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Covid-19 and sustainable development in Europe: a temporal comparison

Covid-19 y desarrollo sostenible en Europa: una comparación temporal

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ABSTRACT

Covid-19 has posed major challenges globally. One of these is undoubtedly the achievement of the Sustainable Development Goals (SDGs) of the 2030 Agenda.This study aims to analyze, in a time perspective, the effects of the pandemic on the levels of sustainable development achieved in Europe.
To measure the impact of Covid-19, 3 different sustainability indices (SIs) will be constructed referring to 2015, 2018 and 2020. To construct these indices, 17 indicators (one per SDG) from Eurostat's free database will be used. The Adjusted Mazziotta-Pareto Index (AMPI) method will be used to aggregate these indicators. This method relying on a Min-Max transformation allows for an absolute time comparison. In addition, this method allows for high replicability of results. Furthermore, in order to capture the differences between different European specificities, a hierarchical clustering will be performed according to the Ward method.
The results confirm the negative effects of Covid-19. In fact, there is a general worsening of sustainable development levels between 2015 and 2020.

PALABRAS CLAVE

Desarrollo sostenible
Índice
Covid-19

RESUMEN

Covid-19 ha planteado grandes retos a nivel mundial. Uno de ellos es, sin duda, la consecución de los Objetivos de Desarrollo Sostenible (ODS) de la Agenda 2030.Este estudio pretende analizar, en una perspectiva temporal, los efectos de la pandemia en los niveles de desarrollo sostenible alcanzados en Europa.
Para medir el impacto de Covid-19, se construirán 3 índices de sostenibilidad (IS) diferentes referidos a 2015, 2018 y 2020. Para construir estos índices, se utilizarán 17 indicadores (uno por ODS) de la base de datos gratuita de Eurostat. Se utilizará el método AMPI (Mazziotta y Pareto, 2017) para agregar estos indicadores. Este método se basa en una transformación Min-Max y permite una comparación temporal absoluta. Además, este método permite una alta replicabilidad de los resultados. Además, se realizará una agrupación jerárquica según el método de Ward (1963) para captar las diferencias entre las distintas especificidades europeas.
Los resultados confirman los efectos negativos de Covid-19. De hecho, hay un empeoramiento general de los niveles de desarrollo sostenible entre 2015 y 2020.

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1. INTRODUCTION

The recent Covid-19 pandemic has underscored all the weaknesses of the current development model and highlighted all the criticalities of the globalization phenomenon. The latter phenomenon, globalization, in fact had already shown several criticalities over the years, criticalities that have been exacerbated by the pandemic. In order to understand how the pandemic has affected globalization, it is first necessary to define and analyze this phenomenon. Globalization is defined as a "set of processes that intensify social interdependence" (Steger, 2017). This increasing interdependence has led to the occurrence of numerous effects, both positive and negative. Steger (2017), in fact, classifies the effects of globalization into 4 macro areas: economic, political, cultural, and environmental. Regarding the former, the increasing linkages between countries born with globalization have meant that a crisis born in one country goes to affect other countries more easily bringing disastrous effects especially for small economies. While on the political side, globalization has led to the rise of supra-territorial institutions and associations held together by common norms and interests. Global interdependence has also caused cultural effects including a decrease in the number of languages and the emergence of the so-called "globish," an increase in migration due to high urbanization, and the rise of extremist ideologies easily transmitted through networks created on the Internet. Finally, globalization has caused many devastating environmental effects. It has led to an increase in CO_2 emissions, a gradual and steady rise in temperatures, and the loss of biodiversity.

The cure to all these problems posed by globalization is the phenomenon of sustainable development. Sustainable development is defined as "that development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Sustainable development, born in the second half of the last century, is an extremely complex concept. In fact, it can be defined as a complex system, within which several components or pillars interact. In fact, "sustainable development involves not one but four complex systems. It has to do with a global economy that now encompasses the entire world; it focuses attention on the social interactions of trust, ethics, inequality, and social solidarity networks in the community [...]; it analyzes changes in complex earth systems, such as climate and ecosystems; and it studies governance issues, including the performance of governments and businesses"(Sachs, 2014). From this definition, the 3 dimensions of sustainable development emerge: economic growth, social inclusion and environmental sustainability.

The first dimension, economic growth, covers all those strategies, perfectly coordinated with a country's development needs, aimed at building a strong and competitive economy. The second dimension, on the other hand, concerns all those measures aimed at supporting local communities and improving health, social and cultural well-being. Finally, environmental sustainability is a dimension that cuts across the previous two and concerns the contribution that all of us citizens have to make in protecting and improving the natural environment (Steinbrink, 2019).

In order to better implement the 3 dimensions of sustainable development in 2015, the United Nations promulgated the 2030 Agenda, in which seventeen goals-the so-called Sustainable Development Goals (SDGs)-and one hundred and sixty nine subgoals (targets) were defined. The seventeen goals are as follows: 1. Eradicate poverty; 2. End world hunger; 3. Good health; 4. Quality education; 5. Gender equality; 6. Clean water and sanitation; 7. Renewable energy; 8. Good jobs and economic growth; 9. Innovation and infrastructure; 10. Reduce inequality; 11. Sustainable cities and communities; 12. Responsible consumption; 13. Fighting climate change; 14. Aquatic flora and fauna; 15. Terrestrial flora and fauna; 16. Peace and justice; 17. Partnership for the goals.

These 3 dimensions are in turn based on 3 different pillars: governance, civil society, and stakeholders. Indeed, without effective governance and the contribution of both business and citizens achieving sustainable development is impossible (Sachs, 2014). Figure 1 schematizes the complexity of the sustainable development system. Underlying the system are all those measures, such as the 2030 Agenda, aimed at achieving sustainable development goals. Resting on them are the 3 pillars on which the dimensions of sustainability are based: governance, civil society and stakeholders. Indeed, without a joint effort it becomes difficult to

achieve effective and efficient results. Finally, resting on these 3 pillars are the 3 dimensions of sustainable development analyzed: economic growth, social inclusion and environmental sustainability.

