Towards Socially Sustainable Development: The Social Quality Approach

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Abstract

Monitoring and assessing sustainable development necessitates establishing indicators focused on key societal aspects. While quantifying environmental and economic progress is relatively straightforward, the social domain faces challenges due to its lack of specificity and limited reporting capabilities. Consequently, this paper constructs a conceptual and methodological framework for evaluating social sustainable development by defining and implementing the concept of social quality. We applied and validated this novel methodology using data from European Union countries. The results of our study indicate significant variations in the implementation of social quality and its conditional factors among these countries. Denmark emerged with the highest level of social quality implementation, while Romania exhibited the lowest level. These disparities were observed across the four conditional factors of social quality: socio-economic security, social inclusion, social cohesion, and social empowerment. Additionally, our analysis revealed that differences in social quality implementation were not strictly aligned with traditional Western and Eastern bloc categorizations. Instead, we found mixed clusters of countries that did not conform to these regional divisions. This suggests that social quality dynamics are complex and influenced by various factors, highlighting the need for nuanced and context-specific approaches to improving social quality and sustainable development.

1 INTRODUCTION

The concept of sustainable development has been a focal point in academic research for several decades, encompassing sustainability and development. It is rooted in the understanding that unrestrained growth in areas such as population, production, consumption, and pollution is unrealistic given the limitations of our finite resources. This realization prompted the United Nations to formulate a concept that would address the constraints of limited resources while accommodating the need for growth. In 1987, the U.N. introduced the notion of sustainable development in what is known as the Brundtland Report. This report defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, p.15). Our Common Future. Oxford University Press. This definition remains relevant and enduring, acknowledging the critical global environmental issues stemming from both poverty in the global south and unsustainable consumption and production patterns in the global north.

Sustainable development is most often divided into three core dimensions: environmental, economic, and social. While the elements of the model are clearly articulated concerning economic and environmental sustainability, the social dimension often lacks precision in terms of necessary changes in social development (Almahmoud & Doloi, 2018). The concept of social sustainability has encountered challenges in implementation and clarity. Hariram et al. (2023)

pointed out this deficiency, highlighting the need for a comprehensive theory that integrates various dimensions of human existence with climate challenges, recognizing the role of social instability in causing environmental degradation. The European Commission (2015) also addressed the absence of a suitable methodology for measuring social sustainability in "Beyond GDP," emphasizing the necessity of expanding economic indicators to assess a nation's progress, genuine wealth, and overall well-being.

However, a universally accepted definition of social sustainability has remained elusive to date (Nasirzadeh et al., 2019). Different authors perceive social sustainability based on their specific disciplinary perspectives. For example, de Fine Licht and Folland (2019) posits that social sustainability is grounded in fundamental values such as equality and democracy, while Filho et al. (2022) emphasizes the preservation of social values like culture, equality, and social justice. Lewandowska et al. (2023) approach it from an organizational management standpoint, considering factors like "leadership." Barron and Gauntlett (2002) contend that social sustainability occurs when formal and informal processes, systems, structures, and relationships actively support the capacity of the next generation to create healthy and habitable communities. Beck et al. (2001) deviate from prevailing approaches by introducing theoretical concepts focused on quality of life, social capital, or human resources development. Pieper et al. (2019) follow a similar trajectory, but their research remains theoretical without a corresponding methodological model.

Despite the consensus on the need for a sufficiently general and uniform definition of social sustainability to provide a global perspective, it should also facilitate the identification of specific tools for its development. Some experts currently view this as unrealistic, primarily due to the persistent absence of a suitable theoretical concept (de Fine Licht & Folland, 2019). Social sustainability currently exists mainly as a system of social indicators without the necessary theoretical underpinning and exploration of their interconnections, diminishing its informative value. Recognizing this theoretical gap, we created and validated a model for quantifying social sustainability by identifying and operationalizing the concept of social quality. This model establishes measurable criteria for evaluating shifts in sustainable development within the social sphere.

The paper is structured as follows: the introduction covers the study's background and objectives, the literature review looks at existing methods and challenges in assessing sustainable development, the methodology section explains the framework development and data collection, the results section presents our findings, and the discussion interprets these results and their broader implications, ending with a summary and recommendations.

2 THEORETICAL BACKGROUND

Social quality is a multidimensional concept (Ehsan et al., 2019), encompassing various dimensions and perspectives. It is the result of the intricate interplay between societal and systemic integration (Phillips, 2001). Beck et al. (2001, p. 346) provides a definition that characterizes it as "the extent to which individuals can engage in social, economic, and cultural life, under conditions that enhance their well-being, capacity, and individual potential." The interpretation of the term "extent" within this definition can vary from a narrow to a broad perspective. Beck et al. (2012) conceptualization of social quality as a continuum with three fundamental factors – conditional, constitutional, and normative – provides a comprehensive framework for understanding and assessing the overall well-being and quality of life in a society. Conditional factors refer to the material and environmental conditions that individuals and communities experience in their daily lives. These conditions are often measurable and quantifiable. Constitutional factors delve into the social and institutional structures that shape

the distribution of resources, opportunities, and power within a society. These factors include the legal framework, political institutions, governance structures, and social cohesion. Normative factors focus on the subjective and cultural aspects of social quality. These factors pertain to the values, norms, beliefs, and cultural practices that influence how individuals perceive and experience their social environment. Normative factors are concerned with social cohesion, solidarity, and the quality of relationships among individuals and communities. These factors are interrelated and together offer a holistic perspective on social quality. Understanding the relationships among these factors is pivotal for the identification, quantification, and interpretation of social quality (Gasper et al., 2008).

At the level of conditional factors, social quality comprises four key components: socio-economic security, social inclusion, social cohesion, and social empowerment. Socio-economic security is rooted in the assurance of basic needs through existential security, including income, social protection, and healthcare (Beck et al., 2001). Phillips (2011) underscores the importance of the state's role in promoting active participation by citizens, rather than treating them solely as consumers. Social inclusion should be a fundamental objective, with minimal levels of social exclusion. Social exclusion, in general terms, refers to the denial or neglect of social rights. Society should provide opportunities for individuals to engage in economic, political, social, and cultural institutions, as well as other organizations, to foster social inclusion. The World Bank (2024) emphasizes the proactive aspect of achieving social inclusion. In summary, social quality is a complex concept with various dimensions and perspectives. It encompasses conditional factors such as socio-economic security and social inclusion, which are pivotal for enhancing both individual well-being and societal welfare. These considerations highlight the significance of societal structures that promote inclusivity, participation, and empowerment.

