic expansion coincides with an increase in inequality, and the growth trajectory does not yield a decisive moment at which the initial trend is reversed (Berg & Ostry (2011). From the 1970s through the 1980s and the beginning of the 1990s, East Asian countries experience growth in income per person while maintaining relatively steady and low levels of inequality (Ranieri & Almeida Ramos, 2013), bringing about a shift in "development thinking" that growth and equity are not conflicting objectives.

In the late 1990s and early 2000s, the pro-poor growth with the main concern of ensuring that poor people benefit from growth became pervasive in development policy discussions. It has two absolute and relative definition primarily emphasises growth should contributes to the reduction of poverty and income inequality. The absolute definition of pro-poor growth, as stated by Ravallion and Chen (2003), asserts that economic growth is considered pro-poor only if it leads to an increase in the average income of poor individuals, thereby reducing income poverty. In contrast, the relative definition, proposed by Kakwani et al. (2003), views economic growth as pro-poor when the incomes of poor individuals grow at a faster rate than those of the non-poor. This perspective suggests that poverty declines more substantially than it would if all income levels increased at the same rate. However, these definitions do not account for other aspects of well-being, such as non-income inequalities or the multidimensional nature of poverty. Also, it mainly is centred on outcomes rather than processes which emphasises the enhancement of opportunities for individuals to actively engage in the growth trajectory. The concept of the inclusive growth gained prominence following the era of pro-poor growth. Some of its definitions build upon or compare it to pro-poor growth, while others present a completely distinct perspective (Ranieri & Almeida Ramos, 2013).

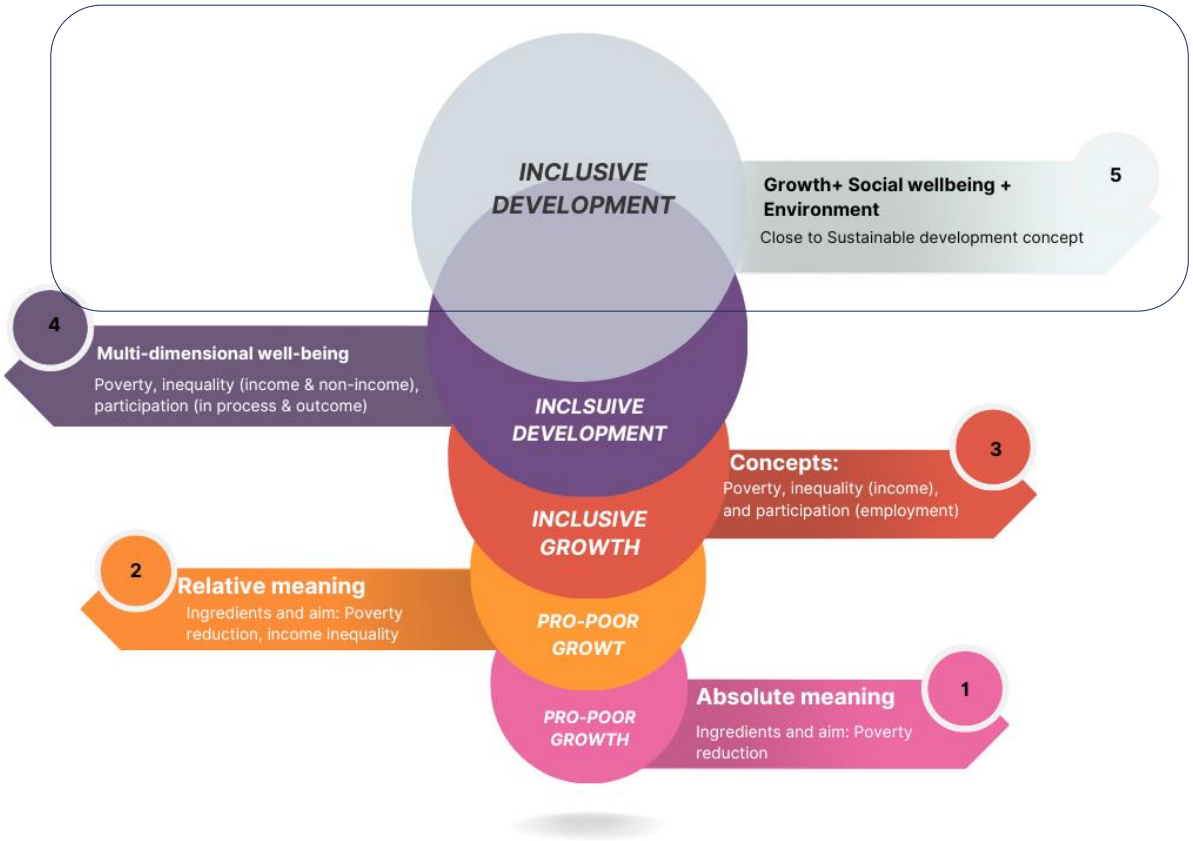
2.2 Definitions of inclusive growth/development

The term "inclusive" became related to the growth process for the first time at the start of the 20th century when Kakwani and Pernia (2000) characterize it as a type of growth that empowers the poor to actively engage in economic activities and reap substantial benefits. What sets apart their novel notion of inclusive growth or pro-poor growth is its emphasis on participation, linking it to a more comprehensive concept than the previous understanding of pro-poor growth. Inclusive growth extends beyond mere income and wealth inequality, placing significance on empowering individuals to partake in the growth progression instead of relying solely on income redistribution policies for poverty or income inequality alleviation. Ianchovichina and Lundström (2009) define inclusive growth a type of growth that includes both the pace and pattern of growth, functioning as a linked process that leads to a positive overall income increase. The pattern in this definition focuses on maintaining sustainability over the long term and undertaking structural shifts to encourage economic diversification and competitiveness by creative displacement of jobs and firms and including a significant portion of the country's workforce. In the novel perspective of inclusive growth by Ali and Son(2007) the focus change from results to opportunities, emphasizing distributional aspects. In this perspective inclusive growth as a type of development that produces new economic possibilities and ensures that all segments of society have equal access to these opportunities irrespective of their circumstances. There is a main distinction between inclusive growth and

development in a sense that inclusive growth pertains solely to income related aspects (both benefits and opportunities) while inclusive development t extends to non-income dimensions be defined as a "growth with equal opportunities" including economic, social, and institutional aspects beyond just income (Klasen, 2010; McKinley, 2010; Rauniyar & Kanbur, 2010). In addition, inclusive development can be seen as a welfare approach to development and is about creating jobs for the poor to increased incomes, assets, and other social goods and stimulates competition and GDP growth. So, inclusive development is a form of development that include marginalized individuals, sectors, and nations within social, political, and economic systems, with the goal of enhancing human well-being, promoting social and environmental sustainability, and fostering empowerment. It also aims at preventing the prioritization of economic interests over society and the environment, which often leads to enduring income inequality (Gupta et al., 2015).

As explained, there are different definitions of inclusive development exist in the literature literature, varying from those closely aligned with pro-poor growth to others that include a wide array of elements. But, for sure we can see a path of evolving definitions that gradually incorporating new facets and adding complexity to its multi-dimensional nature. In the figure 2, we illustrate the evolution of definitions for inclusive development and categorize this progression into distinct stages based on own interpretation of the relevant literature:

Fig 1: Evolution path of inclusive growth/development definition



Source: Own illustration

(1) & (2): It revolves primarily around poverty reduction, akin to pro-poor growth (both absolute and relative definition).

(3) It includes participation aspect (including people in growth process not just benefits of growth) that refers to inclusive growth.
(4) Then it encompasses considerations of both income and non-income inequality and poverty (in terms of both opportunities and benefits) that refers to inclusive development.
(5) Stage 5 is an inclusive development concept including environmental sustainability aspect which isunderrepresented in inclusive development literature. Until stage(4) all of definitions of inclusive growth or development in the related literature are based on the relationship between economy and society without considering the environment aspect, and environment-economy nexus was separately referring to as green economy or green growth (UNEP, 2011; World Bank, 2012). The only exception is Gupta et al. (2015) who believe the difference between inclusive development and inclusive growth is that inclusive development, places a significant focus on the social and environmental dimensions of "sustainable development."

Stage 5 is an inclusive development concept including environmental sustainability aspect which is underrepresented in inclusive development literature. We can argue that it is close to Sustainable Development Goals (SDGs) concept in a sense of including economic growth, social wellbeing, and environmental aspects, however, SDGs include many variables (17 goals, with 169 targets and 232 indicators) making it hard to be practical and track the progress of them for a long time. As Stiglitz et al. (2018) aptly point out, the demand for comprehensiveness in the Sustainable Development Goals (SDGs) has had an unintended consequence—there are too many goals for them to be meaningfully understood or effectively prioritized in policymaking.. We assert that achieving inclusive development necessitates a sustainable environment, making the ecological dimension an integral facet rather than a separate component of the inclusive development concept. Emphasizing this dimension is crucial for fostering broad-based and enduring growth. This is because poor people rely heavily on local resources such as soil, forests, fish, and water and are susceptible to encroachment on land, water, fish, and carbon credits (Zoomers, 2010; Fairhead et al. 2012; and Leach et al, 2012). Also, significant disparities can be linked with ecologically unsustainable production and consumption practices as well as ineffective utilization of natural resources (Gupta et al, 2015).

2.2 Inclusive Development in Practice

This section explores previous efforts of development indices and various methods for measuring inclusive development, highlighting their limitations. Within the existing literature, there exists a limited body of empirical studies focused measuring inclusive development. The process of measuring inclusive growth is intricate due to the absence of a universally accepted definition in the literature, and gauging multi-dimensional concepts is generally not a straightforward undertaking. In general, in the literature, measuring inclusive growth has two primary approaches: Social opportunity function by Ali and Son (2007), applied in the context of the Philippines, and constructing a composite index which is the main method for quantitatively assessing inclusive development and other complicated multidimensional concepts.