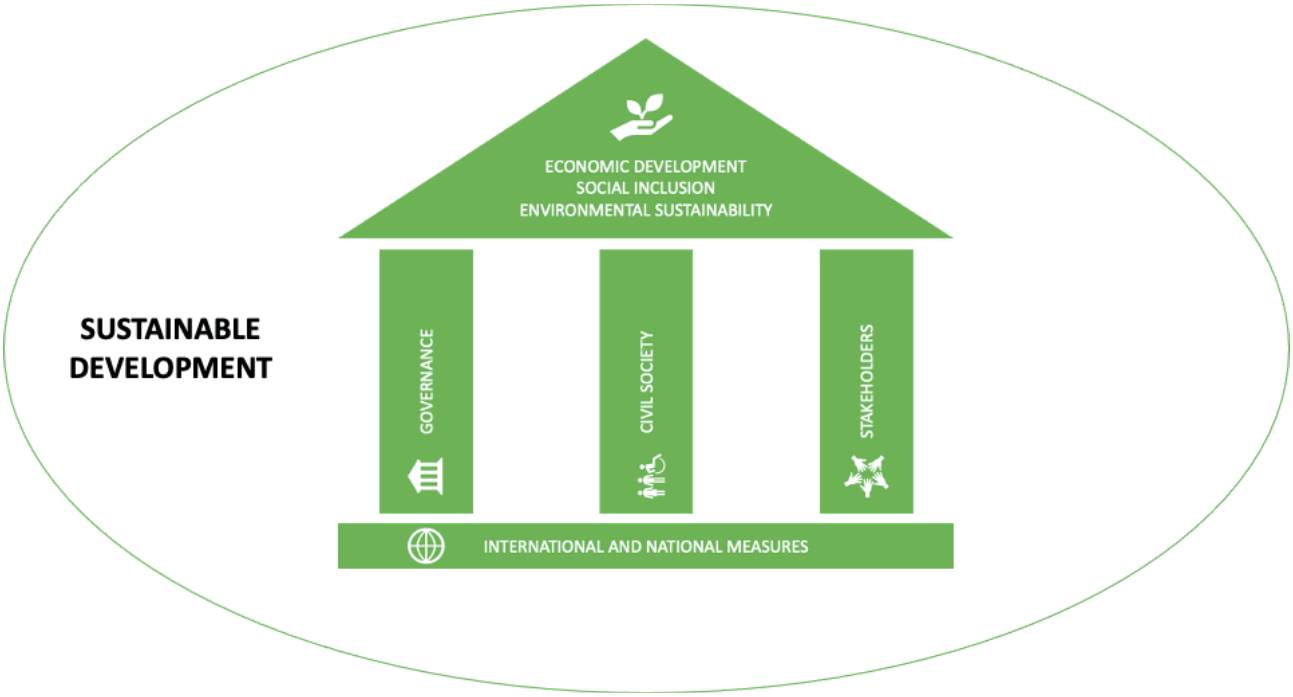

Figure 1. Sustainable development system scheme. Source: Own elaboration.

Along with the three dimensions of sustainable development, the fundamental concept of intragenerational and intergenerational equity emerges in the Brundtland Report (Giovannini, 2018). The latter is defined as the moral duty of current generations to ensure equal growth opportunities for future generations. Therefore, each generation must conserve and maintain biodiversity, preserve the quality of the planet, and ensure access to a wealth of natural and cultural resources in a way that guarantees freedom of choice for future generations. The concept of intragenerational equity, on the other hand, aims to ensure that all people of the same generation have the same opportunities. This concept is twofold: a) internationality, i.e., ensuring equity between more developed and less developed countries; b) intragenerationality, i.e., the integration of minorities.

We can now proceed to examine whether post-conflict globalization is in all respects classifiable as sustainable. With regard to intragenerational equity, it has been empirically demonstrated how there is a positive correlation between globalization and inequality. In fact, as globalization has increased over the past half century, distributional and income inequality has increased both within and between countries. This phenomenon has a simple explanation: globalization has a tendency to increase the rate of economic growth of countries, and therefore, as population growth varies more slowly and for exogenous reasons, the rate of growth of per capita income also increases. This only increases inequality since the allocation of resources takes time. This situation can be improved through redistributive interventions (Vercelli, 2003). In fact, in the period of Bretton Woods, thanks to its principles based on the welfare state, the sign of the net effect on disposable income changed sign thereby reducing inequality. In contrast, after the collapse of that system, distributional inequality started to rise again in most OECD countries, including the United Kingdom and the United States. This is due to the sharp increase in the highest incomes and the inability of redistributive policies to respond to the natural tendency of inequality to grow. These implications of globalization have been further explored by Kuznets (1955) and proponents of this strand. Indeed, according to Kuznets, there is an empirical relationship between per capita income and inequality that can be translated as an inverted U-shaped curve.

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As can be easily deduced if such a curve were to be verified at the general level, the globalization process would be sustainable in the long run. This hypothesis was initially confirmed by subsequent studies, but since the dissolution of Bretton Woods, the conditions for this to be valid no longer existed (Vercelli, 2003). Therefore, the current process of globalization cannot be considered sustainable from an intragenerational perspective. On the other hand, as far as intergenerational equity is concerned, there is no doubt that globalization has led to an increase in the production and consumption of products that are highly impactful on the ecological cycle. In addition, this phenomenon has increased the transportation of raw materials and food from one place to another causing the consumption of 0-kilometer products to decrease. As a result, increasing exports have also increased transportation and thus the demand for nonrenewable energy sources that play a key role in the input of pollutants such as CO2. This increasing input of pollutants has only worsened the greenhouse effect and more importantly has been the cause of the decrease in our planet's biodiversity (Sachs, 2014). In addition, the increase in transportation has also increased the likelihood of accidents such as that of British Petroleum in 2010, accidents that, thanks to the spilling of tons of oil into the oceans and thus the ruining of marine ecosystems, demonstrate how globalization is the greatest threat to the environment. However, the consequences affect not only the marine ecosystem, but also the terrestrial ecosystem as more and more environmentally harmful chemicals have been used to produce more and cheaper. In addition, increased industrialization has caused the onset of two phenomena: deforestation and desertification (Sachs, 2014). As can be understood, globalization currently cannot be called sustainable because it is based on principles that are highly in conflict with those of sustainable development. However, it is the idea of many scholars that it could provide support for building a better economically feasible and environmentally friendly structure. Indeed, one of the principles of such a process, competitiveness, could push industries to take the lead in respecting the environment and thus encourage others to follow suit (Giovannini, 2018).

Moreover, globalization, as will be seen in detail in the following section, in addition to its unsustainability, creates a breeding ground for the spread of infectious diseases such as Covid-19. The loss of biodiversity, in fact, combined with increasing global integration constitutes fertile ground for the proliferation of pathogens. This increasing spread of infectious diseases in addition to posing a serious threat to the health of countries brings with it countless economic and social damages. For this very reason, the objective of this paper is to analyze the economic, social and environmental impacts of the Covid-19 pandemic on the levels of sustainable development achieved by some countries on the European Continent. To do so, trends that emerged from 2015, the year of the promulgation of the 2030 Agenda, and 2020, the year of the pandemic outbreak, will be analyzed. In addition, this study aims to provide a picture of the measures taken by countries at the national level and to identify what might be critical to the achievement of effective and efficient levels of sustainable development. Therefore, this study hopes to be taken into consideration when implementing effective policies at the sustainable level.

The structure of this paper is as follows: theoretical background, methodology, results and discussion, and conclusion. In theoretical background the main economic, social and environmental effects of Covid-19 on the 17 SDGs proposed by the 2030 Agenda will be analyzed. In methodology section the indicators chosen for the analysis and the underlying methodology will be analyzed. In results and discussion section the results obtained from the construction of the sustainability index will be presented with related analysis of the main measures adopted and the main critical issues. Finally, in the conclusion the sums of the work will be drawn, strengths and weaknesses will be presented, and possible future studies will be presented.

2. THEORETICAL BACKGROUND

The increasing global interconnectedness caused by globalization has significantly promoted the spread of infectious diseases such as Covid-19 (Shrestha et al, 2020). In fact, it combined with the loss of biodiversity and increasing urbanization (Das et al, 2021) promotes the spread of new pathogens. Globalization therefore constitutes an essential mechanism in the proliferation of diseases (Tatem et al, 2006). And it is for this

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reason, that a disease such as Covid-19 discovered in late 2019 was declared a health emergency of international concern on January 30, 2020, a few months after its discovery (WHO, 2020a). Shortly after this declaration, moreover, the number of infected individuals increased exponentially worldwide: there were as many as 100,000 confirmed cases in 114 countries around the world (Leal Filho et al, 2020). Following this surge, the World Health Organization (WHO) declared this new disease a pandemic on March 1, 2020 (WHO, 2020b).

To respond to the emergency caused by the pandemic many countries around the world, advised by the WHO, implemented various plans, including social distancing strategies (dubbed "lockdown" by the media) (Primc & Slabe-Erker, 2020). These government restrictions have caused numerous devastating effects, including a general decrease in production, consumption, employment, and the supply chain (Fernandes, 2020). In fact, due to the blockade on transportation and travel imposed by government restrictions, the complexity about the procurement of seeds, feed and pesticides has increased. This has resulted in an increase in unsold and stockpiled items greatly reducing quality and increasing production costs (FAO, 2020). Therefore, lockdowns have affected all stages of the food supply chain including distribution and food quality (Poudel, 2020).