Social cohesion pertains to the unity of different communities and unity within communities. In modern societies, it represents the extent to which people feel integrated into institutions, organizations, and social systems (Gasper, 2008). It encompasses relationships with friends within free networks and plays a crucial role in both social development and individual self-realization. It equips individuals to confront rapid socio-economic changes effectively. Social empowerment enables individuals to take control of their lives and respond to challenges and opportunities (Herrmann, 2005; Abbot et al., 2016). Constitutional and normative factors are integral to other dimensions of social quality. Constitutional factors encompass personal security, social recognition, social responsiveness, and personal capacity. These elements reflect individuals' self-perception and the degree of their social recognition (Herrman et al., 2006). They also include personal capabilities for participating in public affairs, fostering relationships with others, nurturing social sentiments, and addressing institutions that influence daily life conditions, all while maintaining a sense of personal security. The assessment of social quality's implementation results necessitates the application of normative factors, including social justice, democratic citizenship, solidarity, and human dignity. These factors manifest in both the conditional (objective) and constitutional (subjective) dimensions of social quality (Herrmann, 2009). Tab. 1 provides an overview of the social quality factors.

Tab. 1 – Social Quality Factors. Source: Herrmann (2009)

Conditional Factors	Constitutional Factors	Normative Factors
Socio-Economic Security	Personal (Human) Security	Social Justice
Social Cohesion	Social Recognition	Democratic Citizenship
Social Inclusion	Social Responsiveness	Solidarity
Social Empowerment	Personal (Human) Capacity	Human Dignity

In theoretical terms, social quality is well-defined. However, its operationalization predominantly focuses on conditional factors. Interconnections among these components are intricate and not yet precisely determined, with Beck et al. (2001) highlighting that these relationships are neither linear nor strictly causal. Constitutional and normative factors remain subjects of ongoing development. Researchers, as evidenced (Yee & Chang, 2011; Lin & Herrmann, 2015), are striving to elucidate the complexities of social quality. Currently, social quality research appears fragmented due to its multidimensionality and multicausality, as observed in studies by König and Dováľová (2016), Baboš (2017), and Mikušová-Meričková and Nemec (2017), potentially hindering its comprehensive understanding (Kröber, 2011). Researchers often narrowly focus on analysing one conditional factor, leading to a lack of information about interrelationships and an underestimation of social quality's holistic nature (Kröber, 2011), which we aim to avoid in this paper. To address this challenge, we have developed our own quantification model for social quality, which also serves as a framework for quantifying social sustainable development.

3 RESEARCH OBJECTIVE, METHODOLOGY AND DATA

The primary objective of our study is to develop a robust framework that enables the evaluation of social sustainable development through the lens of social quality. We identified and quantified the disparities in the implementation of social quality and its conditional factors between the 27 E.U. countries using multivariate statistical methods. The method of constructing composite indicators was used to determine the ranking of countries. The source of data is Eurostat, and the period considered is 2021.

The selection of variables was derived based on their compliance with the described areas of socio-economic security, social inclusion, social cohesion and social empowerment, as well as their relevance to the basic aspects of social quality and sustainable development outlined in the text provided. The mentioned variables are commonly recognized indicators used in social science research to evaluate and measure various dimensions of social well-being and progress (Bardy et al., 2015).

We chose the following variables (Table 2)

Tab. 2 – Variables. Source: own processing.

Socio-economic Security	Social Inclusion
Gini coefficient of equivalised disposable income	Employment rate (%)
Inequality of income distribution (S80/S20)	Temporary employees (%)
Inability to face unexpected financial expenses (%)	Precarious employment (%)
Housing cost overburden rate (%)	Employment rate of non-EU nationals (%)
Population having neither a bath nor a shower nor an indoor flushing toilet (%)	Involuntary temporary employment (%)
Population reporting the occurrence of crime violence or vandalism (%)	Long-term unemployment rate (%)
Exposure to air pollution by particulate matter	Youth unemployment rate (%)
People killed in accidents at work (number of fatalities per 100000 employees)	Young people neither in employment nor in education and training (%)
Out-of-pocket expenditure on healthcare (%)	Overcrowding rate (%)
Share of people with good or very good perceived health (%)	
Social Cohesion	**Social Empowerment**
Perceived independence of the justice system (%)	Participation in early childhood education (%)
Corruption Perceptions Index (%)	Graduates at the doctoral level (%)

People at risk of poverty or social exclusion (%)	Adult participation in learning (%)
People at risk of poverty after social transfers (%)	Participation rate in education and training (%)
Income inequality for older people (%)	Early leavers from education and training (%)
At-risk-of-poverty rate for pensioners (%)	Expected years of schooling
At risk of poverty or social exclusion rate for elderly (65+)	Mean years of schooling
Children at risk of poverty or social exclusion (%)	Human resources in science and technology (%)
Gender employment gap (%)	Share of individuals having at least basic digital skills (%)
Seats held by women in national parliaments and governments (%)	Employment in high- and medium-high technology manufacturing and knowledge-intensive services (%)
Positions held by women in senior management positions (%)	High-speed internet coverage by type of area (%)

The index method was used to quantify the various social quality factors. An index is a composite statistic – a measure of changes in a representative group of individual data points, or in other words, a compound measure that aggregates multiple indicators. Indexes – also known as composite indicators – summarize and rank specific observations (Murgaš, 2009; Ira et al., 2006). This method offers a structured and systematic way to assign numerical values to these factors, enabling a more rigorous and comparable assessment across different dimensions of social quality. The values of individual sub-indexes (socio-economic security, social cohesion, social inclusion, and social empowerment) were determined as the arithmetic average of values of the transformed variables, which define the domains of these factors. In the transformation, if the increasing value of the variable had a positive effect on the state of the social quality, the following formula was used:

$$z_i = (x_i - min\,x_i)/(max\,x_i - min\,x_i) \quad (1)$$

The values of the variables whose growth had a negative effect on the growth of social quality were transformed by the formula:

$$z_i = (max\,x_i - x_i)/(max\,x_i - min\,x_i) \quad (2)$$

where x_i is the original value of the variable X, z_i is value after the transformation, $max\,x_i$ is the maximum and $min\,x_i$ is the minimum value of the variable. Values of the thus transformed variables, as well as their arithmetic mean, are from a consistent interval <0; 1>.

