

Mistre, Baiba; Leibus, Inguna; Mazure, Gunita

Article

Assessment of social protection for families with children in the EU member states

Contemporary Economics

Provided in Cooperation with:

University of Finance and Management, Warsaw

Suggested Citation: Mistre, Baiba; Leibus, Inguna; Mazure, Gunita (2024) : Assessment of social protection for families with children in the EU member states, Contemporary Economics, ISSN 2300-8814, University of Finance and Management in Warsaw, Faculty of Management and Finance, Warsaw, Vol. 18, Iss. 2, pp. 210-222, <https://doi.org/10.5709/ce.1897-9254.534>

This Version is available at:

<https://hdl.handle.net/10419/312950>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/4.0/>

Primary submission: 12.05.2023 | Final acceptance: 05.10.2023

Assessment of Social Protection for Families with Children in the EU Member States

Baiba Mistre , Inguna Leibus , and Gunita Mazure 

ABSTRACT

The extent of social protection provided to families with children varies according to each country's unique economic, social, and demographic conditions. The most important factors for assessing social protection were studied and identified by means of the multivariate statistical analysis method, and the level of social protection was identified through cluster analysis in order to evaluate the level of social protection for families with children in the EU Member States. The research resulted in the classification of factors characterizing social protection for families with children into three groups: demographic, social, and economic. Respectively, the EU Member States may be divided into four different clusters. The most generous social protection for families with children is reported by the countries included into Cluster 4 (Scandinavia and Western Europe – welfare states), which spend a larger proportion of expenses on social protection compared to the other countries. Countries with greater demographic problems and low social protection are included into Cluster 2 (Southern Europe). Ireland, which is the only country in Cluster 1, has the best demographic and economic situation. Relatively weaker economic and social development is demonstrated by the EU Member States belonging to Cluster 3 (Central Europe, Eastern Europe and Portugal); however, the demographic situation indicators in these countries are above the EU average indicator and they do not significantly differ from the indicators of the countries belonging to Cluster 4.

KEY WORDS: social protection, families with children, cluster, EU Member States.

JEL Classification: I38, I39.

Latvia University of Life Sciences and Technologies, Latvia, Liela iela 2, LV-3001

1. Introduction

Each country creates a social security system for its citizens, which largely depends on the economic situation of the country as well as on the implemented social policy. Similarly, the social policy for families with children differs in each country but it has one target – to improve the welfare of children and to reduce poverty in families with children.

According to Pezer, the most effective form of support is a universal and targeted combination of support, which is implemented through various social benefits; thus, significantly reducing poverty in families. Family policy aims to offset the costs of raising

children, promote children's welfare, provide fertility support, improve the balance between work and family, and promote gender equality (Pezer, 2022, 2023).

Mezs (2013) after analyzing demographic policy differences in the EU Member States has come to the conclusion that there is a correlation between financial support for families with children and the birth rate. The more funds the state allocates for the support of families with children, the higher the birth rate, and vice versa.

However, it is recognized that the national expenditure indicators do not provide a sufficient picture of the generosity of family policy; yet, they allow drawing conclusions on the social policy of the country

Correspondence concerning this article should be addressed to:

Inguna Leibus, Latvia University of Life Sciences and Technologies, Latvia, Liela iela 2, LV-3001. E-mail: inguna.leibus@lbtu.lv

and its impact in reducing child poverty. It is also recognized that an increase in public spending in the social sphere by one percent per capita reduces the number of children at risk of poverty also by approximately one percent on average (Latvijas Republikas Saeima, 2022).

As noted by Nygard et al. (2019) the generosity for social protection among the EU Member States differs and the research authors highlight that Continental and Mediterranean countries mainly use a “transfer-based” strategy. Cash benefits (periodic and one-time), the provision of services in kind, including childcare, and tax credits are the main means of the support for families in the OECD social protection systems.

Generous social benefits play a vital role in reducing child poverty, especially in large and low-income families. Consequently, countries most often decide in favor of providing higher benefits to persons with children who are at the greatest risk of poverty (Latvijas Republikas Saeima, 2022).

Devaney et al. (2023) have admitted that the family support may be targeted at children, parents, or the whole family in general in order to improve children's welfare. The researchers having studied family support more frequently indicate in the literature that the support is for parents, it is less children or family oriented.

Researchers have different opinions on the most effective types of support. As Daly and Ferragina (2018) indicate the family policy has developed both in terms of content and time period. The researchers admit that countries are supplementing their family policy portfolio by diversifying family-related leaves, increasing child care services and providing tax allowances.

Research hypothesis – the level of social protection for families with children differs in the EU Member States consistent with their economic, social and demographic situation. The research aim is to assess the level of social protection for families with children in the EU context. The following tasks are advanced to achieve the set aim: to study and determine the most important factors for the assessment of social protection in the EU Member States and to identify the level of social protection in the EU Member States by applying cluster analysis.

Research methods: the monographic and descrip-

tive methods, analysis and synthesis, the graphic method, multivariate statistical analysis method and economic statistical method are used for the research purpose. The research employs the Eurostat data for 2020 and scientific publications related to the topic under the present study done by the research authors.

The research novelty – identification of the most important factors for the assessment of social protection for families with children and the appropriate classification of the EU Member States into clusters.