On the other hand, in terms of declining employment rates only a small percentage of work can be done from home. Dingel and Neiman (2020) showed in their study how in the United States only 34 percent of jobs can be practiced remotely. There are workers, in fact, such as those employed in the transportation, construction, retail, service, and hospitality sectors who are prevented from remote working (Dingel & Neiman, 2020). In addition, many of these sectors are dominated by women, which has meant that the crisis triggered by the pandemic has had a greater impact on this category of the population (Alon et al, 2020; ILO, 2020; OECD, 2020; United Nations, 2020). Therefore, the professional careers of many women were hindered significantly by reducing the achievements that many women had made up to that point. In addition, the fact that many couples were forced into domestic confinement by government restrictions increased the likelihood of domestic violence incidents. As many as 7 out of 10 women said during the pandemic situations of both physical and verbal violence by their partners became more common (Women U.N. and Count, 2021).

The crisis of the entire production chain and rising unemployment rates has caused an economic crisis even more severe than the financial crisis of 2008 (Grasso et al, 2021). While the effects of that crisis have had a severe impact on more developed economies, they have also profoundly undermined emerging and developing economies by making a significant dent in the poverty rates of these nations (Barbier & Burgess, 2020; Ju, 2020; Shulla et al,2021). Indeed, it was estimated that as many as 20 million households during 2020 had difficulty getting enough food and paying rent (Center on Budget and Policy Priorities, 2022).

Forced domestic confinement combined with the economic and social crisis has fostered an increase in mental illness, the phenomena of self-harm and suicide (Bar, 2021). This economic crisis has spilled over into one of the primary elements of economic well-being: education (Ciacci et al, 2021). In fact, the pandemic has resulted in the forced digitization of the entire school and university system. This has resulted in the exclusion from learning of about 1/3 of students worldwide (UNESCO, 2022). Also due to the social distancing measures there has been a loss of international students and scholars, and this has gone to the detriment of academic research (Shrestha et al, 2020).

However, the most visible effects were undoubtedly at the health care level. Due to the accelerated proliferation of the Covid-19 pathogen, health care facilities quickly found themselves in an overloaded situation. In addition, the growing fear of possible infection reduced the use of medical care, putting many Covid-19-infected individuals at risk (Leal Filho et al, 2020).

Trying to cope with Covid-19 additionally has resulted in the deployment of resources previously invested in combating other diseases. This has caused a reduction in prevention programs for diseases other than Covid-19 (Leal Filho et al, 2020).

Finally, in terms of environmental effects, the pandemic has caused both positive and negative effects. On the positive side due to government restrictions there was a decrease in CO2 levels which caused an improvement in air quality (Shulla et al, 2021). However, domestic confinement and national measures have caused on the other hand a considerable increase in water and wastewater consumption coupled with a reduction in energy consumption and a slowdown in the construction of new infrastructure useful to the international economy (Elavarasan, 2022). Table 1 shows the main effects of Covid-19 on sustainable development analyzed.

Table 1. Covid-19 effects on sustainable development.

DIMENSION	SUSTAINABLE DEVELOPMENT GOALS	COVID-19 EFFECTS	SOURCES
Economic Development		Reduction in disposable income and an increase in poverty rates Lockdowns and the resulting stoppage of most work activities caused many businesses to fail, exponentially increasing unemployment rates Increased social inequality and economic disparity	Barbier and Burgess, 2020 Ju, 2020; Grasso et al, 2021 Shulla et al.,2021 Leal Filho et al., 2020
Social inclusion		Neglect of diseases other than Covid-19 A third of students, due to lack of connectivity, have been excluded from learning Greater impact on women's employment and increased the likelihood of violence against women Increased conflicts	Leal Filho et al., 2020 UNESCO, 2022 Women, U. N., & Count, W., 2021 Keller,2005 Audi,2009
Environmental sustainability		Reduced access to food Increased water and wastewater consumption. Reducing energy consumption and slowing down infrastructure construction The restrictive measures have had positive effects: there has been a general improvement in air quality, a decrease in CO2 leading to positive consequences in the short term	FAO,2020 Poudel, 2020 Elavarasan, 2022

Source: Own elaboration.

3. METHODOLOGY

3.1. Material and objectives

Sustainable development, therefore, is a complex system. To measure this complexity, it becomes necessary to use social indicators, ad hoc tools that help researchers understand social phenomena (Brulè & Maggino, 2017). Social indicators, in fact, make it possible to identify and guide the course of social change (Ferriss, 1988).

It was decided in this paper that 17 indicators from Eurostat's database, taken for three different years: 2015, 2018, 2020, would be selected (table 2). The choice to use so many indicators illustrate the complexity and challenge of understanding the sustainable development phenomenon through the use of limited conceptual frameworks only (Alaimo et al.,2021). For data descriptive statistics, consult Appendix table 5.

This study aims to analyze the sustainable development levels of some countries on the European continent. These countries were selected on the basis of the completeness of data provided by Eurostat. The European case was chosen for two reasons:

- It is one of the continents most affected by the Covid-19 pandemic;
- It has an important territorial divide between the countries of Northern Europe, which are highly developed and have low levels of inequality, and the countries of the South, which have high public debts and the presence of both economic and social inequalities.

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3.2. Adjusted Mazziotta and Pareto Index (AMPI)

The AMPI is a variant of the MPI (Mazziotta & Pareto,2007) that is based on a Min-Max transformation instead of standardized deviations. The above transformation is based on two goalposts: a minimum and a maximum, which represent the possible range of variation of each indicator for all units and time considered (Mazziotta & Pareto, 2017). The first step to follow in constructing the index is to standardize the variables:

$$r_{ij} = \frac{\left(x_{ij} - Min_{xj}\right)}{\left(Max_{ij} - Min_{xj}\right)} 60 + 70$$

At this point it is possible to proceed with the calculation of the reference goalposts:

$$\begin{cases} Min_{x_j} = Rif_{x_j} - \Delta_{x_j} \\ Max_{x_j} = Rif_{x_j} + \Delta_{x_j} \end{cases} \quad \text{where:} \quad \begin{cases} \Delta_{1x_j} = Sup_{x_j} - Rif_{x_j} \\ \Delta_{2x_j} = Rif_{x_j} - Inf_{x_j} \\ \Delta_{x_j} = (\Delta_{1x_j} - \Delta_{2x_j})/2 \end{cases}$$

The values will be roughly in the range (70;130).
Finally, we proceed with the calculation of the index:

$$AMPI_i^{+/-} = M_{r_i} \pm S_{r_i} cv_i$$

The +/- sign indicates the sign of the relationship between the j-th indicator and the phenomenon to be measured. In our case, some indicators show positive polarity, while others show negative polarity. Therefore, before proceeding with the index calculation, the polarity of the negative indicators was transformed to a positive sign. Once the indicators were transformed, it was possible to aggregate the index using the.

The AMPI was chosen because it allows absolute temporal comparison. In fact, temporal comparison can be of two types: absolute and relative (Mazziotta & Pareto, 2013). Relative comparison occurs when the values of the composite index at time t depend on one or more endogenous parameters such as the mean and variance; consequently, absolute comparison occurs when the index values depend on exogenous values such as the minimum and maximum of the individual variables analyzed (Mazziotta & Pareto,2017). Moreover, the comparability of an index depends first and foremost on the normalization method used. In fact, methods such as standardization-used in the MPI-allow only relative comparisons since they are based solely on the values of individual indicators at time t. In contrast, methods such as the Min - Max transformation-used in the AMPI-since they require goalposts allow for absolute comparisons of indices (Tarantola,2008). However, to have indices comparable over time it becomes necessary to aggregate indicators with different variability (Mazziotta & Pareto,2017).