Employing such a comprehensive indicator offers several advantages, including simplicity in its construction, ease of interpretation, and its ability to capture prevalent and significant common trends among various diverse indicators. The inherent subjectivity in selecting variables and sub-indicators, as well as the potential for misinterpretation, can be mitigated through a profound understanding of the subject matter (Hrach & Mihola, 2005). The use of the main component method, as elaborated upon in Jobson (1992) and Rencher (2012), results in the creation of artificial variables represented as linear combinations of the original variables. These combinations' coefficients are determined by the eigenvalues of the correlation or covariance matrix of the original variables. Crucially, these newly derived variables maintain the same overall variability as the original set of variables.

Cluster analysis procedures were used in the segmentation of countries. Considering the identified links in individual groups of indicators, we applied the method of principal components during clustering. The principal components method (details in Jobson, 1992; Rencher, 2012) results in artificial variables that are expressed using a linear combination of the original variables. The coefficients of the combination are the eigenvalues of the correlation

or covariance matrix of the original variables. The newly created variables have a total variability that is the same as the variability of the original set of variables.

Main components were generated for each conditional factor of social quality. However, not all variables from the specific sub-model were included in their construction. During their construction, not all variables of the given submodel were used, but only those that met the requirements quantified by the Kaiser criterion (Kaiser, 1970; Kaiser & Rice, 1974). We applied the Kaiser-Guttman criterion to determine how many principal components or factors should be retained for further analysis. The principal components created for each sub-model of social quality were used to cluster the EU-27 countries. Ward's clustering method was used for clustering. We determined the number of clusters based on the values of the semi-partial correlation coefficient. The main components derived from each sub-model of the social quality framework were utilized to cluster the EU-27 countries, employing the Ward method. This process resulted in the creation of five clusters for each domain. We conducted calculations using SAS Enterprise Guide 5.1 and Excel.

In formulating our research questions, we considered the diversity of implementation of the social quality framework and the varying intensity of relationships between individual conditional factors. We have formulated a set of research questions:

RQ1: Does the implementation of social quality vary significantly among E.U. countries, and do these differences correspond to variations in the implementation of individual conditional factors?

RQ2: Are countries with higher levels of social quality implementation characterized by smaller disparities in the achieved levels of conditional factors compared to countries with lower levels of implementation?

RQ3: Is there varying intensity in the relationships between the different conditional factors of social quality, including socio-economic security, social inclusion, social cohesion, and social empowerment?

RQ4: Do Western countries with advanced economies exhibit a higher degree of social quality implementation across all conditional factors, while Eastern bloc countries manifest a lower level?

4 RESULTS AND DISCUSSION

This section provides a presentation of research results in accordance with the outlined themes in the methodology. Our research findings focused on two primary aspects: the clustering of E.U. countries based on their social quality, and an examination of the interrelationships among various conditional factors. These results offer a diverse perspective on the current state of social sustainability within the European Union, allowing us to identify disparities among various regions and economies.

4.1 Social Quality Implementation Differences

Focused on the implementation of social quality across E.U. countries, our RQ 1 aimed to assess the extent of variation in social quality implementation. Specifically, we investigated whether these differences corresponded to variations in the implementation of individual conditional factors.

The level of social quality implementation, as shown in Tab. 3, is represented by a summation index range within the interval of <0.348666 – 0.777615>, reflecting a difference of 0.428949 between the maximum and minimum values. The summary index (social quality) was created as a composite index from partial indices (conditional factors): socio-economic security, social inclusion, social cohesion, and social empowerment. Our research findings indicate that

Denmark has the highest level of social quality implementation (0.777615), whereas Romania demonstrates the lowest level (0.348666).

Tab. 3 – Differences in Intervals of Conditional Factors and Social Quality in 27 EU Countries. Source: own processing

Indexes	Interval	Range
Social Quality index	<0.348666 – 0.777615>	0.428949
Conditional Factors		
Socio-Economic Security	<0.313689 – 0.800239>	0.486550
Social Inclusion	<0.369872 – 0.766189>	0.396317
Social Cohesion	<0.266381 – 0.822973>	0.556592
Social Empowerment	<0.188238 – 0.812901>	0.624663

The notable discrepancy in index ranges between Denmark and Romania is a key observation in our analysis. This observation is primarily based on our analysis, as the normative factors of social quality have not yet been developed. Furthermore, our findings emphasize the significant variability in individual conditional factors of social quality across E.U. countries. The range exhibited by the social quality index within E.U. countries is of substantive significance, spanning from <0.348666 to 0.777615>. This delineates a notable heterogeneity in the spectrum of social quality levels across these nations. Higher scoring countries typically manifest heightened levels of overall societal well-being, while those with lower scores often encounter more pronounced impediments to social welfare. The least pronounced differentiation is observed in the realm of social inclusion, with slightly higher variability in social cohesion. Regarding the minimum and maximum values for conditional factors, it is indeed accurate that Denmark and Romania represent the extremes in the social quality index range, with Denmark achieving the highest value (0.777615) and Romania the lowest (0.348666). However, the minimum and maximum values for each specific conditional factor, such as socio-economic security, social inclusion, social cohesion, and social empowerment, may not necessarily apply exclusively to Denmark and Romania. The data reflects that there is variability across all 27 E.U. countries in these individual conditional factors, highlighting that different countries may excel or lag in various specific areas of social quality.

In contrast, socio-economic security, and especially social empowerment, exhibit the most substantial variability. Specifically, socio-economic security showed a difference of 0.48655 between the maximum and minimum index values, social inclusion exhibited a difference of 0.396317, social cohesion demonstrated a difference of 0.556592, and social empowerment displayed the highest variability with a difference of up to 0.624663 (Tab. 3). This analysis aligns with RQ1, confirming that social quality reaches different levels of implementation in E.U. countries, which is reflected in different levels of implementation of individual conditional factors.

4.2 Relationship Between Social Quality and Conditional Factors

Our RQ 2 centred on the relationship between social quality implementation levels and disparities in achieved levels of conditional factors across countries. We aimed to determine whether countries with higher levels of social quality implementation exhibited smaller disparities compared to those with lower implementation levels.