2. Results and Discussion

2.1. Indicators Characterizing Social Protection and Welfare, and Changes of Indicators

Social protection plays a vital role in ensuring human welfare in situations when one of the social risks occurs increasing insecurity about material welfare. The social protection system plays a stabilizing role and helps individuals and families manage risks and provides support. Both quantitative and qualitative indicators may be applied to measure welfare and, subsequently, social protection.

Grinfelde adverts that three groups of measurements might be used to measure welfare and poverty: measures of economic welfare, measures of non-economic welfare, and composite indicators (Grinfelde, 2010). Literature notes that economic measurements are most suitable when there is a need to provide quick, general calculations and summary conclusions in the short term. In contrast, non-economic measurements are better suitable when a more profound analysis is required, studying trends in the medium and long term (Sumner, 2004).

Latviete (2012) has classified welfare characterizing indicators according to the development of the concept of welfare within the period from 1950s to the first decade of the 21st century. The researcher ascertained that the concept of welfare has evolved from an economic perspective to multidimensional definitions. Initially, the GDP growth rate and the GDP growth per capita were used to measure welfare. Though, later more emphasis is placed on various indicators characterizing the welfare of population,

for example, the Human Development Index (Latviete, 2012). It is a composite index that allows assessing long-term progress in the three main areas of human development – health, education and income. The index clearly shows that the development is something more than the economic growth.

The Human Development Index (HDI) for the first time was published in the Human Development Report in 1990. Since then, the HDI has aroused a lot of interest as its components and the method of calculation are being broadly discussed among politicians, journalists and scientists. The method of calculating the Human Development Index and the selection of indicators are being constantly improved since the changes in 1990 (Latvijas Universitate, 2020).

As the working group of the Strategic Analysis Commission has indicated in its report “The Quality of Life Index of Latvia’s Population” (2006) such relatively simple index is good for comparing many countries of the world; yet, it does not encompass the main values of the population, and thus, the group of researchers conducted a survey and identified the priority aspects that are important for the population for increasing the quality of life (material welfare, employment, opportunity to participate in the labor market, education, level of knowledge; health, social security, housing and physical security). At the same time, the social studies and surveys conducted by the Commission in 2005-2006 showed the important role of other aspects in the population assessment of their quality of life (family, inclusion in processes, participation, full-value rest, and recreation).

Proper description of the material welfare requires considering the direct income of population and its benefits from public funds (support for education, health, and cultural services, public transport grants, etc.). In this case, the so-common GDP per capita cannot be applied, as it does not characterize the real income growth of an individual. In addition, inflation shall be taken into account, which in turn reduces the growth of income (Bela-Krumina et al., 2006).

Jersova and Kotane, in their turn, have remarked that the welfare of population may be studied by

employing both objective and subjective indicators (for example, life satisfaction of the population). Material welfare is most often characterized by the territorial development index, gross national product and gross domestic product per capita, quantity of durable goods per 100 inhabitants, various social indicators (for example, food consumption per capita, life expectancy, level of education etc.), level of purchasing power, income inequality indicators and disposable income (Jersova & Kotane, 2021).

Material welfare of the population is closely related to the economic development of the country. Only a high growth of the gross domestic product can ensure a rapid increase of the income of population, both in nominal and real terms (Bela-Krumina et al., 2006).

It is possible to distinguish three interconnected dimensions of family welfare – material, practical-moral and emancipatory dimension. The material dimension includes the necessity for food, clothing and housing. The practical-moral dimension emphasizes common understanding on the meaning of things, values and norms, and manifests itself through communication. The emancipatory dimension focuses on human autonomy and freedom, and emphasizes a reflexive critique of social practices and power structures affecting the family life. All the three dimensions are interrelated in the family life, and communication plays a fundamental role in ensuring family welfare (Millere, 2012).

Halaskova and Bednar (2020) have classified socio-economic indicators into four groups based on their analysis of the relationship between social protection expenditures and socio-economic indicators of the EU Member States:

1. socio-economic development indicators (GDP per capita, Human Development Index);
2. employment indicators (unemployment rate, long-term unemployment rate);
3. income inequality indicators (smoothed Gini coefficient, disposable income, income quintile share ratio);
4. poverty indicators (at risk of poverty or social exclusion rate for elderly people 65+, impact of social transfers on poverty reduction).

Researchers specify that real GDP is used also to compare the material welfare of countries. GDP per capita shows the level of material welfare of the country's population. However, it is not a complete indicator of economic welfare, as the negative consequences of economic activity, such as environmental degradation, are not considered when calculating this indicator. On the contrary, the Human Development Index is a much more complicated indicator than income per capita or GDP. The Human Development Index combines information on economic growth (GDP per capita according to the latest national income calculation methodology), education level, and health status. The researchers have found a positive relationship between the Human Development Index and the country's unemployment rate and social protection expenditure (Halskova & Bednar, 2020).

The Gini coefficient, in turn, is the most commonly used measure of income inequality. It varies between 0 and 100. The Gini coefficient is 0, if there is an absolute income equality. An indicator – average equivalent net income, namely, income after taxes paid per household member, is applied also by the official statistics to measure income inequality. It is calculated as a weighted average, where different weights are applied to different household members. This compares inequality which arises due to the market activity (after taxes but before pensions and benefits) with the existing income inequality (after pensions and benefits). Hence, it is possible to determine the impact of pensions and benefits on the reduction of income inequality. In addition, the coefficient shows the effectiveness of the state social support system (Vanaga & Sloka, 2022).