Ali and Son (2007) introduced the concept of a social opportunity function, which parallels the social welfare function in microeconomics but focuses on opportunities rather than outcomes, aligning with their definition of inclusive growth. Their method enhances the social opportunity function by considering two key factors: the average level of opportunities available to the population and the distribution of these opportunities among individuals. Inclusive growth, in terms of the social opportunity function, can be measured through two approaches: partial and full. The partial approach is derived from the opportunity curve, while the full approach is based on an index calculated from the area under the opportunity curve. They put it into practice in the case of Philippines using data from the 1998 Annual Poverty Indicator Survey (APIS1) in 1998. They constructed opportunity curves and indices for multiple opportunities including employment opportunities, access to diverse healthcare facilities, primary and secondary education access, and access to fundamental infrastructure. Ali & Son's (2007) approach to measuring inclusive growth emphasizes the participation aspects of achieving inclusive growth rather than focusing on well-being outcomes. However, a notable practical challenge emerges in the need to calculate distinct opportunity curves separately. Furthermore, implementing this approach requires micro-level household surveys tailored to each country, adding a layer of complexity. Moreover, whether and to what extent this method can be effectively applied for cross-country comparisons remains unclear. One of the papers that use this method for a cross-country comparison is Anand et al. (2013), which only considers GDP per capita (PPP) and income distribution (from survey data) in a narrow definition of social opportunity function, trying to integrate analysis of growth and income distribution by a unified measure. Consequently, it appears that, in general, Ali & Son's method may not be the most pragmatic choice for conducting cross-country comparisons of inclusive growth/development performance.

One of the earliest and most widely recognized composite indices designed to measure multiple dimensions of development beyond just economic indicators like GDP is the Human Development Index (HDI) by the United Nations Development Programme (UNDP) dating back to 1990s. It is arguably the most renowned and pioneering example of a well-being approach aiming to measure inclusiveness on the so-called capability approach, albeit without fully embracing the scope or methodology of it. The capability approach is a well-known theoretical framework used in normative analysis to assess well-being. This framework shifts the emphasis away from the resources individuals possess and the public goods they can access (referred to as 'means') and instead focuses on what individuals can actually achieve and become with those resources and goods (referred to as 'ends') (Sen, 1990). Scholars of the capability approach describe capabilities as freedoms that represent tangible opportunities (Kaufman, 2006; Sen, 1985, 2002). The HDI holds a prominent position in empirical research, with many experimental works incorporating it directly by utilizing its values or indirectly by employing its constituent dimensions and variables beyond national contexts. This composite well-being index serves as a viable metric besides GDP per capita figures that is the commonly relied upon in development discourse. Besides, it underscores the possibility of systematically integrating capability-related data as a credible complement to economic metrics. The HDI provide a measure of development by incorporating three key dimensions of human development: health, education, and income. The health and longevity dimension indicated by life expectancy at birth. The education facet includes two indicators: "expected years of schooling" and "mean years of schooling for adults aged 25 years." Lastly, the standard of living dimension is represented by the indicator of GNI per capita (PPP), ensuring a decent

quality of life. The HDI employs the logarithm of income as a measure to account for the diminishing significance of income as Gross National Income (GNI) increases. In this context, a set of values is defined as reference points. These reference points are used to transform various indicators, initially expressed in different units, into indices that are standardized and range from 0 to 1. These benchmarks function as both the starting point or "natural zeros" and the desired objectives or "aspirational targets" against which individual indicators are standardized. As a result, the country's scores depend on the selected boundaries, which seem to be chosen arbitrarily. Although the Human Development Index (HDI) was initially designed to measure progress in fulfilling basic human capabilities, it falls short as a comprehensive metric for inclusive development. This is because it primarily captures specific aspects of human development and capabilities rather than the broader dimensions of inclusivity. Additionally, the varying capabilities and subjective well-being needs across countries make it an imperfect development measure. In high-income countries, individuals may have more complex needs, making certain capabilities more significant than in low-income countries. (Dörffel & Schuhmann, 2022). It fails to address other crucial factors, such as inequalities, poverty, human security, and other essential facets of inclusive development. For a more comprehensive understanding of a nation's state of human development and well-being, it is crucial to consider additional indicators and data. Recognizing these limitations, the UNDP introduces other indices like the Gender Development Index (GDI) alongside the conventional HDI to encompass additional dimensions of human well-being, although without environmental sustainability aspect. However, relying on separate indices is impractical for assessing inclusive development performance. The Human Development Index (HDI) faces challenges related to its aggregation method. Initially, it uses the arithmetic mean to combine its three core dimensions. However, this approach receives substantial criticism for allowing perfect substitutability between dimensions (see, for example, Ray, 2008). To address this issue, the aggregation function is modified to use a geometric mean after 2010 (UNDP, 2010; Klugman et al., 2011), which accounts for the degree of substitution between dimensions. However, the geometric mean has a notable limitation, as it collapses to zero when any variable takes a value of zero and approaches zero when variables are close to zero (Biggeri et al., 2019).

The Inclusive Development Index (IDI) by the World Economic Forum (WEF) represents an effort to translate the concept of inclusive development into practice. In 2017, the WEF published the Inclusive Growth and Development Report, introducing a new economic policy framework and its national-level metric, the IDI. This initiative aimed to move inclusive growth and development from a mere aspiration to a practical approach, serving as a guide for policymakers and stakeholders to foster greater synergy between economic growth and broader improvements in living standards. The composite index is structured around three main domains: growth and development, inclusion, and intergenerational equity and sustainability, each comprising four indicators. Growth and Development. The World Economic Forum (WEF) mentions that it selects its pillars and indicators by drawing from existing research and making informed judgments based on past experiences (not a a direct cause-and-effect relationship between these domains and inclusive development, whether considered individually or together). However, in section 3 we will explain how this classification and domains cannot comprehensively cover inclusivity of development and its main elements. The WEF does not apply different weights to its pillars and variables. Instead, it uses a linear min-max normalization method, converting values to a 1-to-7 scale (from worst to best). The aggregation follows a step-by-step process, where individual indicator scores are combined

into pillar scores using an arithmetic mean. It calculated IDI scores and ranks 109 advanced and emerging countries in 2017. The WEF also calculates this index for 2018 for 103 countries. Unlike HDI, the IDI incorporates monetary inequality measures. However, it has some limitations regarding its variables choices and the construction setting. For instance, relying on labor productivity may not accurately capture the distribution of productive employment, as increases in average labor productivity could primarily result from advancements in a few capital-intensive sectors.

Additionally, the dependency ratio, while included, is not a performance indicator but rather a demographic one. Moreover, the IDI offers only cross-sectional data for 2017 and 2018, along with five-year trends. This restricted timeframe limits the capacity for meaningful analysis of long-term development. Like HDI, it has upper and lower boundaries (goalposts) for normalizing variables that are particularly challenging to comprehend. But the most important problems with this index is the robustness of its framework for not inclusion of important aspects and variables of inclusive development (like the absence of environmental dimension and education variables). It also highlights a well-known issue related to using the arithmetic mean in index construction. This challenge is particularly significant when developing a composite index for guiding development practices, especially given concerns about integrating interconnected indicators and dimensions (Saltelli, 2007). The arithmetic mean implicitly treats all dimensions and indicators as perfect substitutes, disregarding the possibility of positive synergies that could accelerate development or negative externalities that might impede progress in other areas (Biggeri et al., 2019).

In addition, in 2018, the Asian Development Bank (ADB) released a report introducing a composite index termed "Inclusive Green Growth Index (IGGI)" for assessing the quality of economic development. This report contends that the concept of Inclusive Green Growth harmonizes with both the "Sustainable Development Goals (SDGs)" and the Paris Climate Agreement. It is structured around three fundamental pillars: economic growth, social equity, and environmental sustainability, encompassing a set of 28 indicators. This framework uses min-max normalization to scale performance from 1 to 6, with 1 being the worst and 6 the best. All indicators within a pillar are equally weighted, and pillar scores are obtained by taking a simple average of the normalized indicator scores. This index was calculated for 45 Asian countries in 2015, but only 28 countries have results for all three pillars and overall inclusive green growth, likely due to data limitations. This index encounters similar challenges in variable selection and aggregation methods for index construction as those identified in the IDI of the WEF. Also, it employs twice as many variables for the social equity pillar compared to the other two pillars. Even when this disparity doesn't disproportionately influence the final inclusive green growth score due to the use of a simple average during score aggregation, it's crucial to acknowledge that a substantially higher number of indicators within one pillar makes that pillar more susceptible to variations when compared to the other two. Another concern arises from the choice of variables, particularly in assessing their conceptual appropriateness for inclusive development. Variables like natural resources rent and renewable internal freshwater resources may pose challenges in terms of their relevance and comparability across different countries. In Section 3, we explain in detail the importance of selecting variables with a clear conceptual positive or negative relationship to the Inclusive Development Index to ensure interpretability. To the best of our knowledge, the indices discussed above represent the most significant efforts to measure inclusive development. However, various organizations

have also developed frameworks that contribute to this area, including the World Bank (2012), GSDRC (2015), IMF (2013), the International Policy Centre for Inclusive Growth (IPC-IG, 2013), the Inclusive Growth Analysis Unit (IGAU) at the University of Manchester (2019), the Royal Society of Arts (RSA, 2017), OECD (2018), and the Scottish Government in collaboration with IPPR Scotland (2022).

Table 1: Definitions of inclusive growth

Ali and Son (2007)	Growth is considered inclusive when it enhances the social opportunity function, which is determined by two key factors: (i) the overall availability of opportunities for the population and (ii) the distribution of these opportunities among individuals.
Habito (2009)	Habito defines the inclusiveness of economic growth as GDP growth that results in a substantial reduction in poverty.
Ianchovichina and Lundstrom (2009)	In essence, inclusive growth involves accelerating economic growth and expanding the economy while ensuring equal opportunities for investment and fostering productive employment.
Rauniyar and Kanbur (2010)	They differentiate between inclusive growth and inclusive development: Inclusive growth occurs when economic growth is accompanied by reduced income inequality, ensuring that income gains disproportionately benefit those with lower incomes. Inclusive development refers to the simultaneous improvement in overall well-being across various dimensions beyond income, while also enhancing average achievements.
McKinley (2011)	McKinley identifies two key dimensions of inclusive growth: (1) Achieving sustainable growth that generates and expands economic opportunities. (2) Ensuring wider access to these opportunities, allowing all members of society to participate in and benefit from economic growth.
Klasen (2010)	Inclusive growth is considered broader than pro-poor growth, as it aims to benefit all segments of society, including the poor, near-poor, middle-income groups, and even the wealthy. In terms of outcomes, it can be described as "disadvantage-reducing" growth.