Denmark stands out with the highest level of social quality implementation, scoring 0.766502. In fact, Denmark ranks within the top 10 in all four conditional factors, although its specific positions within these factors vary. In socio-economic security, it holds the 6th position, while claiming the 1st position in both social inclusion and social cohesion, and the 2nd position in

social empowerment. This underscores the significant variability within individual conditional factors, even in high-performing countries like Denmark. Importantly, this variability is not unique to Denmark but is also observed in other countries. In Denmark, the indexes for individual dimensions of social quality fall within the range of <0.709719 - 0.811580> (Fig. 1), with a relatively narrow difference between the maximum and minimum value, only 0.101861. A similar pattern of minimal differences in the level of implementation of individual dimensions is observed in Sweden (0.12044) and the Netherlands (0.013685). Luxembourg also exhibits a comparable situation with a difference of 0.054122. This result illustrates that some countries, like Denmark, manage to maintain a relatively consistent level across different dimensions of social quality, while others may experience more significant variations within these dimensions (Fig. 1).
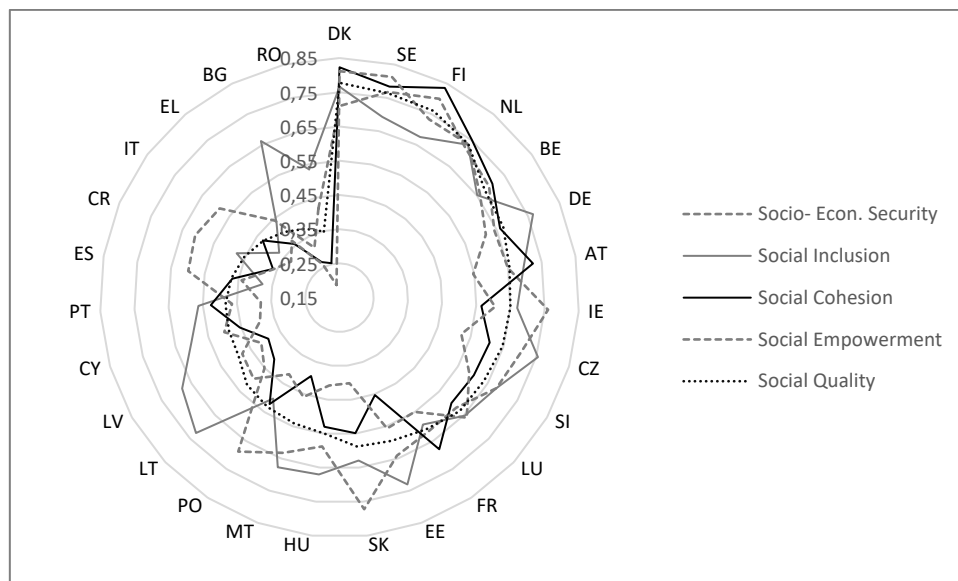

Fig. 1 – Social Quality Indexes. Source: own processing

Tab. 4 – Range of Values of States. Source: own processing

Indexes	Range of Values of States in 1st - 10th Place	Range of Values of States in 18th - 27th Place
Social Quality	0.140346	0.172561
Socio-Economic Security	0.121110	0.285162
Social Inclusion	0.087066	0.259037
Social Cohesion	0.215010	0.186502
Social Empowerment	0.256277	0.229915

Data from Tab. 4 illustrates the ranges of values for various indexes, both among the top ten and bottom ten E.U. countries. Firstly, concerning social quality, the range of values among the top ten E.U. countries falls between 0.140346 and 0.172561, indicating relatively consistent performance in terms of overall social quality. In contrast, among the bottom ten E.U. countries, the range is wider, suggesting greater disparities in social quality implementation within this group. Examining socio-economic security displays a notable variation, with a range of values from 0.121110 to 0.285162 among the top ten E.U. countries. This indicates considerable

diversity in socio-economic security policies and outcomes across these nations. Similarly, social inclusion shows a wide range of values from 0.087066 to 0.259037, indicating differences in the inclusivity of social policies and practices. However, social cohesion exhibits relatively minimal variation among both the top ten and bottom ten E.U. countries. With ranges of 0.215010 to 0.186502 and 0.186502 to 0.215010, respectively, this suggests that countries, regardless of their overall social quality ranking, tend to maintain similar levels of social cohesion. In contrast, social empowerment shows more pronounced disparities, with a range of values from 0.256277 to 0.229915 among the top ten E.U. countries and vice versa among the bottom ten E.U. countries. This indicates that while some countries excel in providing resources and opportunities for social empowerment, others lag behind significantly.

4. 3 Intensity of Relationships Between Conditional Factors

Our investigation, RQ 3, focused on elucidating the correlations among various conditional factors within the construct of social quality, including socio-economic security, social inclusion, social cohesion, and social empowerment. We employed statistical analyses, particularly examining Pearson correlation coefficient values between pairs of sub-indexes (as displayed in Tab. 5 and Fig. 2), to assess the intensity of these relationships.

Tab. 5 – Pearson Correlation Coefficient Values and Statistical Significance Test P-Values. Source: Own processing according to the Eurostat Database and HDI Database.

| Pearson Correlation Coefficients, N = 27 Prob > |r| under H_0: Rho=0				
	Socio-Economic Security	Social Inclusion	Social Cohesion	Social Empowerment
Socio-Economic Security	1.00000	0.28278 0.1529	0.77125 <.0001	0.69884 <.0001
Social Inclusion	0.28278 0.1529	1.00000	0.47703 0.0119	0.59875 0.0010
Social Cohesion	0.77125 <.0001	0.47703 0.0119	1.00000	0.88083 <.0001
Social Empowerment	0.69884	0.59875	0.88083	1.00000
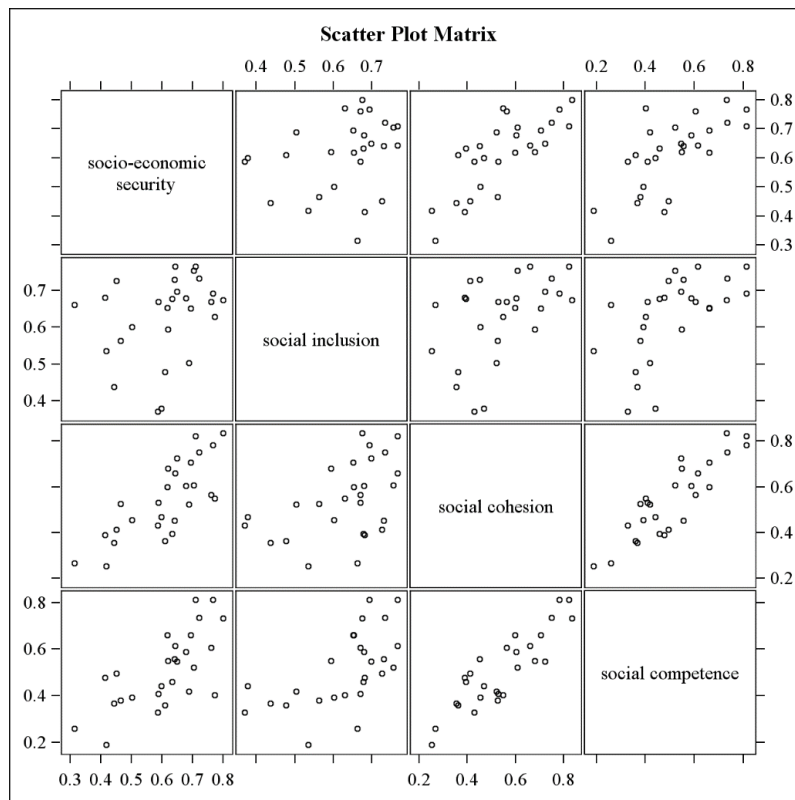
Fig. 2 – Matrix of Dependence between Conditional Factors. Source: own processing