Gosa (2009) admits that social, economic, environmental and other factors affect the quality of life of each individual. The quality of life is characterized by the level of consumption available to the individual, the range and quality of social services as well as the opportunity to get an education, to live a long and healthy life and to participate in the political life of the country. It is also characterized by the elimination of discrimination due to gender, ethnicity, race, religion, disability, sexual orientation and age;

thus, creating opportunities for the individual to implement its potential in the process of building public welfare.

The material welfare of population is also closely related to the economic development level of the respective region, since only a high growth of the gross domestic product can ensure the increase of wages, pensions, benefits and other income. The gross domestic product per capita more precisely characterizes the economic development of regions (Gosa, 2009).

According to Ciemina (2009), the material welfare is one of the indicators of the life quality of population and it can be characterized in different aspects. Income, consumption expenses, savings and loans, and property might be mentioned as the main indicators. Professional considerations are the determining factor in the selection of the main aspect; though, the choice is limited by obtaining the relevant statistical data.

Balode et al. (2009) indicate that statistics frequently present the total amount of consumption expenditure calculated on average per household member per month as the main indicator of the standard of living, while disposable income is considered as a subordinate indicator due to its reduced reliability, since people are reluctant to disclose information about their income.

Consumer price index (CPI) reflects changes in the prices of consumer goods and services within a certain period of time. The CPI measures changes in the average price level in the consumption of population for the most significant prices and services (for a fixed consumption basket) (Oficialas statistikas portāls, 2023a).

Researchers Adema et al. (2014) studying the trends of family policy from an international perspective mark three main indicators that characterize the family support policy: total fertility rate, female employment and infant mortality. Total fertility rate is the average number of children that would be born to a female over her lifetime if the fertility rate in each age group remained at the level of the calculation year. The total fertility rate should be around 2.1 to ensure the generational change or the minimum required fertility rate is 2.1 children on average per woman

(Oficialas statistikas portals, 2023b). Low fertility may be related not only to a relatively low standard of living but also to social and psychological factors (Gosa, 2009).

According to Adema et al. (2014), female employment is also an important indicator representing the family welfare, as it shows gender equality in the labor market or family poverty risks. The risk of poverty will be lower in two-earner families. On the contrary, the benefit system is created to provide a working mother or father an opportunity to take the childcare leave and raise a child without losing their job, which certainly would have a positive effect on the child but leaves significant consequences on the career of the parents, especially the mother; thus, increasing the risk of losing qualification and work, which in the future may influence a woman's decision to have another child (Eglite et al., 2013).

Onambele et al. (2019) indicate on infant

mortality as an essential indicator characterizing the situation in the field of health and also reflecting the socio-economic development of the country.

Based on the research of scientific literature on indicators characterizing welfare, the authors of the present article classify these indicators into three groups – economic, social and demographic ones – to determine social protection support for families with children (Table 1). Individual indicators can be included both in the group of economic indicators and in the group of social indicators, for example, the indicators “Tax revenue”, “Household disposable income” and so on.

Based on the available statistical data, the research authors apply part of the identified indicators characterizing social protection in the following study to determine the level of social protection for families with children in the EU Member States.

Table 1

Economic, Social and Demographic Indicators Characterizing the Social Protection

Group of indicators	Indicators
Economic indicators	GDP, GDP per capita
	Gross national product
	Tax revenue
	Household disposable income
	Gross or net salary
	Average actual consumer price index
Social indicators	Average equivalent net income
	Territorial development index
	Social protection expenditure (social transfers)
	Female employment
	Gini coefficient
	Housing
Demographic indicators	Health
	Education
	Human Development Index
	Fertility (total fertility rate, crude birth rate)
	Infant mortality
	Age structure of the population
	Life expectancy
	Migration

2.2. Analysis of Factors Impacting Social Protection for Families with Children in the EU Member States

The factor analysis followed by the cluster analysis was performed during the course of the research by means of the SPSS software.

The factor analysis distinguishes five main steps:

Step 1 – creation of the initial factor matrix;

Step 2 – calculation and evaluation of the correlation matrix (Kaiser-Meyer-Olkin test and Bartlett's test);

Step 3 – determination of complex factors;

Step 4 – calculation of the factor matrix and evaluation of the obtained complex factors (Component Matrix), use of the rotation method (Varimax);

Step 5 – evaluation of the factor analysis results.

Step 1. In order to perform the factor analysis, a data matrix was constructed, where the phenomenon under study is described by m initial factors x_1, x_2, \dots, x_m for a set consisting of n objects. The information was arranged in a two-dimensional data array:

$$X = \begin{pmatrix} x_{11} & \dots & x_{21} & \dots & x_{i1} & \dots & x_{m1} \\ x_{12} & \dots & x_{22} & \dots & x_{i2} & \dots & x_{m2} \\ \dots & \dots & \dots & \dots & \dots & \dots & \dots \\ x_{1n} & \dots & x_{2n} & \dots & x_{in} & \dots & x_{mn} \end{pmatrix}$$

The rows of the table correspond to the units of the researched object or the EU-27 Member States. The columns of the table correspond to the initial factors that characterize the phenomenon under study. The initial factors of the study include 12 statistical indicators that directly and indirectly characterize social protection for families with children. Based on the Eurostat database, the latest available statistical

indicators were used, that is, for the year 2020.