Table 2: Components of different Inclusive development indices

IDI of The WEF	IGG of The ADB	HDI of the UNDP
1. Growth and Development: • GDP per capita • Labor productivity • Healthy life expectancy • Employment **2. Inclusion:** • Median household income • Income Gini • Wealth Gini • Poverty rate **3. Intergenerational Equity and Sustainability:** • Adjusted net saving • Dependency ratio • Public debt • Carbon intensity of GDP	**1. Economic growth:** • GDP per capita growth rate • Inverse CV of GDP per capita growth • Trade openness • HH Market Concentration Index • Age dependency ratio • Adjusted net savings • Gross general government debt **2. Social equity:** • Employment–population ratio • Life expectancy gender gap • Primary enrolment gender gap • Labor force participation gender gap • Life expectancy at birth • Infant mortality rate • Access to improved water • Access to electricity • Gini coefficient on inequality • Poverty gap • Mean years of schooling • Primary completion rate • Political participation gap • Access to improved sanitation **3. Environmental sustainability:** • Natural resource rent • Renewable freshwater resources • Water productivity • Air pollution • CO2 per GDP • Energy intensity of primary energy • Use of renewable energy	**1. A decent Standard of living:** • GNI per capita **2. Knowledge:** • Expected years of schooling • Mean years of schooling 3. **Long & healthy life** • Life expectancy at birth

2.2. Brief overview of empirical work on inclusive development

There are many empirical papers use the statistical principal component analysis (PCA) in developing their inclusive growth/development index for identifying various dimensions within the variables or to derive variable weights for the aggregating process like Dörffel and Schuhmann (2022). examine the social and economic heterogeneity of CEE countries by testing their hypothesis using two multivariate techniques: factor analysis and principal component analysis. They select their variables of inclusive growth based on seven pillars of inclusive growth in WEF (2017) and 17 sustainable development goals (SDGs) of United Nations (2015). However, this method exhibits inherent limitations and incompatibilities for measuring inclusive development phenomena. (Mazziotta & Pareto, 2019; Mishra, 2007, 2008; Somarriba & Pena, 2009). These limitations can be summarized as: (1) Inclining to favour highly correlated indicators while disregarding others, regardless of their potential contextual significance. Consequently, numerous essential but weakly correlated indicators may remain unrepresented within the composite index. And the correlations computed may not faithfully represent the true influence of the sub-variables. (2) Influencing of outliers on correlation coefficients between individual indicators in unpredictable ways (3) The interpretation of weights is evident from a mathematical perspective but holds limited relevance to the objective of assessing various aspects of inclusive development. Consequently, the weights assigned to individual indicators often lack socio-economic significance. (4) Principal Components Analysis (PCA) stands out as a prevalent multivariate statistical approach for reducing datasets characterized by numerous dimensions. However, it is crucial to note that PCA fundamentally relies on a reflective measurement model. This characteristic renders it unsuitable for certain categories of indicators, particularly those pertaining to well-being.

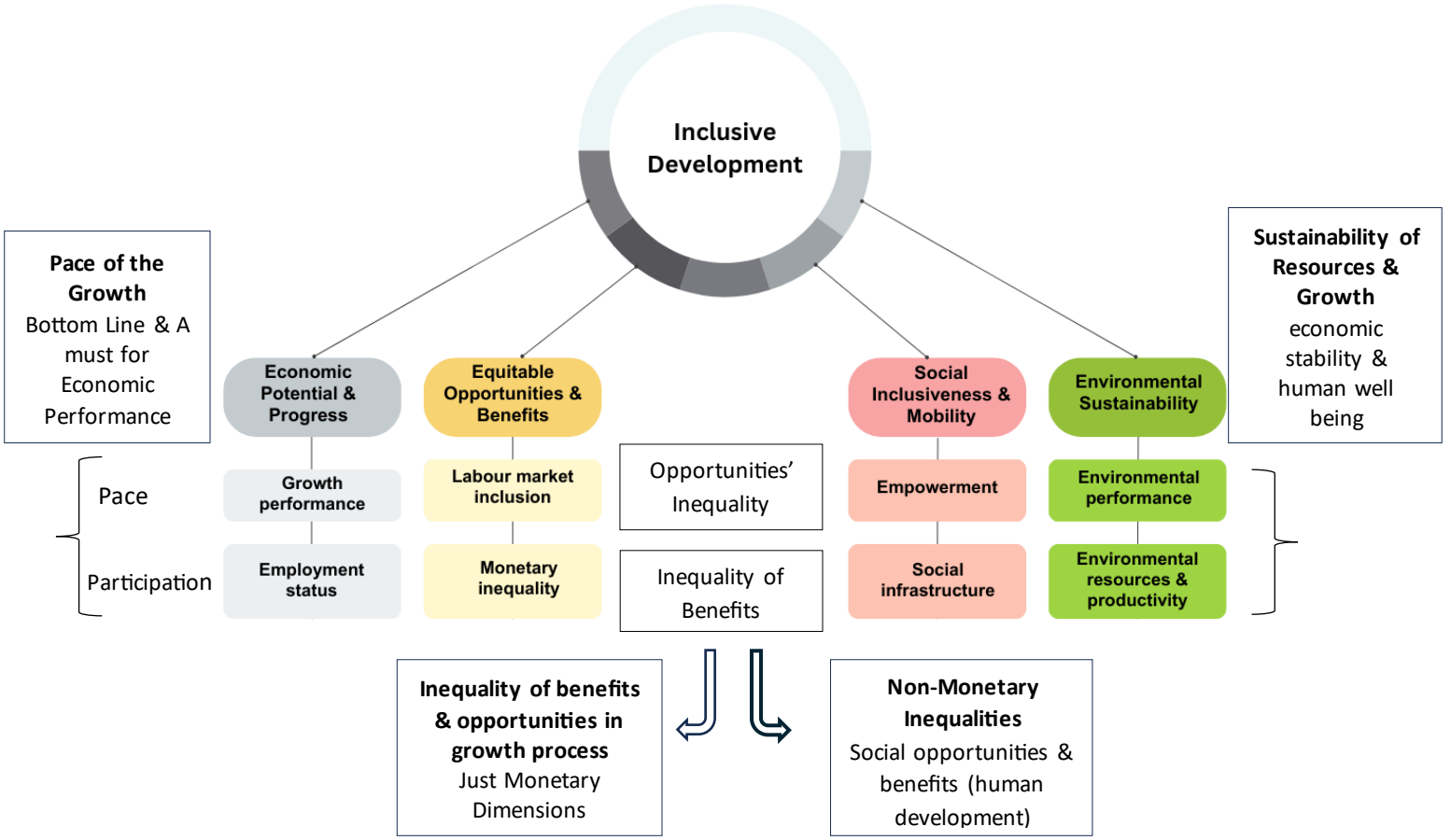
Empirical studies have examined inclusive development at different scales. Meng Li et al. (2021) conducted a cross-sectional analysis and developed an inclusive green growth indicator system using factor analysis and the Entropy Weight Method. Their approach integrates 26 indicators to assess 37 countries and regions in the Asia-Pacific. Grounded in the theoretical frameworks of the World Bank (2012) and the Global Green Growth Institute (2013), their model evaluates inclusive green growth across four key dimensions.

3. Research Design and Model Specification

3.1. Designing an Enhanced Multi-Level Framework

For constructing the Inclusive Development Index, a robust theoretical framework is the most critical part that determines the index's effectiveness and accuracy. So far, we explained that one of the biggest challenges of the inclusive development concept is the need for a unified definition. Also, we listed different gaps and limitations of the existing frameworks, definitions, and indices on which many researchers and organizations measure Inclusive development phenomena on different scales. So, to fill these gaps, we design our framework by including all critical facets of Inclusive development and classifying and categorizing them in a novel, well-organized nested structure as illustrated in Figure 3.1.

Fig 2. Fundamental multi-level conceptual framework of Inclusive development



Note: Own Illustration

The structure of this categorisation is critical as it offers the foundation for the decomposition, allowing us to discern sub-indices contributions (represented by pillars and domains) and individual variables across diverse countries within our study period, facilitating a more comprehensive assessment of a country's overall performance. As illustrated in Figure 3.1, this framework includes four primary pillars, with three corresponding domains (sub-pillars) for each.

The Economic Potential and Progress Pillar:

As we review in the section 2.2, inclusive growth/development concept has different aspects that generally care about how economic growth can translate into inclusion and well-being. In all these definitions, economic growth and its related economic aspects that increase its pace can be seen as a bottom line and a must. So, the Economic Potential and Progress pillar serves as the foundation for evaluating economic performance, both in the present and with an eye

toward the future, with a primary focus on accelerating the pace of economic growth. This pillar is in common with other literature (like the growth and development pillar in the WEF framework in 2018) for creating and expanding economic opportunities as the bedrock for development trajectory. However, the structure of the classification of domains and included variables is still different. This pillar quantifies economic factors across an entire society in an aggregate manner, and It employs pure economic metrics without considering inclusion and inequality aspects.

- Growth performance: This domain covers some part of growth component in the inclusive growth/development concept regarding the pace of growth.
- Employment status: This domain covers some part of participation aspect of inclusive growth/development that maintains a neutral stance regarding the inclusion of various segments and considerations related to inequality.

The Equitable Opportunities and Benefits Pillar

The Equitable Opportunities and Benefits pillar centres on including inclusion and inequality of benefits and opportunities of economic growth, but just in monetary dimensions. Within this pillar, we explore how people are included in both benefits and opportunities of the growth process by including inequality in income-related aspects of the population's well-being. Including this category based on "the inequality of benefits and opportunities in income-related aspects" is new in the literature. Other frameworks include different types of inequalities together without any distinction. This distinction is critical as different types of inequalities have different results in the economy.

- Labor market inclusion: This domain is about money-related opportunities and the inclusion of the participation of the population in the growth process. One of the main processes of participation of people is through the job market. This dimension seeks to ensure equitable employment opportunities for diverse segments of society, including women, mothers, migrants, and youth. Including this domain separately is crucial because, for achieving inclusive development, more than the mere existence of employment opportunities is needed. High-quality employment, referred to as “Decent jobs,” is pivotal in advancing inclusive growth, as they serve as more than just sources of income. They empower individuals to improve their living standards and break free from the cycle of poverty. Expanding job inclusion and enabling a broader population segment to engage in high-productivity roles is imperative. Regarding access to the job market, various inequalities can persist in this domain, like gender disparities in payment and employment ratios, particularly in the informal sector, where many women and children find employment.
- Monetary inequality: This domain represents the inclusion and inequality of money-related benefits of the growth process. It is aligned with other frameworks in the literature, although without this distinct classification. It consists of income and wealth inequalities and can also include poverty alleviation. Including wealth inequality is critical as income and wealth inequality patterns can be so different.