3.3. Cluster analysis

Cluster analysis is a tool used in various research fields that enables the classification of large amounts of information into manageable sets (OECD, 2008).There are several clustering techniques. In this study we will make use of the so-called Ward's method (Ward, 1963), one of the hierarchical clustering techniques (Johnson, 1967; Everitt, 1979).

This technique originates from the cluster $\{\{\Gamma_1\}\{\Gamma_2\}, \dots, \Gamma_n\}$ and from it the pair of clusters that most minimizes the increment is chosen. The latter is the sum of the quadratic differences between the averages of the cluster indicators divided by the total reciprocals of their cardinality (Młodak, 2020). Therefore, optimal clustering is achieved when the distance of clusters exceeds an arbitrarily established threshold (Młodak, 2020).

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Different cluster analysis techniques have both strengths and weaknesses. The benefits of such tools consist in their ability to provide insight about the structure of the dataset and the possibility of clustering different spatial realities. However, such tools are purely descriptive and, in some cases, lack transparency (OECD, 2008).

Cluster analysis can be used for different purposes. In this study it will be used to be able to better represent the change in sustainable development levels that occurred between 2015 and 2020. Indeed, as pointed out by OECD (2008) "visualization of the results should receive proper attention given that the visualization can influence or help to enhance interpretability."

Table 2. Indicators description.

Indicator	Description
People at risk of poverty or social exclusion (sdg_01_10)	This indicator is a measure of the number of people who are at high risk of poverty by social displacement, with serious material deprivation, or living in very low work-intensive households. Also, in the presence of multiple of these phenomena, people are being counted only once. Poverty risk amounts to an income less than the 60% of the national median equivalent income available level. In contrast, material deprivation results when people experience conditions of living seriously restricted by a lack of resources and when they cannot easily be able to afford at minimum 4 of the following services: i) paying rent and utility bills; ii) heating the house; iii) unexpected expenses; iv) meat, fish or a protein equivalent every other day; v) a week's vacation; vi) a car; vii) a washing machine; viii) a color television; and ix) a telephone. Last, a household is ultra-low labor intensity when members between the ages of 18 and 59 worked 20 % or below of their total work potential in the previous year.
Area under organic farming (sdg_02_40)	This indicator investigates the proportion of total used agricultural surface area covered by organic cultivation. Organic cultivation is considered all types of farming that conform to Council Regulation (EC) No. 834/2007.
Share of people with good or very good perceived health by sex (sdg_03_20)	This is a subject-measured indicator about how people evaluate their health. It is stated as the share of the population 16 years old or more who consider themselves to have "good" or "very good" health." The data is derived from the EU Survey of Income and Living Conditions (EU SILC).
Adult participation in learning by sex (sdg_04_60)	It is a Subjective Indicator measuring the percentage of people who said they received either formal or informal educational and technical education and non-formal training in the previous four weeks. Their denominator is total population in same age group, except those who did not answer the question "participation in education and training." These data were from the EU Labor Force Survey (EU-LFS).
Positions held by women in senior management positions (source: EIGE) (sdg_05_60)	It measures the ratio of women members on the boards of directors of the major companies traded on the financial system. Companies quoted on the stock exchange are defined as those companies' actions that are traded on the stock exchange. Larger companies, on the other hand, include companies whose members (maximum 50) are members of the blue-chip primary index, an index that includes the largest companies by market capitalization and/or market trading. Data are taken from the database of the European Institute for Gender Equality (EIGE).
Population having neither a bath, nor a shower, nor indoor flushing toilet in their household by poverty status (sdg_06_10)	Indicator measured the % of the entire population having no toilet, no shower, and no flush toilet in the home.

Indicator	Description
Primary energy consumption (sdg_07_10)	It measures the total demand for energy in a country, by excluding all kinds of non-energy applications of energy vectors, like the natural gas that is used to generate the production of chemicals. The consumption of primary energy consists of energy usage by final users for such services as industry, transportation, households, services, and agriculture, combined with the energy use of the energy sector itself for energy production and energy transformation and all the losses incurred by energy transformation.
Real GDP per capita (sdg_08_10)	That indicator is a measure of the relationship between real GDP and the population average in a specific year using only rounded numbers.
Gross domestic expenditure on R&D by sector (sdg_09_10)	This indicator is a measurement of gross domestic research and experimental development (R&D) spending.
Purchasing power adjusted GDP per capita (sdg_10_10)	This indicator's source figures are in purchasing purchasing power standards (PPS). The PPS provides a shared coinage representing a price gap between countries, so GDP in volume terms can be comparable. Amounts are measured against an EU average set at 100.
Overcrowding rate by poverty status (sdg_11_10)	It measures the share among the EU's population who live in an overpopulated condition. Overall overcrowding is caused if the household is lacking at minimum a living space for the total family and a living space for a couple, a single adult, a same-sex teenage couple, a different-sex teenager, and a child couple.
Circular material use rate (sdg_12_41)	That indicator is a measurement of the percentage of materials being recovered and returned to the economy. The circularity rate measures the ratio of the circular materials use to overall circular materials utilization. Indeed, the latter is the total of domestic material use and circular use of aggregate materials. The circularity rate is proximized by taking major waste and recycled waste exported for recycling out of the quantity of waste that is recycled at domestic recovery facilities.
Population covered by the Covenant of Mayors for Climate & Energy signatories (sdg_13_60)	It measures percentage of population size that is covered by the Covenant of Mayors by member state.
Surface of marine sites designated under Natura 2000 (sdg_14_10)	It measures area of designated marine sites in the Natura 2000 framework. This includes both protected marine and terrestrial sites and seeks a favorable preservation status for European habitat and species types of interest.
Surface of terrestrial sites designated under Natura 2000 (sdg_15_20)	It measures the surface area of terrestrial sites nominated under Natura 2000. This latter comprises marine protected areas and terrestrial areas and aims at a favorable state of conservation for habitat types and species of European interest.
General government total expenditure on law courts (sdg_16_30)	Indicator is measuring aggregate judicial expenditure on government courts by the classification of government departments. The latter incorporates all government and legal functioning spending (such as, for example, all expenditures helpful for the operation of civil, criminal, and judicial courts) excluding prison administrations.
EU imports from developing countries by country income groups (sdg_17_30)	It measures how much the EU imports from developing countries at the current prices. It is categorized based on the income categories of income groups of partner countries, but these groups can change over time.

Source: Eurostat

4. RESULTS AND DISCUSSION

This section will analyze the results obtained from the construction of sustainability indices (SIs).

4.1. Sustainable policies of the most virtuous countries: Sweden, France, the Netherlands, Germany, and Finland

European countries have shown increasing attention to sustainable issues over the years. Therefore, they have implemented various national measures to achieve the goals set at the international level. Table 3 shows the values of SI_{2015}, SI_{2018} and SI_{2020}. As can be seen, Sweden (SI_{2020}=109,219) emerges as the most sustainable state, confirming the 2015 position (SI_{2015}=110,550). In fact, in 1967, Sweden was the first to enact a law for environmental protection (SWEDEN.SE., 2021). Moreover, most of the energy produced comes from renewable energy sources, and in addition as a national goal to be pursued in the coming years is the reduction of greenhouse gas emissions (SWEDEN.SE., 2021). In addition to reducing greenhouse gas emissions, another goal is the elimination of fossil fuels by 2045 and the total production of renewable energy (SWEDEN.SE., 2021). To better implement these ambitious goals, a special governmental body was established in 2015: the Scientific Council for Sustainable Development (Kingdom of Sweden,2017). Also in the top 5 are France (SI_{2020}=108,572), the Netherlands (SI_{2020}=108,507), Germany (SI_{2020}=106,925) and Finland (SI_{2020}=106,348). Like Sweden, France has established an ad hoc body.