The initial factors for each of the EU-27 Member States are as follows:

1. social protection expenditure for families with children, % of GDP;
2. crude birth rate;
3. total fertility rate;
4. infant mortality (per 1000 live births);
5. Gini coefficient;
6. average annual equivalent net income per household (excluding social transfers), EUR;
7. proportion of the number of children at risk of poverty of total number of children up to the age of 18, %;
8. female employment, % of total population;
9. proportion of children under the age of 14 of total population, %;
10. tax revenue (including social contributions), % of GDP;
11. revenue from social contributions, EUR;
12. GDP per capita, EUR.

Step 2. Applying the SPSS software, a correlation matrix was calculated, which shows the relationship or correlation of factors. The data matrix reveals relationship of one factor with some other factor. However, three factors – infant mortality, Gini coefficient and revenue from social contributions – correlate with only one factor, so the authors abandoned the use of these factors in further analysis. In order to prove that the data sample is correct and applicable in further research, the factor analysis was conducted using the Kaiser-Meyer-Olkin and the Bartlett's tests.

The Kaiser-Meyer-Olkin test examines the suitability of variables for the factor analysis. The test value should be greater than 0.5. The Bartlett's test, in its turn, shows the significance of correlations between traits if its significance value is less than 0.05 (Manly, Alberto, 2016).

Table 2
The Kaiser-Meyer-Olkin (KMO) and the Bartlett's Tests Results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.543
Bartlett's Test of Sphericity	Approx. Chi-Square	114.270
	df	36
	Sig.	0.000

The Kaiser-Meyer-Olkin (KMO) test and the Bartlett's test results approve that the constructed data sample is sufficient and the use of factor analysis is appropriate because the KMO exceeds the value of 0.5 and the significance value of the Bartlett's test is less than 0.05 (Table 2).

Step 3. Three sets of factors (groups) with eigenvalues greater than 1 and explaining 73.4% of the variance or possible dispersion between the EU Member States were obtained after the application of the Kaiser-Meyer-Olkin (KMO) test (Table 3).

The first group of complex factors, the eigenvalue of which exceeds 1, explains 38.6% of the total set of variables. The second group of complex factors, in turn, explains 21%, while the third group of complex factors explains 13.8% of the total set of variables.

Step 4. The calculation results of the Component Matrix allow determining elements belonging to the relevant group of factors, assigning the name to the group of factors and evaluating their content. The result of calculation of this matrix showed that almost all indicators, except for the "Tax revenue" indicator, fall under the first group of complex factors. Therefore, the rotated factor matrix was calculated using the Varimax rotation method for a more complete interpretation of the results. Factor rotation is important to simplify the factor structure and facilitate the interpretation of the estimated results (Manly, Alberto, 2016). The results of this method indicate that the elements included in the complex factors are evenly distributed among all three groups of complex factors (Table 4).

According to the calculated factor loadings, all factors in the rotation matrix were grouped consistent with the size of the factor loading coefficient.

The first complex factor, which combines three indicators, is defined as the "Demographic factor" and it describes the demographic situation in the country.

The second complex factor, which combines the largest number of indicators – 4 or 44.4% of their total number, is defined as the "Social factor", since most of the indicators in this group of factors directly describe social protection for families with children. Only the indicator "Tax revenues, % of GDP" is more often classified as an economic indicator; yet, in this analysis, it belongs to the social factor group, since tax revenue is the basis for social transfer payments (pensions and benefits).

The third complex factor, which includes two indicators "Average equivalent net income" and "GDP per capita" is defined as the "Economic factor".

Factors with a higher factor loading value are more representative of their importance in the complex factor. In the first complex factor, the factor "Crude birth rate" has the highest factor loading coefficient (0.883), while the factor "Proportion of children under the age of 14 of total population" has the lowest coefficient (0.811). In the second complex factor, the factor "Proportion of the number of children at risk of poverty of total number of children up to the age of 18" has the largest factor loading coefficient but the value is negative (-0.742), which means that the risk of child poverty decreases with the improvement of the social situation in the country. In the third complex factor, the indicator "GDP per capita" has the highest factor loading coefficient (0.899), which indicates that the level of social protection increases with the increase of this indicator.