The analysis revealed significant dependencies between various pairs of factors within the construct of social quality. The strongest statistically significant dependence was observed between social empowerment and social cohesion (r = 0.88083), followed by social cohesion and socio-economic security (r = 0.77125), social empowerment and socio-economic security (r = 0.69884), social empowerment and social inclusion (r = 0.59875), and social cohesion and social inclusion (r = 0.47703). Notably, social empowerment exhibited strong dependence on all other conditional factors, indicating its pivotal role within the framework of social quality.

4.4 Western vs. Eastern Bloc Comparison

Lastly, our RQ 4 examined the regional dynamics of social quality implementation, particularly focusing on Western countries with advanced economies and Eastern bloc countries. We investigated whether Western countries demonstrated a higher degree of social quality implementation across all conditional factors compared to their Eastern counterparts.

When creating the principal components that replaced the original variables in the clustering analysis, we had to exclude those variables that reduced the overall value of Kaiser's statistics (Kaiser's Measure of Sampling Adequacy: Overall MSA). We employed cluster analysis to address RQ3, leading to the formation of two large aggregations of states. Within these clusters, countries sharing the same cluster demonstrate similarity, while those in different clusters are more distantly related. This cluster analysis was applied to all four conditional factors of social quality, revealing significant differences among the five clusters within each factor.

Socio-economic security yielded two significant clusters, Cluster I and Cluster II, while the other groupings included only a limited number of countries (Tab. 6).

Tab. 6 – Clusters by Socio-Economic security. Source: own processing

Cluster I	Czech Republic, Slovenia, Italy, Cyprus, France, Luxembourg, Spain, Hungary, Portugal, Croatia, Austria
Cluster II	Germany, Malta, Slovakia, Finland, Belgium, the Netherlands, Sweden, Poland, Ireland, Estonia
Cluster III	Lithuania, Latvia
Cluster IV	Bulgaria, Romania
Cluster V	Greece

Notably, Clusters I and II do not show a clear dominance of Western or Eastern E.U. countries, indicating they are mixed clusters. In contrast, Clusters III and IV can be regarded as groupings of Eastern bloc countries. Cluster V, represented by Greece, exhibits significant differences from the others.

Tab. 7 – Average Values of Clusters in Socio-Economic Security. Source: own processing

Cluster I	Cluster II	Cluster III	Cluster IV	Cluster V	Variables
29.35	27.36	35.30	37.80	31.00	Gini coefficient of equivalised disposable income
4.65	4.14	6.49	7.59	5.11	Inequality of income distribution
32.14	26.07	48.30	40.40	47.80	Inability to face unexpected financial expenses
6.15	7.65	5.10	12.30	36.20	Housing cost overburden rate
0.55	0.65	8.20	14.95	0.20	Population having neither a bath, nor a shower, nor indoor flushing toilet
8.95	9.95	4.65	14.90	16.90	Population reporting occurrence of crime, violence or vandalism
14.11	8.54	11.60	17.45	14.10	Exposure to air pollution by particulate matter
2.39	1.26	2.90	3.19	0.92	People killed in accidents at work
18.92	17.83	33.94	28.34	35.18	Out-of-pocket expenditure on healthcare
66.68	69.85	46.65	69.20	79.30	Share of people with good or very good perceived health

Within clusters I and II, there are negligible differences in the values of individual socio-economic security indicators. In contrast, cluster III, consisting of Lithuania and Latvia, exhibits more substantial differences, particularly in the significantly higher Gini coefficient of equivalent disposable income. While the average for this indicator in cluster I is 29.35 and in cluster II is 27.36, Lithuania and Latvia reach up to 35.30. An even higher average is recorded in cluster IV, comprising Bulgaria and Romania, where it reaches 37.80. Notably, Bulgaria and Romania also have the highest income inequality (with an average of 7.59) among all E.U. countries. Significant differences are also observed in the burden of housing costs. Lithuania and Latvia (cluster III) have the lowest percentage of the population (an average of 5.1% for both countries) with housing costs exceeding 40% of total disposable household income. In contrast, Bulgaria, and Romania (cluster IV) have up to 12.3%, and Greece (cluster V) nearly 50% of the population (47.8%) facing such housing costs. Cluster IV countries (Bulgaria and Romania) are characterized by the lowest housing quality, where an average of 14.9% of the population lives in homes with issues such as leaking roofs, damp walls and floors, or rotten window frames and floors (Tab. 7).

The highest percentage of people at risk of crime is in Greece (16.9%) and in cluster IV countries (Bulgaria and Romania), with an average of 14.9% for this indicator. The lowest risk of this socio-pathological phenomenon is found in states in cluster I (8.95%). An interesting finding is that Greece has the healthiest perception, with 79.3% of the population considering their health good, which is consistent with the countries in cluster IV (69.2%). Conversely, the

smallest share of the population satisfied with their health is in countries in cluster III, with an average value of 46.65% (Tab. 7).

Social inclusion exhibits a higher degree of diversity among countries compared to socio-economic security. Most countries fall into clusters I and III, with only five countries in cluster II. The remaining two clusters are unique and include just five states together. Importantly, there are no significant distinctions between Western and Eastern countries in this context. Clusters I and II represent mixed groups of states, while cluster III consists of Eastern bloc countries, including Latvia, Hungary, Bulgaria, Romania, Poland, and Slovakia. In contrast, clusters IV and V exclusively comprise Western countries. Regarding social inclusion, there are certain differences in the relationship (Tab. 8).