Indeed, it created a special interministerial representative in 2004: the Interministerial Delegate for Sustainable Development (DIDD). The DIDD is in charge of coordinating all those issues that concern sustainable issues (France Diplomacy - Ministry for Europe and Foreign Affairs, 2017). In 2016, the DIDD also contributed to the first French report on the achievement of the SDGs (Republic of France, 2016). Also, with a view to the SDGs, France has allocated €4 billion of which as much as €2 billion has been earmarked for the fight against climate change (France Diplomacy - Ministry for Europe and Foreign Affairs, 2017). Another area in which the French government is making a special effort is social inclusion. In fact, two forums have been created to make decision-making processes more inclusive: the National Council for Development and International Solidarity (CNDSI) and the National Council for Ecological Transition (CNTE)(France Diplomacy - Ministry for Europe and Foreign Affairs, 2017).

Third among the most virtuous countries is the Netherlands, which has among its strengths the high participation of civil society in decision-making processes. In fact, the "Building Change: Global Goals at Home and Abroad" project has been established through the years. Via this team, civil society can express itself freely on the achievement of the goals that the United Nations has set. In additional, the year before the Covid-19 pandemic outbreak, that team introduced the "SDG Test" project. This project aims to include feedback and requests from civil society in proposals for Sweden's new sustainable policies (SDG WATCH EUROPE, 2019b). Finally, like Sweden, the Netherlands is also making a strong commitment to combating climate change by promoting ecological transition and biodiversity protection as national priorities (Kingdom of the Netherlands, 2017).

Another country that, like Sweden and the Netherlands, is paying special attention to environmental issues is Germany. Indeed, it has reduced its greenhouse gas emissions by about 30 percent since the 1990s (Federal Government, 2022). Much attention is also being paid to marine biodiversity. In fact, in 2016, the Ministry for Economic Cooperation and Development promulgated a special action plan with the aim of preserving and conserving marine biodiversity and encouraging sustainable fishing (European Environment Agency,2020).

Finally, in the top 5 most sustainable European countries we find Finland. As in the case of the Netherlands, Finland is working hard on the inclusion of civil society in decision-making processes. Moreover, unlike the previous countries, one of Finland's priority goals is the reduction of inequality. For this reason, networks composed of young people, women, trade unions, and environmentalists have been created over the years, the purpose of which is information sharing and advocacy planning (SDG WATCH EUROPE,2019a). Finally, Finland also has a dedicated body for sustainable development, the National Commission for Sustainable Development, through which policy dialogues on these issues are organized on a regular basis (SDG WATCH EUROPE,2019a).

From the table 3 also it can be seen that the top 5 countries tend to confirm the results by changing at most one position in the European ranking. Same goes for the last positions in the ranking where we find

Greece (SI_{2020}=91,070), Lithuania (SI_{2020}=89,551), Latvia (SI2020=89,079), Bulgaria (SI_{2020}=87,374) and in the last position Romania (SI_{2020}=83,833).

Table 3. SIs and related ranks.

	SI 2015	RANK	SI 2018	RANK	SI 2020	RANK
SWEDEN	110.550	1	108.632	2	109.219	1
FRANCE	110.189	2	109.659	1	108.572	2
NETHERLANDS	108.139	4	107.213	4	108.507	3
GERMANY	109.914	3	107.921	3	106.925	4
FINLAND	106.052	6	104.966	5	106.348	5
BELGIUM	103.970	8	103.462	7	104.836	6
DENMARK	104.931	7	102.881	8	104.120	7
ITALY	103.344	9	102.163	9	103.539	8
SPAIN	106.241	5	104.912	6	102.842	9
IRELAND	101.081	11	102.117	10	102.357	10
LUXEMBOURG	101.306	10	99.159	13	101.585	11
SLOVENIA	100.424	12	101.153	11	100.130	12
CZECHIA	99.640	13	99.902	12	99.831	13
ESTONIA	96.758	14	97.284	14	97.067	14
POLAND	95.900	15	97.183	15	96.965	15
SLOVAKIA	94.153	17	94.615	19	95.746	16
HUNGARY	92.990	19	96.155	16	95.697	17
PORTUGAL	94.703	16	95.576	17	95.221	18
CYPRUS	93.018	18	94.487	20	93.182	19
MALTA	92.720	20	94.635	18	93.179	20
CROATIA	91.406	21	91.169	21	91.701	21
GREECE	91.149	22	91.015	22	91.070	22
LITHUANIA	87.634	25	88.244	24	89.551	23
LATVIA	90.808	23	89.609	23	89.079	24
BULGARIA	89.028	24	87.869	25	87.374	25
ROMANIA	83.082	26	83.588	26	83.833	26

Source: Own elaboration.

4.2. Spain and Italy: a comparison

As for the other European countries, in order to better analyze the progress and deterioration between 2015 and 2020, it was decided to calculate the variance from the mean value of the ranks (table 4). This method was chosen because, in addition to ensuring high replicability, it is a highly popular and well-known method. However, this method, being an absolute index of variability, is strongly affected by the unit of measurement of the phenomenon being analyzed.

As can be seen from table 4 the country to show the highest variability in sustainable development levels is Spain (variance=2.889). In fact, it can be seen that from 2015 to 2020 there has been a deterioration of as many as 4 positions. This deterioration could be due to two reasons: the phenomenon of desertification and Spanish socioeconomic conditions before and after Covid-19. Regarding the phenomenon of desertification, Spain, in fact, along with Portugal, Italy, Greece, Cyprus and Bulgaria and Romania constitutes one of the European countries that will see its natural resources shrink in the coming years (Valdivia, 2019). Among the countries mentioned, however, Spain shows the most worrying data: 74 percent of Spanish territory is at risk of desertification and 18 percent of it is at high risk of reaching the point of no return (ECA, 2018). The most high-risk territorial areas (90% desertification risk) are the regions of Murcia, Valencia, and the Canary Islands (ECA, 2018). Contrary to popular belief, the lack of water - the main reason behind the desertification phenomenon - is not due to drought (WWF, 2019), but rather to 3 different reasons (Ecologistas en Acción, 2007):

1. Excessive urbanization: this phenomenon combined with infrastructure construction is the main cause of irreversible land destruction;
2. Excessive construction of transportation infrastructure: together with urbanization it is one of the main factors in the irreversible loss of fertile land;
3. Unsustainable water use: the use of poor irrigation techniques combined with inefficient Spanish policy since the 1960s has fostered the phenomenon of erosion of natural sources.

The phenomenon of desertification in Spain has worsened significantly from 2000 until now due to global warming and the territorial imbalance present between rural/urban and inland/coastal areas. These two drivers are significantly changing Spain's natural landscapes (Martínez-Valderrama, 2022). Moreover, Spain along with Italy was the country most affected by the effects of Covid-19 in Europe. In fact, the economic impact of the pandemic has been devastating: as much as minus 10.8 percentage points. This recession constitutes the most severe economic crisis in 80 years and the worst in Europe (Real Instituto Elcano, 2021). The main reason for such a devastating impact of the pandemic lies in the collapse of tourism. In fact, the tourism and hospitality sector weighs as much as 26 percent of the national GDP. For this reason, government restrictions combined with a freeze on international tourism have caused a collapse of about 60 million tourists in 2020 (Real Instituto Elcano, 2021). In addition to this, the already high unemployment rate (14 percent at the beginning of the pandemic) was further aggravated by as much as 2.2 percentage points (Real Instituto Elcano, 2021). This condition, coupled with a fiscal deficit of 2.8 percent of GDP and a public debt of 95.5 percent of GDP further aggravated Spain's already precarious situation (Real Instituto Elcano, 2021).