A cluster analysis was performed based on the

Table 3

The Result of Factor Group Analysis of Social Protection for Families with Children in the EU Member States (The Year 2020)

Groups of factors	Initial eigenvalues of factors			Inverse sums of square loading		
	Total	Explained variances, %	Cumulative percentage	Total	Explained variances, %	Cumulative percentage
1	3.5	38.6	38.6	3.5	38.6	38.6
2	1.9	21.0	59.6	1.9	21.0	59.6
3	1.2	13.8	73.4	1.2	13.8	73.4

Table 4
The Result of the Matrix Analysis of the Rotated Components for Social Protection for Families with Children of the EU Member States (The Year 2020)

Indicator	Components		
	1	2	3
Demographic factor			
Crude birth rate	0.883		
Proportion of children under the age of 14 of total population, %	0.811		
Total fertility rate	0.828		
Social factor			
Proportion of social protection expenditure for families with children, % of GDP		0.723	
Female employment, % of total population		0.642	
Proportion of the number of children at risk of poverty of total number of children up to the age of 18, %		-0.742	
Tax revenue, % of GDP		0.689	
Economic factor			
Average annual equivalent net income per household, EUR			0.877
GDP per capita, EUR			0.899

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization

Table 5
The Analysis of Variance (ANOVA) for Factors Used in Clustering

Indicators	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
REGR factor score 1 for Analysis 1	5.665	3	0.391	23	14.471	0.000
REGR factor score 2 for Analysis 1	5.375	3	0.429	23	12.522	0.000
REGR factor score 3 for Analysis 1	7.733	3	0.122	23	63.468	0.000

Note: The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this; and thus, cannot be interpreted as tests of the hypothesis that the cluster means are equal

three groups of complex factors obtained in the factor analysis. The EU Member States were divided into several clusters according to the level of social protection for families with children. The cluster analysis was conducted in two stages. In the first stage, the statistical significance of the complex factors was determined, while the number of clusters and their interpretation were identified in the second stage.

The analysis of variance (ANOVA) was performed to determine the statistical significance of complex factors. The analysis of variance showed that all

complex factors are statistically significant, as their significance does not exceed the limit of 0.05 (Table 5).

In a further study, the number of clusters was determined using the Elbow rule. The Elbow's rule is one of the methods that helps determine the optimal number of clusters. (Carreira-Perpinan, 2015). The first step involved the performance of the hierarchical cluster analysis and calculation of the agglomeration schedule. The second step dealt with the creation of the graph of agglomeration schedule coefficients (Fig.1).

As depicted in Figure 1, the total number of steps

(stages) is 26 but a steeper curve has been formed in Step 22. Therefore, it can be concluded that consistent with the Elbow's rule, the optimal number of clusters is 4 ($N=26-22$). Hence, the EU Member States are classified into four clusters using K-means cluster analysis in accordance with the level of social protection for families with children.

Cluster 1 includes only one country – Ireland. Cluster 2 includes four EU Member States – Greece, Spain, Italy, and Malta. Cluster 3 includes the largest (13 countries) number of the EU Member States (Bulgaria, Czechia, Croatia, Cyprus, Estonia, Latvia, Lithuania, Hungary, Poland, Portugal, Romania, Slovenia, and Slovakia), while Cluster 4 includes nine EU Member States (Belgium, Denmark, Germany, France, Luxembourg, the Netherlands, Austria, Finland, and Sweden).

Analyzing the distances between the cluster centers, it can be concluded that Clusters 3 and 4 are the closest ones to each other, while Clusters 1 and 2, and Clusters 1 and 3 have similar inter-cluster distances (Table 6).

The obtained inter-cluster distances evidence the interrelationship of the clusters; the closer clusters can move to the next level at a new classification, and they can form new clusters or groups of clusters.

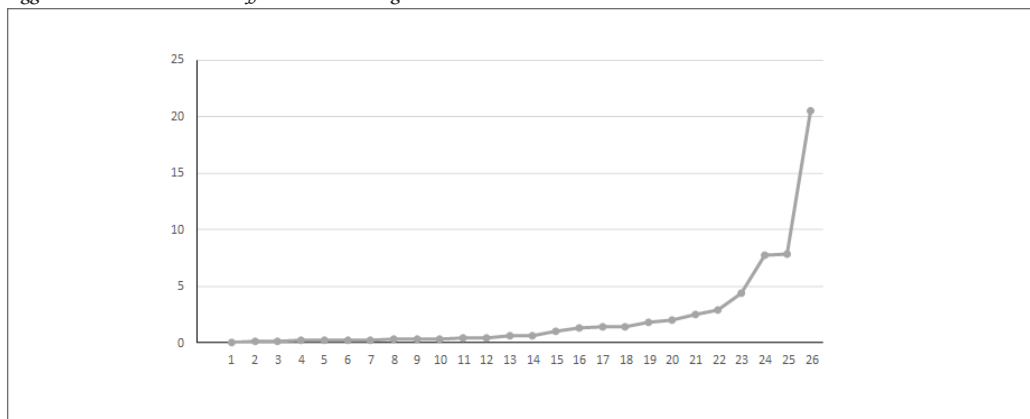
The coordinates of the centers of final clusters were calculated for each cluster (Table 7).

The analysis of cluster centers reveals that both the demographic and the economic factor of Cluster

1, which includes only Ireland, has the highest factor value (above the EU average) compared to the other clusters, which indicates a relatively more favorable demographic and economic situation. The analysis of indicators that belong to the complex group of factors “Demographic factor” allows concluding that the indicators “Crude birth rate” and “Proportion of children under the age of 14 of total population” rank first in the ranking process, while the indicator “Total fertility rate” ranks 6 (1.63) and it follows immediately after Denmark (1.68) and Sweden (1.67). However, it should be noted that the total fertility rate in 2020 in none of the EU Member States has reached at least 2.1, which would ensure the change of generations. The “Social factor”, in turn, has the lowest value among the values of the other clusters. Analyzing the indicators included in this group of complex factors, it can be seen that the indicator “Tax revenue of GDP” ranks the last among the EU Member States, the indicator “Proportion of social protection expenditure for families with children of GDP” ranks in the 24th position and the indicators “Female employment” and “Proportion of the number of children at risk of poverty of total number of children up to the age of 18” rank in the 20th position, which are also among the lowest indicators.