Tab. 8 – Clusters by Social Inclusion. Source: own processing

Cluster I	Czech Republic, Slovenia, Italy, Cyprus, France, Luxembourg, Spain, Hungary, Portugal, Croatia, Austria
Cluster II	Finland, Sweden, Belgium, France, Croatia
Cluster III	Latvia, Hungary, Bulgaria, Romania, Poland, Slovakia
Cluster IV	Cyprus, Portugal, Spain
Cluster V	Greece, Italy

The most significant differences were observed in employment and unemployment rates. Cluster V, consisting of Greece and Italy, exhibits the lowest employment rate (average 62.15%), while the countries in cluster I have the highest employment rate, averaging 77.78%. Cluster IV, which includes Cyprus, Portugal, and Spain, is characterized by a high percentage of temporary staff, with an average of 17.13%. In contrast, cluster III, comprising only Eastern bloc countries (Latvia, Hungary, Bulgaria, Romania, Poland, and Slovakia), has the lowest percentage of temporary staff, averaging 5.33%. There are also noteworthy differences in the employment rate among citizens from outside the European Union (age group 20-64). Cluster III, consisting of post-totalitarian countries, boasts the highest employment rate, averaging 71.3%, while cluster II, which includes Finland, Sweden, Belgium, France, and Croatia, exhibits the lowest rate at 50.14% (Tab. 9).

Tab. 9 – Average Values of Clusters in Social Inclusion. Source: own processing

Cluster I	Cluster II	Cluster III	Cluster IV	Cluster V	Variables
77.78	73.76	74.48	73.07	62.15	Employment rate
7.51	12.54	5.33	17.13	10.95	Temporary employees
1.12	4.70	1.48	2.20	2.15	Precarious employment
69.37	50.14	71.03	67.57	60.50	Employment rate of non-EU nationals
2.41	9.72	4.42	17.03	11.50	Involuntary temporary employment
1.23	1.82	1.93	3.40	8.45	Long-term unemployment rate
4.50	7.50	3.93	7.80	7.75	Youth unemployment ratio
8.75	10.96	13.92	12.73	19.95	Young people neither in employment nor in education and training
10.50	15.04	36.85	5.87	28.50	Overcrowding rate

Differences also become evident in long-term unemployment, with Spain exhibiting the highest rate at 8.45%, while the countries in cluster I have the lowest rate, averaging 1.23%. A similar pattern is observed in the youth unemployment rate (ages 15-24). Cluster V, represented by Spain and Italy, records the highest youth unemployment rate, averaging 7.75%. In contrast, cluster III, comprising post-totalitarian countries, achieves the lowest percentage in this indicator, with an average of 3.93% (Tab. 9).

The most challenging situation for young people is observed in cluster V, which includes Greece and Italy. In these countries, an average of 19.95% of young people are neither employed, educated, nor in training. When examining social inclusion, a noticeable trend emerges in the differences between Western states and Eastern bloc states. Key indicators contributing to this trend include temporary employment, the youth unemployment rate, the employment rate of non-E.U. nationals, and the rate of overcrowding.

The following clusters of countries were formed via social cohesion (Tab. 10):

Tab. 10 – Clusters by Social Cohesion. Source: own processing

Cluster I	Denmark, Finland, the Netherlands, Austria, Belgium, France, Ireland, Luxembourg, Germany
Cluster II	Spain, Italy, Portugal
Cluster III	Latvia, Hungary, Bulgaria, Romania, Poland, Slovakia
Cluster IV	Poland, Slovakia, Hungary, Malta, the Czech Republic, Slovenia, Cyprus
Cluster V	Greece, Romania

In this conditional factor, the distinctions between the groups of countries in the 'eastern' and 'western' blocs become more pronounced. Clusters I and II are exclusively composed of Western E.U. states, while Cluster III comprises Eastern countries. Clusters IV and V, although mixed to some extent, are primarily composed of former Eastern bloc countries.

Tab. 11 – Average Values of Clusters in Social Cohesion. Source: own processing

Cluster I	Cluster II	Cluster III	Cluster IV	Cluster V	Variables
74.20	38.67	40.20	45.00	48.50	Perceived independence of the justice system
79.50	59.00	56.00	54.29	46.00	Corruption Perceptions Index
18.01	24.17	26.80	17.54	30.60	People at risk of poverty or social exclusion
14.56	19.33	21.22	13.36	20.85	People at risk of poverty after social transfers
3.74	4.93	4.63	3.23	4.08	Income inequality for older people - EU-SILC survey
13.18	13.17	39.90	17.27	15.20	At-risk-of-poverty rate for pensioners - EU-SILC survey
14.32	18.50	42.78	20.14	27.50	At risk of poverty or social exclusion rate for elderly (65+)
19.40	26.80	24.10	18.81	33.15	Children at risk of poverty or social exclusion
7.61	12.80	6.50	13.36	19.85	Gender employment gap
37.16	39.37	25.96	19.47	20.75	Seats held by women in national parliaments and governments
32.30	29.03	19.72	18.24	11.45	Positions held by women in senior management positions

Significant variations among individual groups of states are evident in the perception of the independence of their judicial systems. Countries in Cluster I exhibit the highest confidence in their judicial systems, with an average of 74.2%, while inhabitants of countries in Cluster II (Spain, Italy, and Portugal) express the lowest confidence, averaging 59%. A similar pattern emerges in the assessment of corruption levels, with the lowest perceived corruption found in Cluster I countries (average value: 79.5), while the highest levels of corruption are observed in Greece and Romania (average value: 46). The analysis of poverty indicators is based on four key measures. Cluster V countries (Greece and Romania) exhibit the highest rates in at-risk-of-poverty or social exclusion (30.60%), at-risk-of-poverty rate after social transfers (20.85%), at-risk-of-poverty rate among pensioners (39.9%), and at-risk-of-poverty rate among children (33.15%). Conversely, Cluster III countries (Estonia, Lithuania, Latvia, Bulgaria, and Hungary) have the highest at-risk-of-poverty rate among pensioners (39.90%) and the highest population aged over 65 (42.78) (Tab. 11).