The Social inclusiveness and mobility pillar:

The social inclusiveness and mobility pillar is designed to include the non-income inequalities dimension of the inclusive development concept. It ensures that the entire population,

particularly marginalized and disadvantaged groups such as women and youth, can access various social opportunities and benefits for enhancing equity. It primarily concentrates on human development, extending beyond mere economic metrics. Within this domain, the Empowerment and Social infrastructure pillars are aligned with the human development concept in the HDI index of UNDP. However, this categorization is unique and different from HDI, as empowerment has a broader meaning than just knowledge, emphasizing social mobility. We differentiate these two domains as they have distinct impacts: Empowerment is the inclusion (distribution) part of social dimensions, and social infrastructure is more about the aggregate status of providing social foundations.

- Empowerment: Its core objective is to empower a broad cross-section of society by providing them access to diverse social benefits and opportunities, enabling active engagement in economic, social, and political processes. Education-related indicators are included here as one of the essential forms of intergenerational upward mobility (Like the quality of education rather than just quantity or different types of gender empowerment).
- Social infrastructure: This domain is also aligned with other literature emphasising the importance of enhancing human capabilities and development, but unlike the empowerment domain, this domain is more about creating physical foundation for improving social aspects of people's life (like physical and organizational structures necessary to deliver healthcare services). The variables related to this domain can includes healthcare resources, among others. In essence, social infrastructure has the potential to expedite economic growth and enhance the socio-economic well-being of individuals. For instance, healthcare assumes paramount significance as they play a pivotal role in expanding the foundation for future growth and fostering the happiness and well-being of the population. Consequently, it underscores the imperative of affording all members of society the means to cultivate fundamental human capabilities, which serve as a cornerstone for achieving social inclusion.

The Environmental sustainability Pillar:

As we explain in detail in Chapter 2, and as shown in figure 1 in this chapter, the environmental aspect is underrepresented in inclusive growth/development frameworks and definitions. Nowadays, the world confronts escalating environmental challenges that have repercussions for human well-being and economic stability. These challenges encompass issues such as climate change and air pollution. To illustrate, consider the economic toll of weather-related disasters, which reached approximately USD 470 billion in 2017. Projections indicate a significant upward trend in these numbers in the coming years (Giuzio et al., 2019). Besides, elevated levels of air pollution constitute a substantial risk to human well-being, contributing to the annual occurrence of 7 million fatalities, which equates to one out of every eight deaths globally (WHO, 2018). Considering these factors and acknowledging how critical environmental services are in meeting the requirements of marginalized populations, along with the fact that these individuals endure the most significant impacts of environmental crises (Gupta et al., 2015), We incorporate environmental sustainability into our framework through specific sub-categorizations designed to assess various environmental aspects in pursuit of inclusive development.

- The environmental performance: The domain of environmental performance is designed to gauge environmental externalities and assess the extent of environmental current problems and their different impacts in countries.
- The environmental resources and productivity: This domain is centred on measuring how much the economies are resource-efficient and low-carbon. High productivity of resources is anticipated to yield multiple benefits, including reducing CO2 emissions, cultivating a cleaner environment, mitigating climate change, enhancing economic competitiveness, and bolstering energy security. Moreover, assessing resource utilization, including factors like water consumption and the current state of environmental resources, holds paramount importance. These natural assets are the bedrock upon which the foundation of economic development is built.

Lastly, it is crucial to emphasize the interconnectedness of all the pillars, as they collectively influence the pace and process of the growth. 1 While it is true that inevitable trade-offs exist among these pillars, there are also opportunities for mutually beneficial outcomes like enhancing the skills of children from low-income families.

3.2. Construction of the non-compensatory inclusive development index:

We explore inclusive development phenomena and how its sub-indices interact based on our enhanced framework for 38 OECD countries 2001 to 2019. This time period facilitates the examination of relative measures over a more extensive historical period across all sampled countries. It also represents a recent and substantial duration that helps mitigate the impact of abnormal or short-term fluctuations. Additionally, it permits an analysis of the inclusive development trends preceding and following the Great Recession.

The foundational step in creating any index is establishing a robust theoretical framework that precisely defines the phenomenon to be measured. This critical choice acts as the cornerstone for the meticulous selection and skilful integration of variables, forming a coherent composite index. We complete this step in section 3.1. now we detail our index construction methodology, illustrating how our index offers improvements through carefully chosen variables, a superior construction setting, and an extended time period.

3.2.1 Selected variables and statistical processes

In this paper, the selection criteria of variables is guided by our theoretical framework and the unique circumstances and income levels of OECD countries. We intentionally restrict the number of variables included, even though there is often a natural inclination to include a broad and diverse array of variables in such endeavours. We assert that our chosen variables better align with the intended definition of the inclusive development index meaning that for each variable there is a clear effect (negative or positive) between, and different dimensions of inclusive development performance based on the existing research and making informed judgments based on past experiences. Also, we did not include any input measures e.g., expenditures unlike some existed variables. The variables selected for each pillar do not comprehensively cover every aspect of that specific pillar. Instead, they represent a strategic choice designed to capture the essential elements of that pillar effectively.

In Table 3.1, pillars, domains, selected variables, and their effects on inclusive development phenomena are represented. The signs of the effect of the variables on inclusive development are determined based on the general characteristics of our studied phenomena, data

interpretation, historical experience, and existing literature The ultimate selection of 18 variables is made after thoroughly evaluating a larger pool of 96 potential variables[1] initially identified based on their capacity to represent various aspects of the pillars outlined in our enhanced framework. Also, as missing data can significantly impede the development of a robust composite index our approach involves deliberately incorporating a diverse range of data sources while excluding variables with limited coverage to minimize the occurrence of missing values, obviating the need for extensive employment of diverse imputation methods. So in our paper missing values are at most 10%). [2] we also performed a rolling correlation analysis and omitted highly correlated variables within pillars.

Table 3 The Structure of Inclusive Development Index

Level 0	Level 1 (Pillars/Sub-indexes)	Level 2 (Domains)	Level 3 (Variables)	Effect of variables on IDI
Inclusive development index (IDI)	**Economic potential & progress (EPP)**	Growth performance	GDP per capita	+
			Total Wealth per adult	+
		Employment status	Employment to population ratio	+
			Vulnerable employment	-
	Equitable opportunities & benefits (EOB)	Labour market inclusion	Gender gap in the employment ratio	-
			Youth unemployment rate	-
		Monetary inequality	S80/20 share of income (ratio)	-
			Median wealth per adult	+
	Social Inclusiveness & mobility (SIM)	Empowerment	Mean years of schooling	+
			Expected years of schooling	+
			Women in national parliaments	+
		Social infrastructure	Life expectancy at birth	+
			Maternal mortality	-
			Child vaccination rates	+
	Environmental sustainability (ES)	Environmental performance	Mortality from exposure to ambient PM2.5	-
			CO2 emissions	-
		Environmental resources	Energy productivity	+
			Renewable energy supply	+

Source: Own analysis.

Normalization of data

Normalization is a crucial step before data aggregation, ensuring comparability across indicators with different measurement units. It also guarantees that higher normalized values reflect better performance in the composite index. This paper applies Min-Max normalization, adapted to the dataset's characteristics.[3]

1 - Compiling this extensive list involved a combination of existing knowledge and an exploratory investigation of official data sources

2 - We addressed missing data within the middle of the series using the moving average method, and for missing values occurring at the end of our series, we employed the Last Observation Carried Forward (LOCF) method

3 - This is the most widely employed normalization method in the inclusive development literature like The HDI and IDI (of the WEF) and IGG of ADB. However, as previously mentioned, the HDI and the IDI from the WEF utilize upper and lower thresholds instead of the minimum and maximum values of the dataset.

$$N_q = \frac{x_{iq}^t - min_i(x_q^t)}{[max_i(x_q^t) - min_i(x_q^t)]} \quad (1)$$

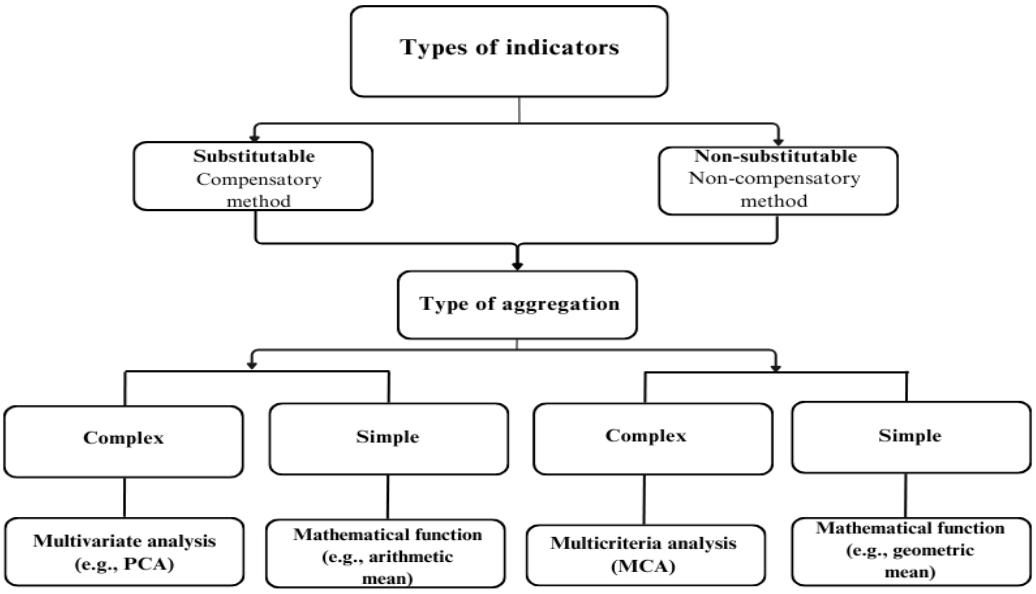
$$N_q = \frac{max_i(x_q^t) - x_q^t}{[max_i(x_q^t) - min_i(x_q^t)]} \quad (2)$$

For each year (t), x^t_{iq} represents the value of variable q for country i. The terms $max_i(x^t_q)$ and $min_i(x^t_q)$ denote the highest and lowest values observed across all countries in the sample at time t. A score of 0 indicates the lowest performance, while 1 represents the highest. For variables where higher values are undesirable, the second equation is applied to maintain consistent scaling, ensuring that 0 and 1 always reflect the least and most favourable outcomes, respectively. These scores capture the relative gap between a country's performance and that of the best- and worst-performing nations in a given year.