The situation in Ireland may be explained by Nygard et al. (2019) who indicates that the government in Ireland generally spend less on direct cash benefits

Figure 1
Agglomeration Schedule Coefficients According to the Elbow Rule



to families but they envisage more tax allowances for market-based childcare services.

Cluster 2 (Southern Europe – socially and demographically problematic countries) is characterized by a relatively good economic situation, as the value of the complex factor “Economic factor” is above the EU average. Analyzing the indicators included in this complex group of factors, it can be concluded that both indicators “GDP per capita” and “Average equivalent net income” rank in the 2nd and the 4th positions, respectively. Though, it should be noted that the complex factor “Demographic factor” has the lowest value compared to the other clusters. The analysis of the indicators included in this group of complex factors depicts that the values of all indicators rank in the lowest positions, which means that these countries have greater demographic problems compared to the rest of the EU Member States. The value of the “Social factor” is also below the EU average, which evidences that the countries in this cluster have low social security. Analyzing the indicators included in this group of complex factors, it can be seen that the indicators, with the exception of “Tax revenue % of GDP”, rank in the lowest positions.

Cluster 3 (Central Europe, Eastern Europe and Portugal – countries with moderate demographic

development and problems in the economic and social spheres) is characterized by lower economic development compared to the other clusters, as evidenced by the value of the complex factor “Economic factor”, which is below the EU average only in this cluster. So, the countries belonging to this cluster should especially think about the improvement of their economic situation. The value of social factor, in turn, is slightly below the EU average but it is higher than in Clusters 1 and 2. This leads to the conclusion that these countries shall continue to improve their social protection, reaching at least the EU average level. It should be noted that the value of the demographic factor is above the EU average and is slightly higher than for Cluster 4, which shows that the demographic situation is generally similar to the welfare states (Cluster 4).

Cluster 4 (Scandinavia and Western Europe – welfare states) is characterized by the highest level of social protection for families with children compared to the other clusters, since only this cluster has positive values of all complex factors (above the EU average). The analysis of the groups of complex factors discloses that the social factor has the highest factor value compared to the other clusters. The indicators “Proportion of social protection expenditure for families with

Figure 2
Classification of the EU Member States into Clusters When Assessing Social Protection for Families with Children

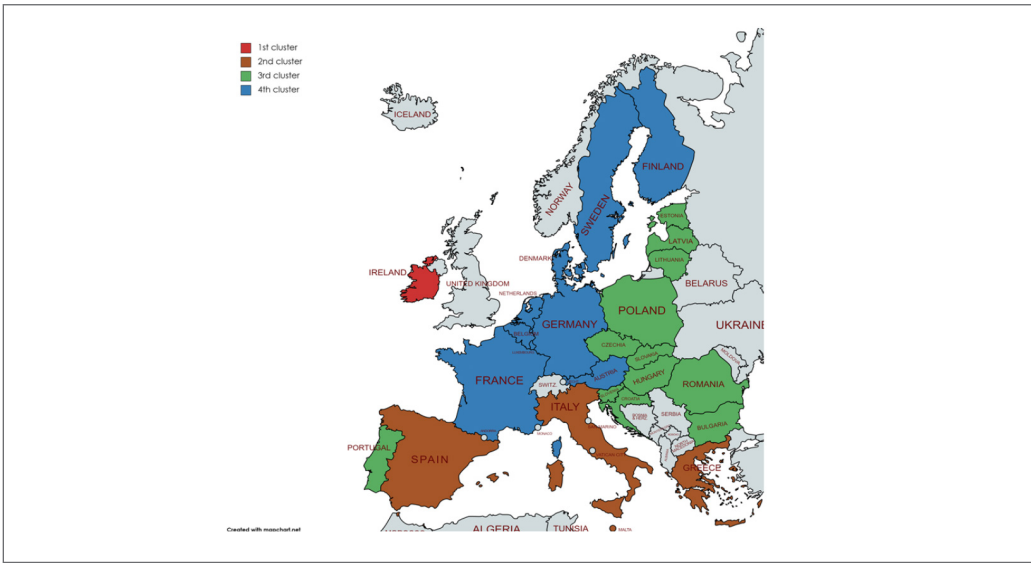


Table 6*Distances Between the Centers of Clusters*

Cluster	1	2	3	4
1	-	4.628	4.549	4.187
2	4.628	-	2.509	2.607
3	4.549	2.509	-	1.931
4	4.187	2.607	1.931	-

Table 7*Centers of Final Clusters for Complex Factors*

Groups of factors	1	2	3	4
REGR factor score 1 for Analysis 1 (demographic factor)	2.09988	-1.68082	0.30959	0.06652
REGR factor score 2 for Analysis 1 (social factor)	-2.44721	-1.05030	-0.03976	0.79614
REGR factor score 3 for Analysis 1 (economic factor)	2.54802	0.27381	-0.87078	0.85298

children of GDP” and “Tax revenue of GDP”, which are included in this group of complex factors, rank high in the ranking process. Consequently, the authors of the present research conclude that countries tax revenue of which forms a larger proportion of GDP are more generous in terms of social protection for families with children.