The highest representation of women in national parliaments is found in countries within Cluster I (37.16%) and Cluster II (39.37%). In contrast, countries in Cluster IV (Poland, Slovakia, Hungary, Malta, the Czech Republic, Slovenia, and Cyprus) have the lowest representation of women, with an average value of 19.47%. When examining the positions held

by women in senior management roles, such as board members and executives in major companies, we find that countries in Clusters I and II also lead in this aspect, with average percentages of 32.3% and 29.03%, respectively. Conversely, the lowest representation of women in these positions is observed in countries within Cluster V, with an average of 11.45% (Tab. 11).

Social empowerment (Tab. 12) is considered one of the most crucial factors in both social quality and sustainable development, as it reflects individuals' professional competencies and their capacity to drive socio-economic changes. Interestingly, clusters I and III have a mix of both Western and Eastern countries, while clusters II and V are predominantly composed of Western nations. Notably, cluster IV is exclusively made up of Eastern bloc countries. Surprisingly, we did not observe significant differences in social empowerment between countries from the Western and Eastern blocs.

Tab. 12 – Clusters by Social Empowerment. Source: own processing

Cluster I	Cyprus, Slovakia, Croatia, Poland, Latvia, Greece, Lithuania
Cluster II	Denmark, Sweden, Luxembourg, the Netherlands, Finland
Cluster III	Czech Republic, Austria, Estonia, France, Belgium, Ireland, Slovenia, Germany
Cluster IV	Bulgaria, Romania, Italy, Hungary
Cluster V	Spain, Portugal, Malta

Tab. 13 – Average Values of Clusters in Social Empowerment. Source: own processing

Cluster I	Cluster II	Cluster III	Cluster IV	Cluster V	Variables
78.90	90.52	91.83	91.70	94.37	Participation in early childhood education by sex (children aged 4 and over)
0.43	1.00	0.90	0.38	0.53	Graduates at doctoral level
4.69	21.38	9.21	3.10	7.80	Adult participation in learning
11.07	30.90	18.70	9.90	16.47	Participation rate in education and training
6.07	7.68	7.61	13.63	13.93	Early leavers from education and training
16.03	18.12	17.20	15.00	16.73	Expected years of schooling
12.21	12.52	12.69	11.23	10.30	Mean years of schooling
49.43	72.40	60.75	37.75	55.00	Share of individuals having at least basic digital skills
44.96	60.28	50.93	35.08	44.07	Human resources in science and technology
39.53	53.50	47.49	37.40	43.43	Employment in high- and medium-high technology manufacturing and knowledge-intensive services
45.04	82.50	42.84	45.68	90.67	High-speed internet coverage, by type of area

In our analysis of social empowerment, we paid close attention to various factors, including pre-school education, doctoral studies, adult education, the average number of years of study, digital skills, and internet access. The proportion of children aged 4 years attending preschool education showed slight differences between the clusters. The highest attendance rates were observed in Spain, Portugal, and Malta, with an average indicator of 94.37% (Cluster V). In contrast, the lowest attendance rates were found in countries within Cluster I, including Cyprus, Slovakia, Croatia, Poland, Latvia, Greece, and Lithuania, with an average of 78.9%. Notably, countries in Cluster II, such as Denmark, Sweden, Luxembourg, the Netherlands, and Finland, stand out for their high participation in doctoral studies, with an average graduation rate of 1%. For comparison, Cluster IV, comprising Bulgaria, Romania, Italy, and Hungary, has a much lower graduation rate of only 0.38%. When it comes to adult education, which encompasses both formal and non-formal learning activities, countries in Cluster II also lead the way, with up to 21.38% of the population participating. On the other hand, Cluster IV countries, including Bulgaria, Romania, Italy, and Hungary, have a much lower participation rate in adult education, averaging only 3.10% (Tab.13). The basic digital skills indicator comprises three levels: low skills, basic skills, and over-basic skills. The highest percentage of residents with these skills can be found in countries within Cluster II, including Denmark, Sweden, Luxembourg, the

Netherlands, and Finland, with an average of 72.4%. Interestingly, these countries also invest significantly in adult education. On the other end of the spectrum, the lowest percentage of residents with basic digital skills is observed in Cyprus (Tab. 13). The indicator measuring human resources in science and technology, represented by the share of the active population aged 25 to 64 years employed in scientific and technical professions, reveals significant variations among the clusters. Cluster II, comprising Denmark, Sweden, Luxembourg, the Netherlands, and Finland, boasts the highest number of people working in science and technology, with an average of up to 60.28% across all countries. In contrast, the lowest percentage of residents in science and technology employment is found in Cluster IV, consisting of Bulgaria, Romania, Italy, and Hungary, with an average of 35.08%. When it comes to work in production sectors with top and medium technological levels, these roles often require a high level of knowledge and expertise. Cluster II, which includes Denmark, Sweden, Luxembourg, the Netherlands, and Finland, once again leads in this aspect, with the highest percentage of employees, at 53.5%. Conversely, Cluster IV, comprising Bulgaria, Romania, Italy, and Hungary, has the fewest employees in these sectors.

It's important to note that the level of social quality implementation varies across both western and eastern E.U. states, as evident in the provided information and Fig. 2 and Fig. 3. While there are certain tendencies associated with western and eastern countries in specific indicators within individual conditional factors, we cannot assert that western countries with advanced economies achieve a high level of social quality implementation in all its conditional factors, while eastern bloc countries manifest a lower level.
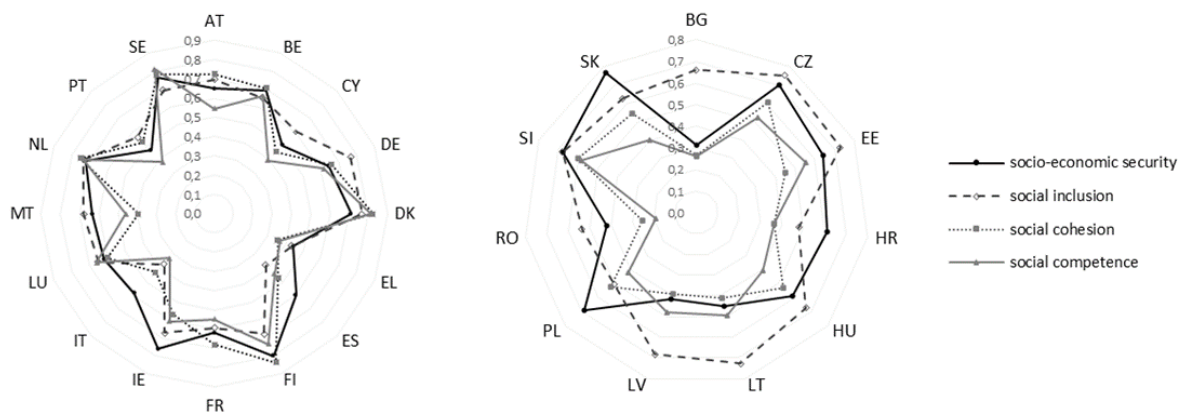

Fig. 3 – Conditional Factors in Western and Eastern E.U. Countries. Source: own processing

While there are certain tendencies associated with western and eastern countries in specific indicators within individual conditional factors, we cannot assert that western countries with advanced economies achieve a high level of social quality implementation in all its conditional factors, while eastern bloc countries manifest a lower level.