A new method for aggregation:

The aggregation techniques employed in existing wellbeing indices, including Principal Component Analysis and additive methods for integrating various variables and dimensions, present both practical and theoretical challenges that must be addressed through appropriate methodological approaches (see, for example, Greco et al., 2019; Mazziotta & Pareto, 2019). As suggested by Mazziotta and Pareto (2016, 2013), a fundamental criterion for selecting an appropriate aggregation method is the degree of compensability or substitutability among the variables. When variables are substitutable, a compensatory approach, such as the arithmetic mean, is suitable. However, for non-substitutable variables, a non-compensatory method, such as the geometric mean, should be employed.[1] While the issue of substitution between dimensions has gained increasing attention in the literature (Anand & Sen, 2003; UNDP, 2010), there is still no agreement on the optimal approach for incorporating multiple dimensions with complex interdependencies and complementarities into a single development indicator.

Fig 3: Guideline for choosing aggregation method



[1] - It is important to note that in both linear and non linear aggregations, the weights represent trade-offs rather than serving as coefficients of importance.

Note: Adapted from Mazziotta & Pareto (2013, 2016)

The arithmetic mean, as utilized by the WEF in their Inclusive Development Index (IDI) and the Asian Development Bank in the Inclusive Green Growth Index, does not consider variations in achievements both within and across dimensions. This approach inherently assumes perfect substitution among all indicators within each pillar (sub-indices) and across different pillars. Meanwhile, the geometric mean used in the current HDI does account for substitution between dimensions; however, it lacks the flexibility needed for broad applicability across different contexts.

To manage these challenges, the allowance for the heterogeneity of dimensions and their inter-connection, we follow the new aggregation method developed by Mauro et al. (2018) and . The standard formula, applied to a data matrix with n observations and k variables, is structured as follows: $MSI_i = 1 - \left[\frac{1}{k}\sum_{j=1}^{k}(1 - x_{ij})^{g(x_i)}\right]^{\frac{1}{g(x_i)}}$

A generic option for the function $g(x_i)$ could be: $g(x_i) = \begin{cases} \frac{b}{a} & if\ \mu < a \\ \frac{b}{\mu}\ if\ a \leq \mu < b \\ 1 & if\ \mu \geq b \end{cases}$

Where:

- $g(x_i)$ represents a function applied to the i-th row of the matrix, with $g(\cdot)>1$ and j indicating the dimensions.
- a and b are two selected thresholds ($0<a<b<1$) that determine how achievements are aggregated. Any unit surpassing b or dropping below a is combined under the assumption of an almost perfect (or complementary) substitution rate.

The function g(xi) allows for varying degrees of substitution for each unit, providing greater control over theoretical considerations of substitution rates between achievements. Table … highlights the differences in managing the substitutability of variables or dimensions among the arithmetic mean, geometric mean, and MSI.

Table 4: Comparison among different aggregation methods

	Arithmetic mean	Geometric mean	MSI
Substitutability	Perfect	Not perfect	Not perfect
MRS flexibility *	None	Limited	High
Reward synergies	No	Yes	Yes

Source: Biggeri et al. (2019)

Note: * MRS flexibility represents the theoretical rate at which a country is willing to exchange achievement in one dimension for progress in another while keeping the overall index score unchanged.

we follow Biggeri et al. (2019) for additional assumptions regarding $g(x_i)$. Accordingly, our thresholds a and b are set to 0 and 1, respectively, where μ is the simple average of dimensions or variables in each dimension, and $g(x_i) = \frac{1}{\mu}$. Our enhanced inclusive development index (EIDI) consist of four pillars (n=4) for each country I and is defined as follows:

$$EIDI_i = 1 - \left[\frac{1}{n}\sum_{j=1}^{n}(1 - x_{ij})^{\frac{1}{\mu}}\right]^{\mu_j}$$

We also used this formula to aggregate the variables within each pillar, where n denotes the number of variables in each pillar (dimension), and μ represents their average. With this new approach, our EIDI remains robust even when certain dimensions score zero (or near zero), unlike the geometric mean. Additionally, it mitigates the unrealistic assumption of perfect substitution between dimensions and variables. The final step in constructing the EIDI is evaluating its robustness. To test the robustness of our index, we conduct two simulations—one using the geometric mean and the other using the arithmetic mean—both across and within the four main pillars, in addition to our EIDI.

4. Results

This section presents the key findings and analysis derived from the Enhanced Inclusive Development scores and rankings across 38 OECD countries from 2001 to 2019 Figures 4 represents the OECD average of the Inclusive Development Index compared to the GDP growth rate. This figure highlights the most important findings of this paper. It reveals that the EIDI often exhibits opposing shifts compared to GDP growth. Notably, in 2015, which had the lowest average IDI score during our study period, GDP growth was positive at 2.6 percent. While the GDP growth rate was negative and near zero in 2009 (-4.8%) and in 2008 (+0.3) during financial crises -altough with a decreasing trend over many other years- the Inclusive Development Index experience declines in many years from 2001 to 2019, including 2002 (-4.8%), 2004 (-3.1%), 2005 (-0.6%), 2006 (-1.1%), 2009 (-3.2%), 2011 (-1.7%), 2012 (-1.6%), 2014 (-3.9%), 2015 (-6.6%), and 2018 (-3.7%). This divergence in IDI trend from GDP growth rate highlights the unique nature of the Inclusive Development Index. Despite a significant 30.9 percent increase in the average GDP per capita from 2001 to 2019, the Inclusive Development Index in 2019 failed to reach its 2001 level, experiencing a 1.9 percent decrease. This stark contrast underscores that GDP growth rate alone cannot reflect a more inclusive development model encompassing economic, social, and environmental dimensions of progress.

Fig 4: Enhanced Inclusive development index vs growth rate of GDP per capita (2001-2019)

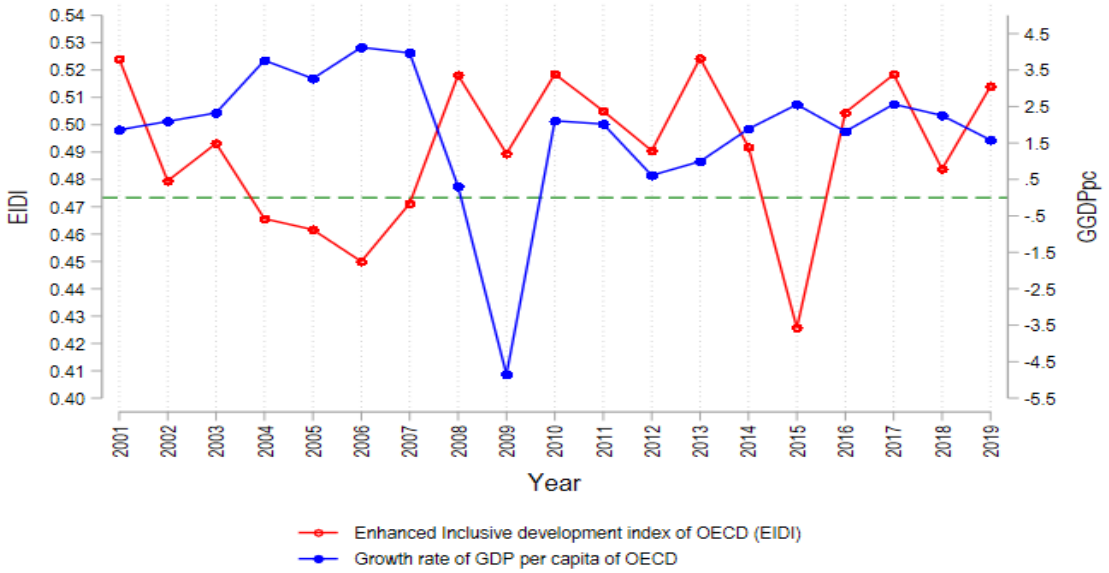
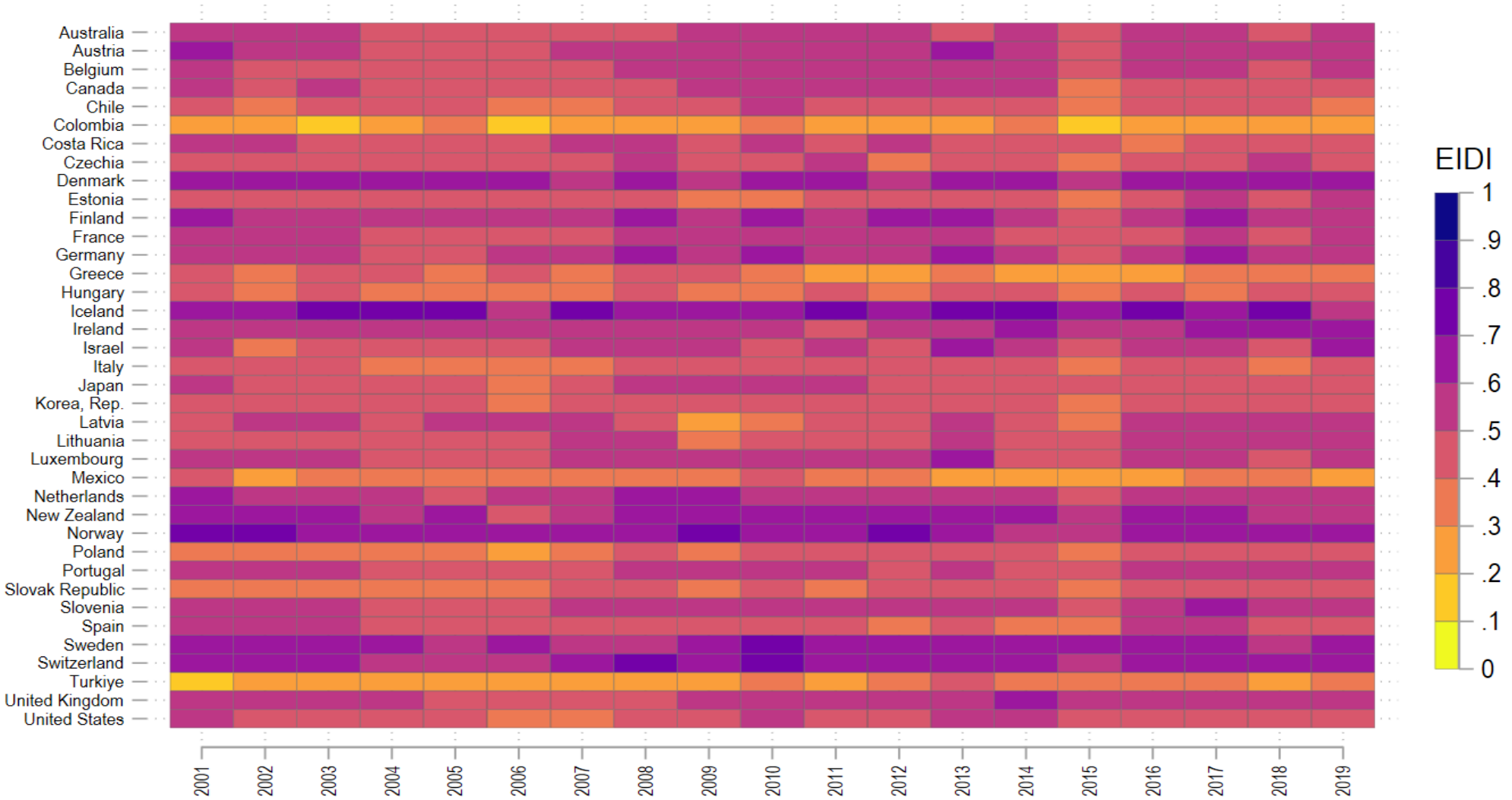