Moreover, Spain's political situation in recent years has also been problematic. In fact, from 2015 to 2020, the Iberian Peninsula has seen as many as 3 governments. This has meant a lack of effective plans to implement sustainable goals and to reduce the growing economic and social inequalities present within the country. However, the 2020 coalition government has shown a focus on sustainable issues and this could lead to increased levels of sustainable development in the future (Boto-Álvarez & García-Fernández, 2020).

In second position with a variance of 1,556 we find Hungary, Luxembourg, and Slovakia. These countries although having an equal variance show different results over the years. In the case of Hungary, we can see an improvement of as many as 3 positions between 2015 and 2018 and a worsening of one position between 2018 and 2020. For Luxembourg on the contrary, we note a worsening between 2015 and 2018 of 3 positions and an improvement of 2 positions between 2018 and 2020. Similar discourse applies to Slovakia: between 2015 and 2018 we see a worsening of 2 positions and an improvement of 1 position between 2018 and 2020.

Furthermore, from table 4 the case of Italy emerges interestingly, which despite being one of the countries most affected by the covid-19 pandemic shows an improvement of one position between 2018 and 2020. This could have two possible explanations:

- The effects of measures taken over the years are beginning to be seen;
- The full devastating effects of Covid-19 are not yet visible in the short term.

Regarding the first explanation in early 2020, the Ministry for the South and Territorial Cohesion issued a measure to reduce the historical territorial gap present within the Italian Peninsula: the Plan for the South 2030 (Ministro per il Sud e la Coesione territoriale, 2020). In fact, Italy is characterized by a polarization between the levels of the North-Central Regions, the most sustainably developed and with high levels of GDP per capita and low inequalities, and the Southern Regions with low levels of sustainability, low levels of GDP per capita and high inequalities (Bartiromo et al, 2022). For this reason, in order to bridge this territorial gap, the Plan for the South has been structured around five priority missions: 1) a youth-focused South; 2) a connected and inclusive South; 3) a South for the ecological turnaround; 4) a South for the frontier of innovation; and 5) a South open to the world in the Mediterranean (Ministro per il Sud e la Coesione territoriale, 2020). To achieve these five missions, the government will try to intervene with an effort of 123 billion euros over ten years, which will be guaranteed by the 34 percent clause to the Mezzogiorno. According to this clause, 34 percent of all public funding will have to be allocated to investments in infrastructure, economic development, tourism revitalization and ecological transition for Southern Italy. And it is precisely this last type of investment, the one inherent in ecological transition, that is one of the primary objectives of the plan. Indeed, the idea is to put into practice the commitments made in the European Green Deal in the South, but especially in the most inland and backward areas. The goal of ecological transition can in turn be broken down into five points (Ministro per il Sud e la Coesione territoriale, 2020): 1) the possibility for households to achieve significant savings in their bills through energy income and thus through self-consumption; 2) the experimentation of a circular economy through the placement of smart bins i.e., digital and sustainable devices for separate waste collection; 3) the enhancement of sustainable transportation, a decrease in CO2 emissions and a reduction in travel time; 4) the increase in competitiveness and sustainability of agricultural and agribusiness enterprises through the development of contracts in the agribusiness sector; and 5) sustainable forest management aimed at decreasing hydrogeological disruption and stimulating wood-energy system supply chains.

Regarding, however, the second explanation, Italy, in the context of the Next Generation EU, has adjusted the so-called National Recovery and Resilience Plan (PNRR) to try to curb the economic, social and environmental effects for the medium to long term of the pandemic. The PNRR as can be read on the website of the Ministry of Economy and Finance "is part of the Next Generation EU program, the €750 billion package, about half of which consists of grants, agreed by the European Union in response to the pandemic crisis." The total funds provided for the NGEU are around 248 billion euros of which 26 billion euros are earmarked for the implementation of specific works and to replenish the resources of the Development and Cohesion Fund. This plan starts from three strategic axes (MEF, 2021): 1) digitalization and innovation; 2) ecological transition; and 3) social inclusion. To achieve these goals, the PNRR is developed into six missions:

1. Digitalization, innovation, competitiveness and culture: this mission aims to promote digital transformation, support the innovation of the entire production system and invest in tourism and culture;
2. Green Revolution and Ecological Transition: this mission aims to improve the sustainability and resilience of the Italian economic system and achieve a complete equitable and inclusive environmental transition;
3. Infrastructure for Sustainable Mobility: this mission aims to create a modern, sustainable and extended transportation infrastructure throughout the country;
4. Education and Research: this mission aims to strengthen the education system, technical-scientific and digital skills, and especially research and technology transfer;
5. Inclusion and cohesion: this mission wants to facilitate labor market participation;

6. Health: this mission aims to strengthen regional health systems particularly those in Southern Italy and to modernize and strengthen the national one and ensure that everyone gets the care they need.

Finally, with a variance from the mean value of the ranks equal to 0 we find Croatia, Estonia, Greece, Poland, and Romania.

Table 4. Variance from mean of ranks.

	RANK 2015	RANK 2018	RANK 2020	MEAN	VARIANCE
SPAIN	5	6	9	6.667	2.889
HUNGARY	19	16	17	17.333	1.556
LUXEMBOURG	10	13	11	11.333	1.556
SLOVAKIA	17	19	16	17.333	1.556
MALTA	20	18	20	19.333	0.889
BELGIUM	8	7	6	7.000	0.667
CYPRUS	18	20	19	19.000	0.667
LITHUANIA	25	24	23	24.000	0.667
PORTUGAL	16	17	18	17.000	0.667
NETHERLANDS	4	4	3	3.667	0.222
SWEDEN	1	2	1	1.333	0.222
BULGARIA	24	25	25	24.667	0.222
DENMARK	7	8	7	7.333	0.222
FINLAND	6	5	5	5.333	0.222
LATVIA	23	23	24	23.333	0.222
CZECHIA	13	12	13	12.667	0.222
IRELAND	11	10	10	10.333	0.222
ITALY	9	9	8	8.667	0.222
SLOVENIA	12	11	12	11.667	0.222
FRANCE	2	1	2	1.667	0.222
GERMANY	3	3	4	3.333	0.222
CROATIA	21	21	21	21.000	0
ESTONIA	14	14	14	14.000	0
GREECE	22	22	22	22.000	0
POLAND	15	15	15	15.000	0
ROMANIA	26	26	26	26.000	0

Source: Own elaboration.

4.3. European policies against the effects of Covid-19: the Next Generation EU

As anticipated in the previous section, in order to better represent the results and variability of the phenomenon of sustainable development, a clustering of the European countries analyzed was performed (Appendix, figure 3). Once the clustering was done, SI_{2015} and SI_{2020} were represented through a cartogram (figure 2). As can be seen from figure 2 the Northeast and Eastern countries show consistent levels of sustainable development over the years. Different is the case of the Central and Southwestern countries which show a deterioration between 2015 and 2020. In addition to the Spanish case, highlighted above, the deterioration of Germany is interesting, which, although it remains in the top positions over the years, shows a relevant deterioration between 2015 and 2020. Bucking the trend is the Netherlands, which shows a significant improvement between 2015 and 2018.