There is a lack of theoretical and empirical studies regarding concepts of social sustainability based on social quality. Grum and Grum (2020) create a model based on the integration of social quality dimensions, focusing on socio-economic security, social inclusion, social cohesion, and social empowerment. Their model provides a structured approach to quantifying social sustainability, addressing gaps in existing research and offering a framework for measuring and improving social well-being in various contexts. In contrast, the SOLA model (Pieper et al., 2019) offers an interdisciplinary, multi-level framework that integrates human

ecology, social systems, and ethical quality standards. It is designed to bridge gaps between social sciences and other disciplines, facilitating systematic comparison and guiding the development of social indicators. The SOLA model supports the evaluation of social sustainability by comparing approaches like social quality and social capital, providing a broader meta-model that complements the specific focus of Grum and Grum's framework. Ahn's approach (Anh & Cope, 2023) presents a model with five dimensions: safety and security, equity, adaptability, social inclusion and cohesion, and quality of life. This model focuses on managing social capital and addressing risks like natural disasters and climate change. Compared to Grum and Grum's structured approach and the SOLA model's broad framework, Ahn's model provides practical policy guidelines with an emphasis on cultural awareness and human well-being. Our model advances the discussion of social sustainability by proposing a framework similar to Ahn's, incorporating dimensions like social inclusion, quality of life, and adaptability. It also integrates elements of risk management and social capital. Our approach combines aspects of Grum and Grum's and Ahn's models to offer practical guidelines for policy development and resilience.

5 CONCLUSIONS

The results of our study indicate that there are significant variations in the implementation of social quality and its conditional factors among E.U. countries. Denmark emerged as the country with the highest level of social quality implementation, while Romania exhibited the lowest level. These disparities were observed across the four conditional factors of social quality: socio-economic security, social inclusion, social cohesion, and social empowerment. Additionally, our analysis revealed that the differences in social quality implementation were not strictly aligned with the traditional Western and Eastern bloc categorizations. Instead, we found mixed clusters of countries that did not conform to these regional divisions. Furthermore, the study identified significant relationships between the conditional factors of social quality. The strongest correlation was observed between social empowerment and social cohesion, suggesting that these factors are closely intertwined. This finding supports the hypothesis that the level of social quality implementation is strongly linked to the level of social empowerment. The 2030 Agenda and the Sustainable Development Goals, which was adopted by all U.N. countries in 2015, emphasizes the need to monitor not only the economic and environmental situations but also the social progress of individual countries. For this purpose, 17 objectives have been created, which have also become part of the regular statistical surveys in the European Union (Transforming our World: the 2030 Agenda for Sustainable Development). This approach has become an inspiration for us to create a specific model, which would allow us to examine the social indicators of sustainable development and at the same time the social quality, resp. its four conditional factors.

We have verified its suitability for use by empirical analysis. When applying it, we recommend the following:
1. The creation of sub-indexes for individual conditional factors of the social quality: the socio-economic security, the social inclusion, the social cohesion, and the social empowerment, which allow us to simultaneously examine the social sustainable development in the basic societal dimensions.
2. The creation of a synthetic social quality index, which also represents a synthetic quantifier of the social sustainable development.

These procedures enable a more detailed analysis of the existing socio-economic conditions in each country, allowing for comparisons within the European Union and revealing the synergy effects of gradual socio-economic transformation. However, there is still a need to develop

normative factors of social quality as tools for forming sustainable development. The following procedure is suggested for them to be followed:

a) To map the current situation in the social indicators of the sustainable development in each E.U. member state in detail.
b) To create or develop minimum standards or standards in the main areas of the social development at the national levels.
c) To re-define existing standards or create new European standards based on them.
d) To monitor the process of implementation of the social quality as well as the social sustainable development according to the newly established standards and to advise on their implementation in both the economic and social fields.

Social development currently remains the most vaguely defined category of sustainable development, even if it forms the core of the process. For this reason, this procedure emphasizes its further development as well as extended statistical monitoring, not only within the European Union but elsewhere. Social development is closely linked not only to other forms of sustainability but also to the various dimensions of society, whether ecological, economic, political, or cultural. Social quality, the model of which was used in the theoretical and methodological definition of social sustainable development, by its nature, sufficiently takes the specifics of the phenomenon and creates a wide space for the development of people who are the main subjects of all forms of sustainable development.

This study highlights the need for continued efforts to monitor and enhance social quality across European Union countries, promoting a holistic approach to sustainable development but also this study has some limitations:

- Data Availability: This study relies on existing data and indicators, which may not capture the full complexity of social sustainability. The quality and availability of data can vary between countries, which can introduce biases or limitations in the analysis.
- Eurocentric Focus: The study focuses on E.U. countries, which may not fully represent the global diversity of social sustainability challenges and solutions. Social sustainability can vary significantly in different regions of the world.
- Complexity of Social Quality: Social quality is a complex and multidimensional concept. While the study attempts to operationalize it into specific conditional factors, there may be other important dimensions of social sustainability that are not fully addressed.
- Temporal Limitations: The study is based on data available up to a certain point in time. Social conditions can change over time, and the study's findings may not reflect the most current situations.
- Correlation vs. Causation: While the study identifies correlations between the conditional factors of social quality, it may not establish causation. It is important to consider that observed relationships may be influenced by other unaccounted-for variables.
- Generalization: Findings related to the social quality framework's application in the European Union may not be directly generalizable to other regions or countries with different social, economic, and cultural contexts.
- Cluster Analysis: While cluster analysis is a valuable tool for grouping countries with similar characteristics, the choice to use the clustering method and the number of clusters can influence the results. Different clustering approaches may yield different groupings.

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