0.54
0.53
0.52
0.51
0.50
0.49
0.48
0.47
0.46
0.45
0.44
0.43
0.42
0.41
0.40
EIDI
4.5
3.5
2.5
1.5
.5
-.5
-1.5
-2.5
-3.5
-4.5
-5.5
GGDPpc
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Year
Enhanced Inclusive development index of OECD (EIDI)
Growth rate of GDP per capita of OECD

Fig 6: Overall EIDI Rankings in 2001-201

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Switzerland	4	6	6	6	6	4	3	1	2	1	4	3	2	4	4	4	6	3	1
Denmark	5	4	5	4	4	1	11	5	8	6	5	7	3	3	6	3	1	4	2
Sweden	2	2	2	3	5	3	8	10	3	2	6	4	4	6	2	6	4	7	3
Ireland	14	10	7	7	7	7	9	16	20	22	22	15	14	5	3	8	3	2	4
Norway	1	1	4	2	2	2	2	2	1	3	3	1	7	8	5	2	5	5	5
Israel	20	33	22	26	27	24	17	20	7	25	12	20	6	9	14	13	15	19	6
Iceland	3	3	1	1	1	5	1	6	4	5	1	2	1	1	1	1	2	1	7
United Kingdom	13	13	12	10	12	19	24	25	13	12	11	11	12	7	7	18	11	13	8
Slovenia	19	14	14	12	22	12	14	11	19	19	21	19	18	17	16	12	8	14	9
Netherlands	7	8	10	9	11	8	7	3	6	10	10	10	13	12	10	9	13	8	10
Portugal	11	12	19	17	29	18	20	13	12	20	19	24	16	21	18	11	14	16	11
New Zealand	6	5	3	5	3	16	5	8	5	4	2	5	5	2	8	5	9	6	12
Finland	8	11	11	8	8	9	4	4	14	8	7	6	10	14	9	14	7	9	13
Germany	10	17	13	19	20	10	6	7	9	7	9	9	11	10	12	10	10	10	14
Estonia	30	27	27	31	21	15	25	35	34	34	27	25	24	27	27	26	20	21	15
Austria	9	7	9	11	13	11	13	9	11	13	8	8	8	11	15	17	12	12	16
Lithuania	29	23	24	20	15	13	10	21	33	30	28	22	19	20	21	15	16	17	17
Luxembourg	12	9	17	16	26	14	15	15	15	14	18	14	9	19	13	7	22	23	18
Belgium	23	24	23	21	28	23	22	18	16	17	14	13	15	15	19	20	19	18	19
France	16	20	16	13	24	21	23	17	18	16	16	16	17	23	20	23	18	20	20
Latvia	27	16	20	14	9	6	12	29	36	35	25	27	22	31	30	19	17	11	21
Australia	15	15	8	15	19	22	18	23	10	11	20	12	23	13	23	16	23	27	22
United States	22	26	25	23	14	32	31	26	23	21	24	21	21	16	22	25	30	26	23
Spain	17	18	18	18	16	17	21	22	24	27	26	34	31	34	26	21	21	24	24
Japan	21	22	21	29	17	28	29	12	21	9	13	26	28	26	17	22	25	22	25
Canada	18	21	15	22	10	26	19	24	17	15	17	17	20	18	31	27	27	33	26
Costa Rica	24	19	31	24	18	20	16	14	22	18	29	18	27	29	11	34	32	31	27
Czechia	26	29	29	25	30	27	27	19	29	24	15	33	30	24	25	24	26	15	28
Slovak Republic	36	32	34	34	37	31	26	31	30	32	34	31	32	32	32	30	31	32	29
Poland	35	35	35	35	34	36	30	32	31	28	32	30	29	28	29	29	24	28	30
Korea, Rep.	25	25	28	27	23	33	28	28	26	26	30	23	25	22	28	28	28	30	31
Hungary	28	31	33	32	31	34	34	34	35	33	33	35	34	30	33	32	34	29	32
Italy	31	28	30	33	33	29	32	30	25	29	31	29	33	33	34	33	29	34	33
Chile	32	34	32	28	25	30	33	27	28	23	23	28	26	25	24	31	33	25	34
Greece	33	30	26	30	35	25	36	33	27	37	38	38	36	38	37	37	35	35	35
Turkiye	38	37	37	38	38	37	38	38	38	38	36	36	35	36	35	35	37	38	36
Mexico	34	36	36	36	32	35	35	36	32	31	35	32	37	37	36	36	36	36	37
Colombia	37	38	38	37	36	38	37	37	37	36	37	37	38	35	38	38	38	37	38

Fig 7: Enhanced Inclusive Development Index scores in 2001-2019

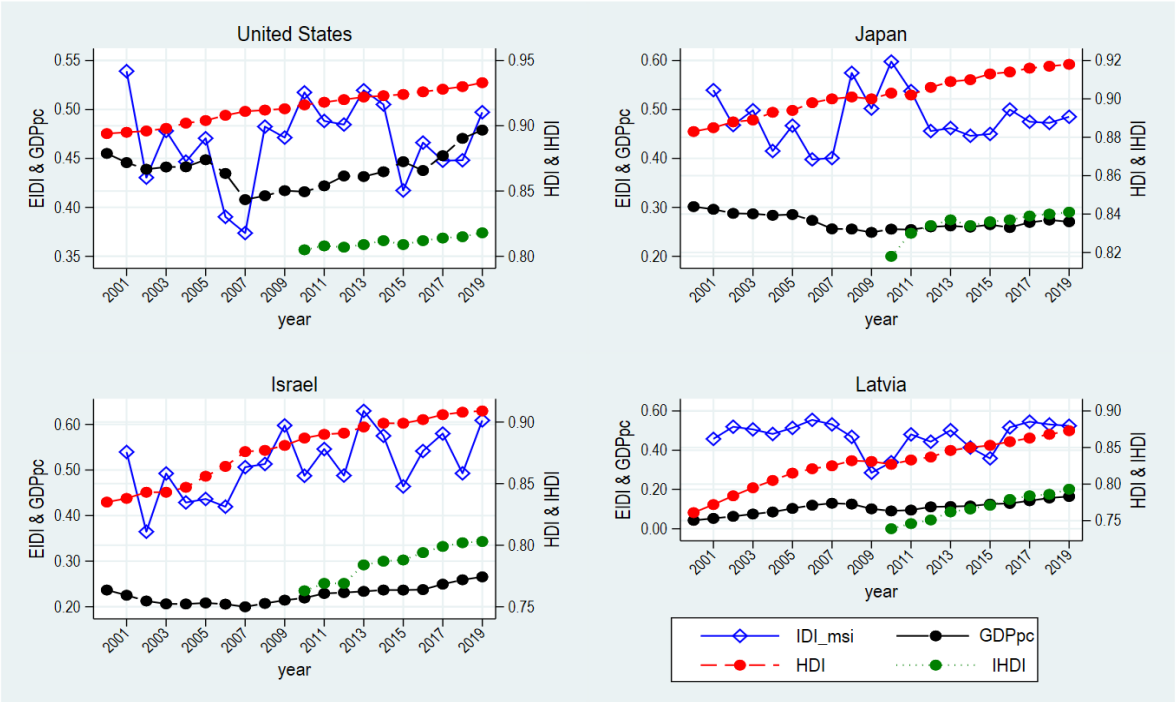


Source: Own calculation.

Fig 6 and 7 provide an overview of countries' performance based on their Inclusive Development scores and rankings, measured on a scale ranging from 1 to 38. A ranking of 1 means a country with the highest Inclusive Development performance in a given year. In contrast, a ranking of 38 reflects the lowest score or a country with the least inclusive development performance for that year. Based on Fig 6, it is evident that many leading performers consistently held a top ten ranking since 2001.

Figure 5 highlights two key insights. First, the EIDI captures distinct information compared to the HDI and GDP per capita, as evidenced by its significantly different behaviour. Unlike the HDI and IHDI, the EIDI incorporates additional data across four pillars and does not exhibit a consistent upward trend across all selected countries. Second, the EIDI is particularly useful for identifying long-term development patterns, unlike the WEF's IDI, which was excluded from this graph due to data availability being limited.

Fig 8: Comparison of EIDI to HDI, IHDI, IDI and GDP for selected countries



Figures 9 to 12 present the four sub-indices (pillars) that facilitate a detailed analysis of various aspects of the Inclusive Development Concept, offering a deeper understanding of their individual and collective contributions to the Inclusive Development Index captured in this study. Figure 9 specifically illustrates changes in Economic Potential & Progress (EPP) pillar scores across OECD countries between 2001 and 2019.The results align with expectations regarding GDP growth rates, with lower growth observed in more developed economies such as Norway, Iceland, and New Zealand. Given the comparative nature of these values, some degree of convergence can be observed within this pillar. Notably, Lithuania, Hungary, and Latvia exhibit significant improvements in both their absolute scores and relative rankings. Meanwhile, Turkey demonstrates a marked improvement in its 2019 score, despite remaining near the lower end of the distribution. Conversely, lower-performing economies such as Greece and Chile display a downward trend, ranking at the bottom of the distribution in both years and experiencing further decline in 2019 compared to 2001.