Thus, the Covid-19 pandemic has caused a serious economic and social crisis and a general deterioration in sustainable development levels. For this reason, the countries of the European continent belonging to the European Union have issued national plans to try to cope with all the harmful effects of the pandemic. All these national plans have been included in the larger and more ambitious European project: the Next Generation EU (NGEU). This instrument consists of a series of temporary allocations worth 800 billion euros. These funds aim at a greener, digital, resilient Europe prepared for both past and future challenges (European Commission, 2022). Being such an ambitious project, the NGEU is composed of broad and diverse measures. The most important of it is the Recovery and Resilience Facility. It financed by 732.8 billion euros divided into loans and grants will help all member states emerge from the crisis generated by the pandemic (European Commission, 2022). Another centerpiece of the NGEU is undoubtedly the Recovery Assistance for Cohesion and the Territories of Europe (REACT-EU). It, funded by 1074.3 billion euros, devotes special attention to green and digital transition among its many objectives (Consilium Europe,2022).

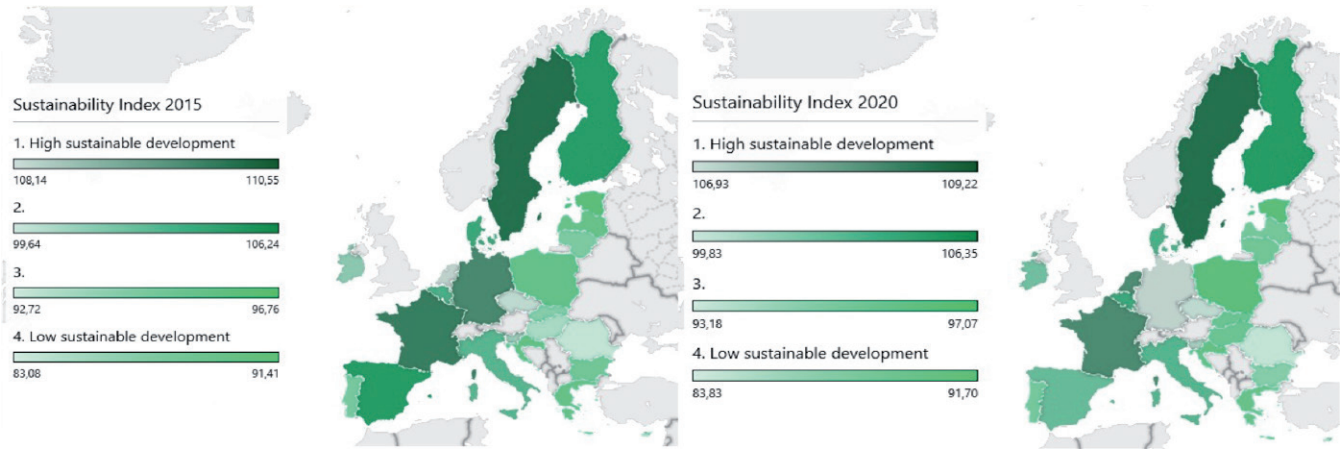

Figure 2. Comparison of cartograms of SI 2015 and SI 2020. Source: Own elaboration.

5. CONCLUSION

This paper analyzed in a time perspective the levels of sustainable development in the European Continent between 2015 and 2020. It showed how, despite the efforts made through the 2030 Agenda, there has been a gradual and steady deterioration in the levels of sustainable development achieved by countries over the years. In addition, the study demonstrated the presence of different territorial specificities. This fact was confirmed by comparing Spain and Italy. These countries although experiencing a similar economic and social situation, in fact, show different levels of sustainable development. Italy shows itself to be much more resilient than the Spanish reality thanks perhaps to the greater number of attempts made to recover from

the crisis. Spain, therefore, should try to take as an example the most virtuous states, Sweden, France, the Netherlands, Germany and Finland, to try to promote sustainable policies and, above all, find a solution to the growing phenomenon of desertification, which-as we have seen-is a concern throughout the Iberian Peninsula. In addition, the study highlighted the presence of countries (Croatia, Estonia, Greece, Poland and Romania) that have not improved their levels of sustainable development over the years. This underscores the need for action both at the national level, but more importantly at the European and international levels to try to encourage the promulgation of sustainable policies in these countries that are attentive to the needs of future generations.

The strength of this work lies in the fact that it has created 3 different sustainability indices useful for measuring the phenomenon from a time perspective. In fact, the chosen method, the AMPI, allows absolute temporal comparison and high replicability of results. However, in order to be temporally comparable, this method aggregates indicators with different variability (Mazziotta & Pareto, 2017). Moreover, this study could be replicated at the national level in order to better analyze individual territorial specificities and how they were affected by the effects of the pandemic. In addition, one approach to follow in future studies could be partial correlations. This symmetrical approach would allow the variance within each country to be measured. Finally, this study could be repeated years later in order to analyze the effects of policies implemented over the years.

Responsible reporting and conflict of interest

All authors undertake to disclose any existing or potential conflict of interest in relation to the publication of their article. Likewise, for articles with more than one author, the tasks carried out by each of them will be indicated.

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APPENDIX

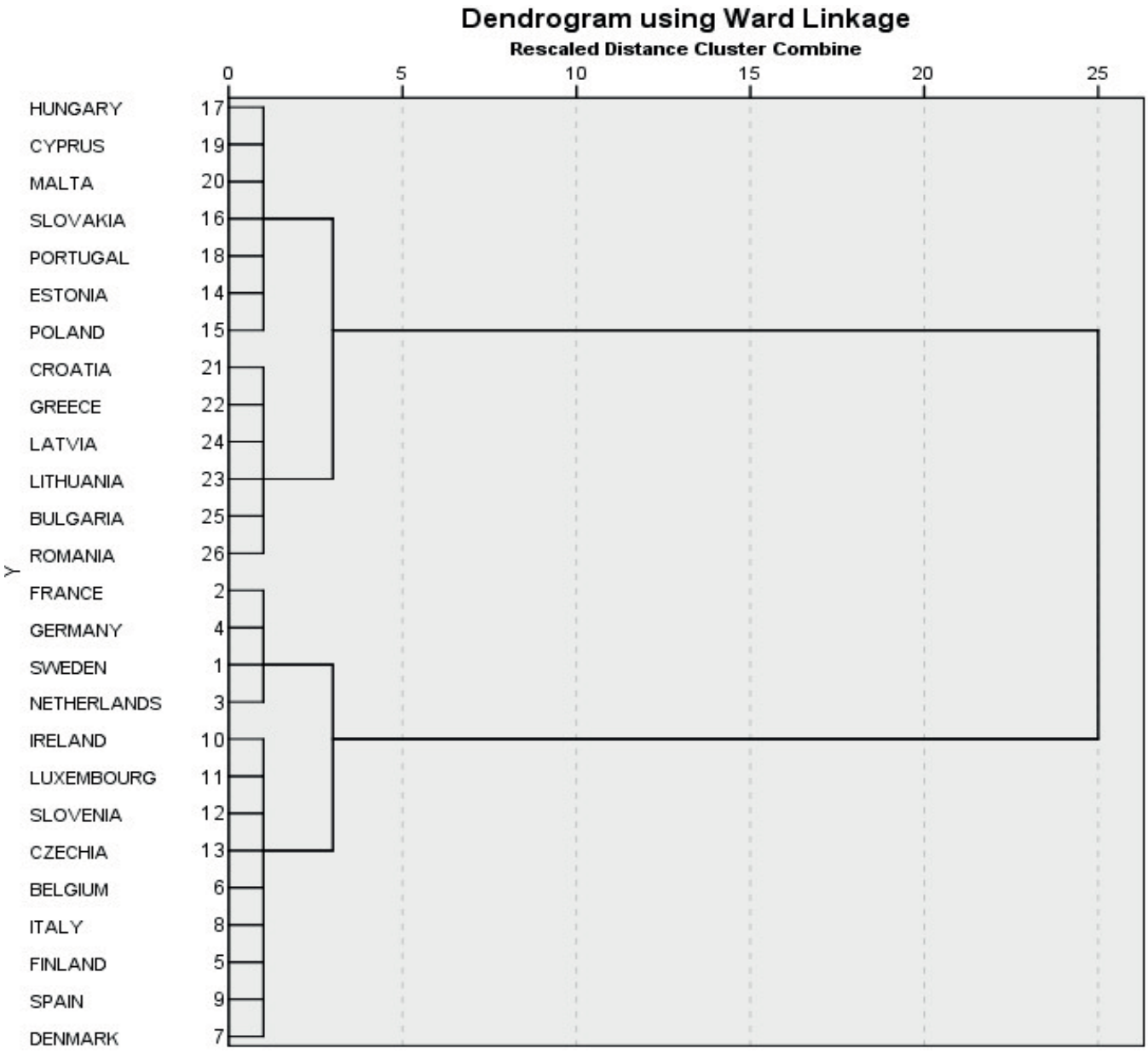

Figure 3. Hierarchical cluster analysis with Ward method. Source: Own elaboration.