The results of the authors’ study are consistent with Hajighasemi et al. (2022) recognition that countries that have advanced the most in developing extensive and expensive social security systems are almost always the most developed economies, while countries that have lagged behind or chosen not to invest in progressive social protection are in many cases suffering from financial difficulties.

Fleckenstein, Lee (2020) indicate that social investment policies are increasing worldwide. Although the Nordic countries are generally considered pioneers of social investment policies, the authors acknowledge that other countries in Europe have made significant efforts to catch up the leading countries. The increase of social investment policies, particularly the expansion of family policies, is an important dimension of the recent

transformation of progressive welfare capitalism. However, there are still large cross-national differences in the speed and extent of family policy expansion.

In conclusion, it should be recognized that the cluster analysis carried out by the research authors with the application of the statistical data of 2020, shows that Ireland demonstrates the most significant differences in the level of social protection for families with children among the EU Member States; the differences, yet smaller, are observed also among the other EU Member States.

3. Conclusions

The factors characterizing social protection for families with children identified as a result of the research may be classified into three groups: demographic, social and economic factor groups. The analysis of the groups of factors revealed those factors which leave the greatest impact on social protection for families with children. They include crude birth rate in the group of demographic factors, proportion of children at risk of poverty in the group of social factors and GDP per capita in the group of economic factors.

According to the level of social protection for families with children, the EU Member States can be classified into four different clusters. The EU Member States belonging to Cluster 4 (Scandinavia and Western Europe – welfare states), which spend a larger proportion of expenses on social protection compared to the other countries produce the most generous social protection for families with children. Countries with greater demographic problems and low social protection are in Cluster 2 (Southern Europe); however, the economic situation in this cluster is above the EU average, which indicates insufficient support for families with children. According to the analysis, Ireland, which is the only country included in Cluster 1, has the best demographic and economic situation. However, the social factor has the lowest value among all clusters and its expenditure on social protection is one of the lowest, since the support for families with children is mainly provided in the form of tax benefits, which favorably impacts the demographic situation. Relatively weaker economic and social development is reported by the EU Member States belonging to Cluster 3 (Central Europe, Eastern Europe and Portugal); though, the demographic situation in these countries is above the EU average and it does not significantly differ from the countries belonging to Cluster 4.

Acknowledgement

This paper was prepared with the support of the European Social Fund as part of the project No 8.2.2.0/20/I/001 and within the program "Strengthening Scientific Capacity" of the Latvia University of Life Sciences and Technologies.

References

- Adema, W., Ali N., Richardson D., & Thévenon O. (2014). *Family policy trends in international perspective, drivers of reform and recent development*. <https://epc2014.eaps.nl/papers/140353>
- Balode, I., Krastins, O., & Ciemina, I. (2009). *Sadalijumu apliecosas liknes dzives limena petijumos* (Distribution confirming curves in the studies of living standard). 10-24. https://www.apgads.lu.lv/fileadmin/user_upload/lu_portal/apgads/PDF/LUR-743_Ekon-vad-zinatne.pdf
- Bela-Krumina, B., Eglite, P., Karnitis, E., Kazaks, M., Ozolina, Z., Rivza, B., Svarckopfā, A., Tisekopfs, T., & Usackis, U. Latvijas iedzīvotāju dzives kvalitātes indekss (Quality of life index of the inhabitants of Latvia) (2006), 30. https://ppdb.mk.gov.lv/wp-content/uploads/2023/11/VP_Latv_dzives_kval_indekss.pdf
- Carreira-Perpinan, M. A. (2015). Clustering methods based on kernel density estimators: mean-shift algorithms. In *Handbook of cluster analysis*. 404-439. Chapman and Hall/CRC.
- Ciemina, I. (2009). *Latvijas iedzīvotāju paterina izdevumi un to izmaiņu tendences pēdējā desmitgadē* (Household consumption expenditure and its change trends in the last decade). https://www.apgads.lu.lv/fileadmin/user_upload/lu_portal/apgads/PDF/LUR-743_Ekon-vad-zinatne.pdf
- Daly, M., & Ferragina, E. (2018). Family policy in high-income countries: Five decades of development. *Journal of European Social Policy*, 28(3), 255-270. <https://journals.sagepub.com/doi/abs/10.1177/0958928717735060>
- Devaney, C., Christiansen, O., Holzer, J., MacDonald, M., Matias, M., & Salamon, E. (2023). Child, parent or family? Applying a systemic lens to the conceptualizations of Family Support in Europe. *European Journal of Social Work*, 26(2), 335-347. <https://www.tandfonline.com/doi/full/10.1080/13691457.2022.2146308>
- Eglite, P., Putniņa, A., Brants, M., Mileiko, I., & Laizāne, M. (2013). *Tautas ataudzi ietekmējošo faktoru izpēte* (Analysis of the factors influencing the regeneration of the nation). Gala ziņojums. <https://www.lm.gov.lv/lv/media/4522/download>
- Fleckenstein, T., & Lee, S. C. (2020). Roads and barriers towards social investments: Comparing labour market and family policy reforms in Europe and East Asia. *Policy and Society*, 39(2), 266-283. <https://www.tandfonline.com/doi/full/10.1080/14494035.2019.1688617>
- Gosa, Z. (2009). *Iedzīvotāju ekonomiskās aktivitātes un dzives līmeņa atšķirības Latvijas reģionos un to ietekme uz dzimstību un mirstību* (Differences in economic activity and standard of living of individuals in the regions of Latvia and their impact on birth and mortality). 102-116. https://www.apgads.lu.lv/fileadmin/user_upload/lu_portal/apgads/PDF/LUR-743_Ekon-vad-zinatne.pdf