Fig 9: Changes in Economic Potential & Progress Pillar Scores in OECD Countries (2001–2019)

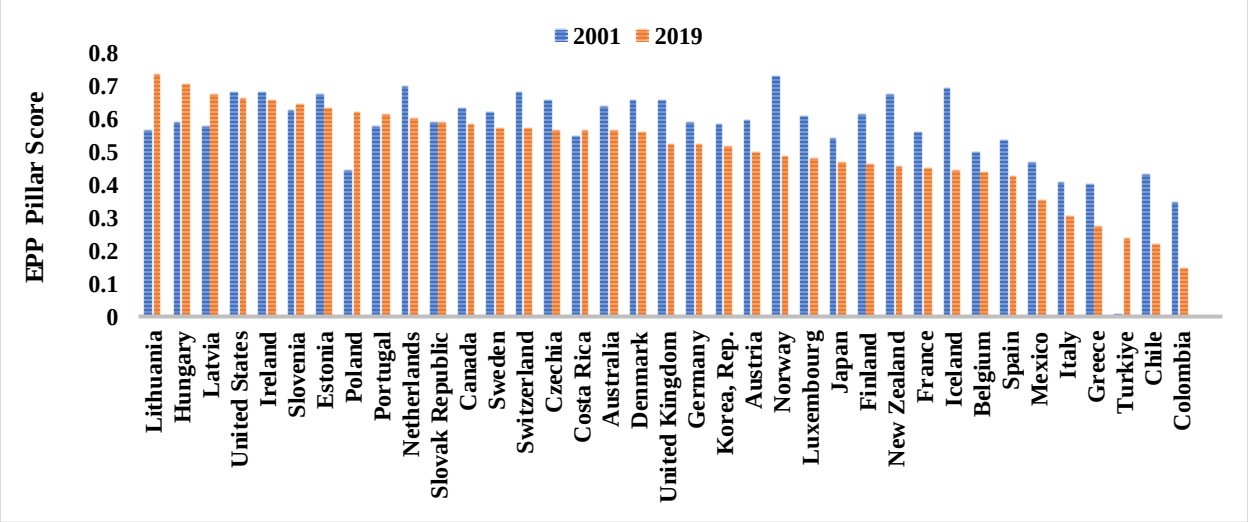


Figure 10 illustrates the changes in Equitable Opportunities & Benefits (EOB) pillar scores across OECD countries between 2001 and 2019. The findings reveal that changes in EOB scores is minimal for most OECD countries, indicating limited progress in this pillar. The highest-ranking countries are predominantly Scandinavian developed economies, including Denmark, Switzerland, and the Netherlands, while Slovenia stands out as the top performer in 2019. At the lower end of the distribution, Chile, Turkey, and Mexico show slight improvements compared to 2001, whereas Greece, Spain, Italy, and Colombia experience stagnation or decline. Additionally, while the United States ranks among the top performers in the Economic Potential & Progress (EPP) pillar, it is positioned in the lower two-thirds of the distribution in the EOB pillar.

Fig 10: Changes in Equitable Opportunities & Benefits Pillar Scores in OECD Countries (2001 – 2019)

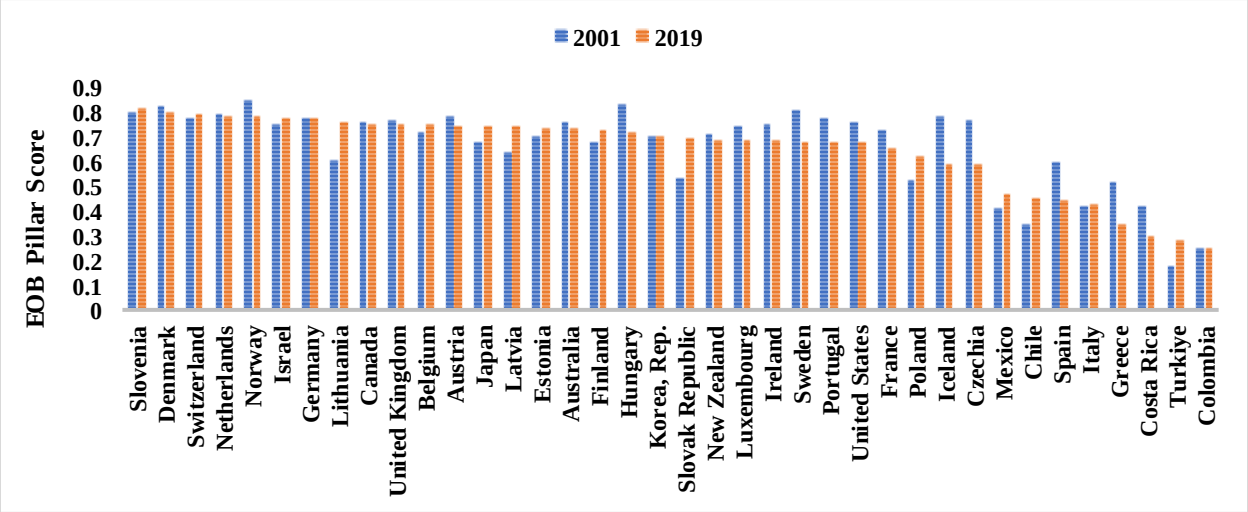
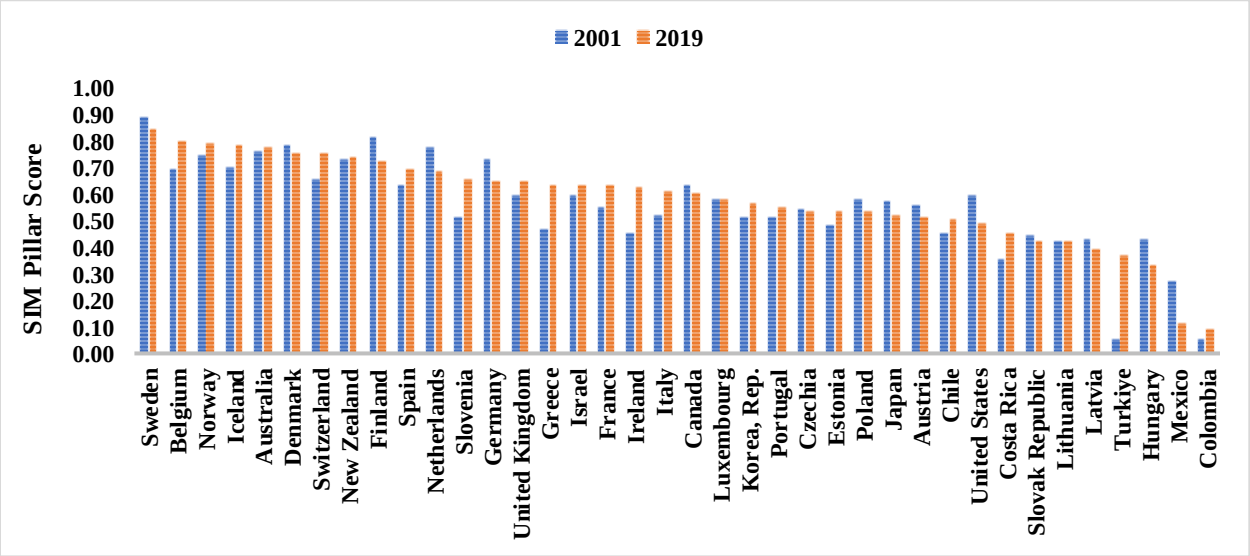


Figure 11 presents the changes in Social Inclusiveness Pillar scores across OECD countries between 2001 and 2019. The results indicate that 21 out of 38 OECD countries improved their scores in this pillar in 2019 compared to 2001. A key observation is that countries such as Estonia, Lithuania, and Latvia, which demonstrate significant improvements in the Economic

Potential & Progress (EPP) pillar and overall Inclusive Economic Development Index (EIDI), do not exhibit similar progress in the Social Inclusiveness pillar, with their scores remaining the same or declining. Similar to trends observe in Equitable Opportunities & Benefits (EOB) scores, Turkey experience the largest improvement in this pillar.

Fig 11: Changes in Social Inclusiveness Pillar Scores in OECD Countries (2001–2019)



As shown in Fig 12, unlike the previous pillars, the top performers in this category include a more diverse set of countries, such as Costa Rica and Colombia, alongside Scandinavian developed nations. In contrast, several high-income countries, including Australia, South Korea, and the United States, are positioned at the lower end of the distribution. Over this period, significant variations—both positive and negative—are observed in country scores. 22 out of 38 countries, including Ireland, Denmark, and the United Kingdom, demonstrated either improvements or stagnation, while others, such as Mexico, Turkey, Canada, and Japan, recorded declines in their scores in 2019 compared to 2001.

Fig 12: Changes in Environmental Sustainability Pillar Scores in OECD Countries (2001–2019)