Table 5. Data descriptive statistics.

	2015									
	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
sdg_01_10	58.70	89.04	75.1924	1.46478	8.15555	66.513	-.474	.421	-.493	.821
sdg_02_40	-1.61	17.14	6.9582	.92520	5.15129	26.536	.532	.421	-.537	.821
sdg_03_20	38.50	84.82	62.8909	2.31754	12.90350	166.500	-.437	.421	-.456	.821
sdg_04_60	-6.45	37.50	12.1464	2.03659	11.33924	128.578	1.111	.421	.526	.821
sdg_05_60	3.68	35.60	19.2800	1.72044	9.57902	91.758	.136	.421	-1.020	.821
sdg_06_10	81.10	107.68	97.7388	.96676	5.38267	28.973	-2.041	.421	4.956	.821
sdg_07_10	72.00	106.18	89.2127	1.58129	8.80427	77.515	-.027	.421	.433	.821
sdg_08_10	-8.30	24.00	4.1448	1.14244	6.36084	40.460	2.047	.421	5.456	.821
sdg_09_10	-.15	2.24	.9357	.12815	.71353	.509	.520	.421	-1.024	.821
sdg_10_10	-4676.92	77600.00	28676.4268	3114.49235	17340.75952	300701940.574	1.504	.421	3.001	.821
sdg_11_10	54.40	105.30	82.4593	2.95240	16.43827	270.217	-.507	.421	-1.342	.821
sdg_12_41	-3.93	25.80	8.4789	1.29598	7.21569	52.066	1.000	.421	.575	.821
sdg_13_60	-12.761	37.811	6.96703	2.026642	11.283864	127.326	1.607	.421	2.450	.821
sdg_14_10	-29180.91	84386.00	14889.9399	4215.24288	23469.47910	550816449.300	1.791	.421	3.927	.821
sdg_15_20	-40101.77	137757.00	31346.0868	7094.26342	39499.18708	1560185779.726	1.284	.421	1.913	.821
sdg_16_30	-7.73	190.40	76.8632	8.54832	47.59501	2265.285	.911	.421	.551	.821
sdg_17_30	-23246.69	69064.00	12692.3362	3933.02896	21898.17849	479530221.063	1.663	.421	2.355	.821
	2018									
sdg_01_10	67.20	88.37	78.0325	1.14306	6.36428	40.504	-.343	.421	-.846	.821
sdg_02_40	-1.99	20.98	8.4480	1.12694	6.27454	39.370	.592	.421	-.380	.821
sdg_03_20	41.10	85.72	63.9877	2.24121	12.47854	155.714	-.365	.421	-.350	.821
sdg_04_60	-6.25	38.80	13.1577	2.02279	11.26240	126.842	.903	.421	.253	.821
sdg_05_60	4.13	44.00	22.3768	2.06296	11.48607	131.930	.315	.421	-1.015	.821
sdg_06_10	85.60	105.79	98.2186	.73585	4.09704	16.786	-2.019	.421	4.856	.821
sdg_07_10	70.98	120.20	94.0107	2.19934	12.24539	149.950	.603	.421	.673	.821
sdg_08_10	-.82	7.70	3.0800	.40082	2.23166	4.980	.405	.421	-.443	.821
sdg_09_10	-.12	2.36	.9988	.12844	.71511	.511	.576	.421	-.834	.821
sdg_10_10	-1319.23	79200.00	31572.3325	3110.84891	17320.47373	299998810.078	1.434	.421	2.578	.821
sdg_11_10	56.80	104.16	83.1640	2.74490	15.28294	233.568	-.612	.421	-1.140	.821

sdg_12_41	-4.78	28.90	9.3280	1.44918	8.06867	65.103	.999	.421	.689	.821
sdg_13_60	-14.338	42.691	7.92226	2.280326	12.696315	161.196	1.609	.421	2.489	.821
sdg_14_10	-45590.62	129613.00	22152.8564	6611.95115	36813.78600	1355254839.335	1.828	.421	3.754	.821
sdg_15_20	-40127.27	138016.00	31451.2965	7111.63415	39595.90317	1567835548.232	1.281	.421	1.897	.821
sdg_16_30	-2.80	213.00	86.4649	9.01663	50.20247	2520.288	1.094	.421	1.085	.821
sdg_17_30	-29686.88	85523.00	14897.5757	4741.18102	26397.77872	696842721.297	1.693	.421	2.597	.821
2020										
sdg_01_10	67.90	89.28	79.1082	1.06528	5.93122	35.179	-.373	.421	-.546	.821
sdg_02_40	-1.81	22.41	9.2375	1.16939	6.51087	42.391	.492	.421	-.398	.821
sdg_03_20	40.90	86.16	65.1280	2.14080	11.91949	142.074	-.519	.421	-.167	.821
sdg_04_60	-5.94	35.50	11.7556	1.86955	10.40923	108.352	.960	.421	.368	.821
sdg_05_60	6.60	45.10	24.8955	2.16137	12.03401	144.817	.082	.421	-1.288	.821
sdg_06_10	89.60	104.12	98.6511	.52795	2.93950	8.641	-2.016	.421	4.870	.821
sdg_07_10	62.11	109.80	84.6943	1.98146	11.03230	121.712	.387	.421	1.184	.821
sdg_08_10	-12.91	4.70	-4.8040	.76362	4.25164	18.076	.410	.421	.462	.821
sdg_09_10	-.08	2.56	1.1094	.13571	.75560	.571	.614	.421	-.642	.821
sdg_10_10	-615.38	78700.00	31632.3821	3129.26829	17423.02846	303561920.882	1.446	.421	2.351	.821
sdg_11_10	57.50	104.26	83.6951	2.56386	14.27499	203.775	-.729	.421	-.861	.821
sdg_12_41	-4.68	30.90	10.5087	1.60221	8.92073	79.579	.859	.421	.144	.821
sdg_13_60	-14.479	43.464	8.17711	2.333416	12.991909	168.790	1.603	.421	2.418	.821
sdg_14_10	-45850.27	132688.00	23447.4545	6715.40254	37389.77892	1397995567.677	1.815	.421	3.758	.821
sdg_15_20	-40123.31	138083.00	31488.5025	7116.91487	39625.30496	1570164793.139	1.280	.421	1.889	.821
sdg_16_30	-10.52	239.90	93.7316	9.98020	55.56741	3087.738	1.204	.421	1.769	.821
sdg_17_30	-30867.96	91067.00	16536.8263	5078.70246	28277.01857	799589779.120	1.643	.421	2.391	.821

Source: Own elaboration.