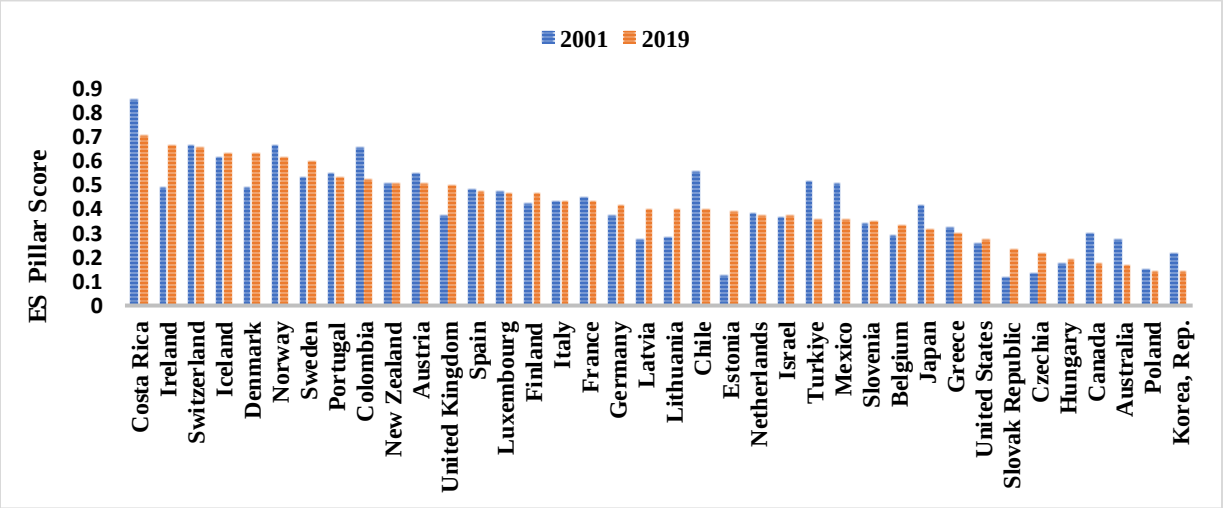
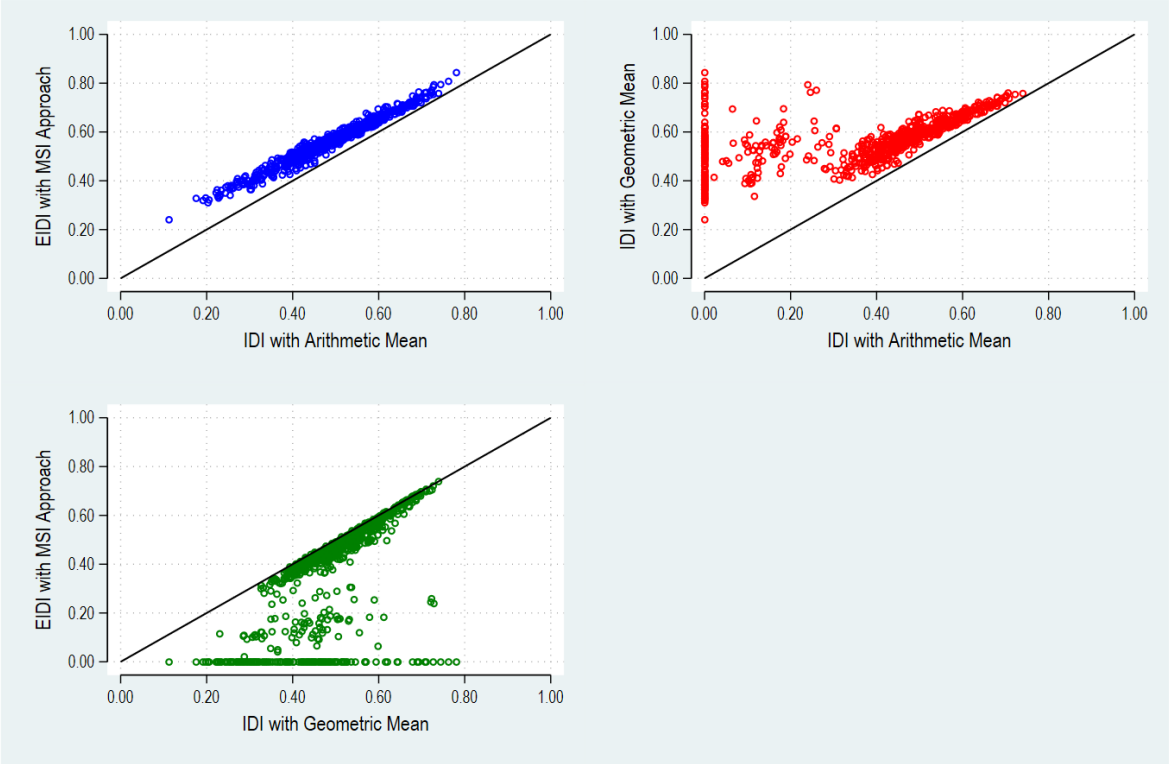


Figure 6 presents a comparative analysis of the Inclusive Development Index (IDI) under three distinct aggregation methodologies: the arithmetic mean, the geometric mean, and the MSI-based approach employed in the construction of the Enhanced Inclusive Development Index (EIDI). This comparison elucidates the extent to which aggregation techniques influence the resultant index values. Each data point in the figure corresponds to country-year observations. The findings indicate that the MSI-based method offers a more robust representation of heterogeneity across dimensions without unduly penalizing countries exhibiting lower performance levels. In contrast, the geometric mean, while commonly used for its multiplicative properties, exhibits a notable drawback—it can yield values approaching zero when any constituent variable assumes an extremely low magnitude. This phenomenon is particularly problematic in multidimensional indices comprising numerous indicators, as it amplifies the risk of the overall composite score collapsing to zero, thereby distorting cross-country comparisons.



5. Final remarks:

In 2022, the World Bank classified all 38 OECD members as advanced or higher-income countries. Despite this recognition, significant disparities persist within these nations. This study underscores the imperative of placing societal well-being at the forefront of new socioeconomic and developmental policies. By implementing the inclusive development concept, we provide a more comprehensive understanding of OECD countries' developmental performance. This study presents some contributions on multiple fronts. Firstly, we introduce a refined, inclusive development framework characterized by four primary pillars to enhance existing inclusive growth/development models. Our framework is versatile and designed to be applicable across diverse scales and countries, irrespective of their varying levels of

development. Secondly, grounded in this theoretical framework, we construct a composite index featuring four sub-indices, incorporating a more suitable and comparable set of variables (18 in total) and an improved construction setting compared to existing indices. We provide a long view of inclusive development performance and sub-indices by applying our index to 38 OECD countries from 2001 to 2019. This longitudinal analysis offers a more extended perspective at a national level, enabling a more accurate basis for comparing countries than previous efforts. Our results shed light on how growth translates into inclusion, equity, and environmental sustainability. In subsequent studies, identifying homogenous country groups and determinants of inclusive development performance in OECD countries will yield valuable insights. This will facilitate a more nuanced segmentation of countries and a deeper understanding of the key factors influencing their positions in the overall inclusive development ranking and sub-indices. Our results show stark differences in the inclusive development index and sub-indices in the whole sample. In 2019, Switzerland achieved the highest inclusive development score at 5.32, while Colombia attained the lowest at 2.82. Switzerland consistently ranks 1 and 6 among the 38 OECD countries throughout the period. Conversely, Colombia consistently occupies the bottom of the ranking list, ranging between 34 and 38 out of the 38 countries. In general, over the nineteen years, OECD countries could not significantly alter their relative positions in the Inclusive Development Index compared to their peers.

Switzerland, Sweden, Denmark, Norway, Iceland, and New Zealand consistently secured positions within the top 10 of the Inclusive Development Index throughout the entire period. The trend indicates that countries with high GDP per capita are often at the forefront of the Inclusive Development Index, with nations with lower per capita GDP tend to occupy lower positions in the IDI rankings, underscoring the correlation between economic strength and better inclusivity, equity, and sustainability. However, in several instances, top performers in the Inclusive Development Index (IDI) exhibit lower rankings in terms of GDP per capita, supporting the notion that exclusively relying on GDP for monitoring a country's progress may downgrade the rank of nations prioritizing inclusive development and the well-being of their citizens. For example, among the mentioned top 10 in the IDI, New Zealand, Sweden, and Iceland are not within the top 10 of GDP per capita ranking throughout the entire period; instead, they obtain positions between 18th and 21st, 10th and 14th, and 6th and 12th, respectively.

The results also substantiate this claim that high GDP per capita does not necessarily guarantee higher inclusive development. By way of illustration, consider the case of the United States. From 2001 to 2019, despite consistently ranking 4th or 5th in GDP per capita, its position in the overall Inclusive Development Index ranges between 18th and 28th. When examining the four sub-indices of the IDI in 2019, the United States ranks 4th for the Economic Potential and Progress pillar, 27th for Equitable Opportunities and Benefits, 30th for Social Inclusiveness and Mobility, and 30th for the Environmental Sustainability pillar. Similar patterns are observed in other countries such as South Korea, Japan, Luxemburg, Canada, and Australia, where their rankings in the Inclusive Development Index or its sub-indices are notably lower than their GDP per capita rankings.

Comparing the results of this study for 2018 with those published by WEF, we can see some similarities that validate our overall claim of the need to focus on socioeconomic development instead of solely focusing on GDP. However, specific differences exist that are mainly rooted in differences in the refinements of our framework, variables, and methodology. Besides, despite HDI's limitations in capturing only certain aspects of human development, comparing HDI results for OECD countries in 2019 yields similar findings. For instance, similar to our Inclusive development index, Switzerland secured the top rank in the HDI in 2019. Also, while Luxembourg and the United States ranked 1st and 5th in GDP per capita levels, they attained the 16th and 15th positions in HDI.

Examining the OECD average for the Inclusive Development Index reveals a lack of improvement in the overall performance of OECD countries and a decline in the score comparing the years 2001 and 2019. These findings support the main ideas of inclusive growth/development for the pattern and quality of growth besides its quantity.

Funding Statement: This research was conducted without financial support from any public, commercial, or non-profit funding agencies.

Competing Interest Statement: The authors affirm that they have no known financial interests or personal relationships that could have influenced the findings of this study.

Appendix

Table 5: Changes of EIDI scores and ranks between 2001 and 2019

Rank 2019	Economy	EIDI Score 2019	Diff. from 2001		
			Rank[1]	Score	
				Abs[2]	%
1	Switzerland	0.69	-3	0.001	-0.15
2	Denmark	0.68	-3	0.005	0.72
3	Sweden	0.66	1	0.032	-4.68
5	Ireland	0.65	-10	0.077	13.35
4	Norway	0.65	4	0.087	-11.75
8	Israel	0.61	-14	0.069	12.86
6	Iceland	0.60	4	0.091	-13.18
7	United Kingdom	0.59	-5	0.016	2.76
9	Slovenia	0.59	-10	0.048	8.82
10	Netherlands	0.59	3	0.048	-7.46
11	Portugal	0.59	0	0.005	-0.88
12	New Zealand	0.58	6	0.062	-9.62
13	Finland	0.58	5	0.037	-6.05
14	Germany	0.57	4	0.024	-3.97
16	Estonia	0.56	-15	0.112	25.34
17	Austria	0.55	7	0.057	-9.35
18	Lithuania	0.55	-12	0.102	22.65
19	Luxembourg	0.54	6	0.047	-8.04
23	Belgium	0.54	-4	0.022	4.30
15	France	0.53	4	0.028	-5.00
22	Latvia	0.52	-6	0.067	14.58
21	Australia	0.51	7	0.065	-11.29
20	United States	0.50	1	0.042	-7.78
24	Spain	0.49	7	0.061	-10.95
25	Japan	0.49	4	0.054	-10.10
27	Canada	0.48	8	0.072	-12.95
26	Costa Rica	0.48	3	0.026	-5.13
28	Czechia	0.45	2	0.018	-3.93
29	Slovak Republic	0.45	-7	0.072	19.20
30	Poland	0.44	-5	0.045	11.43
31	Korea, Rep.	0.43	6	0.036	-7.62
32	Hungary	0.43	4	0.020	-4.34
35	Italy	0.43	2	0.013	-2.87
34	Chile	0.38	2	0.060	-13.81
33	Greece	0.36	2	0.059	-14.13
36	Turkiye	0.30	-2	0.191	170.43
37	Mexico	0.29	3	0.107	-26.65
38	Colombia	0.21	1	0.054	-20.71

Note: 1: A negative value in rank changes indicates an improvement in inclusive development.
2: These values represent the absolute changes in EIDI scores from 2001 to 2019.

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