- Grinfelde, A. (2010). *Life quality of pensioners in Latvian regions* [Summary of doctoral thesis]. Jelgava, 113.
- Hajighasemi, A., Oghazi, P., Aliyari, S., & Pashkevich, N. (2022). The impact of welfare state systems on innovation performance and competitiveness: European country clusters. *Journal of Innovation & Knowledge*, 7(4), 100236. <https://doi.org/10.1016/j.jik.2022.100236>
- Halaskova, R., & Bednar, P. (2020). Relationship of social protection expenditures and socio-economic indicators: A panel data analysis of the EU countries. *Montenegrin Journal of Economics*. <https://doi.org/10.14254/1800-5845/2020.16-2.2>
- Jersova, A., & Kotane, I. (2021). *Assessment of the indicators characterizing the standard of living of the inhabitants in Latvia*. <http://journals.rta.lv/index.php/ISS/article/view/6698>
- Latviete, I. (2012). *European Social Fund Financing in the Welfare Sector in the Regions of Latvia*. Summary of doctoral thesis. Jelgava, 128.
- Latvijas Republikas Saeima. (2022). *Pabalstu par bernu audzināšanu noteikšana Baltijas jūras reģiona* (Determination of benefits and allowances for raising children in the Baltic Sea region) LR Saeimas apskats. https://www.saeima.lv/petijumi/Pabalstu_par_bernu_audzinasanu_noteikšana.pdf
- Latvijas Universitāte. (2020). *Latvija. Parskats par tautas attīstību 2019/2020*. Latvijas eiropeizācija. (Latvia. Human Development Report 2019/2020. Europeanization of Latvia.) https://www.lu.lv/fileadmin/user_upload/LU.LV/www.lu.lv/Zinatne/TAP-LV_2019_2020_LatvijasEiropizacija_final.pdf
- Manly, B. F., & Alberto, J. A. N. (2016). *Multivariate statistical methods: a primer*. Chapman and Hall/CRC, 269.
- Mezs, I. (2013). *Demografija un nabadzība ģimenēs ar bērniem* (Demography and poverty in families with children). Parskats par tautas attīstību 2012/2013. Ilgtspējīgā nācija, 45-54. <https://dspace.lu.lv/dspace/bitstream/handle/7/2842/TAP-makets2013.pdf?sequence=1&isAllowed=y>
- Millere, J. (2012). *Bērnu ar invaliditāti ģimēnu dzīves kvalitāte Latvijā* (Quality of life of families with children with disabilities in Latvia). Promocijas darbs. https://www.rsu.lv/sites/default/files/disertations/JMillere_Disertacija.pdf
- Nygard, M., Lindberg, M., Nyqvist, F., & Hartull, C. (2019). The role of cash benefit and in-kind benefit spending for child poverty in times of austerity: An analysis of 22 European countries 2006–2015. *Social Indicators Research*, 146, 533–552. <https://doi.org/10.1007/s11205-019-02126-8>
- Oficīnālās statistikas portāls. (2023a) Consumer price index (2023).. <https://stat.gov.lv/lv/statistikas-temas/valsts-ekonomika/paterina-cenas/2296-paterina-cenu-indeks>
- Oficīnālās statistikas portāls. (2023b). Dzimuso skaits un dzimstības koeficienti (2023). (Number of births and birth rates). <https://stat.gov.lv/lv/statistikas-temas/iedzivotaji/dzimstiba/238-dzimuso-skaits-un-dzimstibas-koeficienti>
- Onambele, L., San-Martin-Rodríguez, L., Niu, H., Alvarez-Alvarez, I., & Arnedo-Pena, A., Guillen-Grima, F., Aguinaga-Ontoso, I. (2019). Infant mortality in the European Union: A time trend analysis of the 1994–2015 period. *Anales de Pediatría (English Edition)*, 91(4), 219–227. <https://doi.org/10.1016/j.anpede.2019.03.002>
- Pezer, M. (2022). Public policies supporting families with children across welfare regimes: An empirical assessment of six European countries. *Journal of European Social Policy*, 32(3), 254–269. <https://doi.org/10.1177/09589287221080700>
- Pezer, M. (2023). How could Croatia reform tax-benefit policies for families with children: tackling distributional effects. *Economic Research-Ekonomska Istraživanja*, 36(2), 2140303. <https://www.tandfonline.com/doi/full/10.1080/1331677X.2022.2140303>
- Sumner, A. (2004). *Economic Well-being and Non-economic Well-being*. A Review of the Meaning and Measurement of Poverty, 30(49), 33–50. <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=b3d4b57cbd4d2b79f9de07bdc4ca48dab3f6ab5a>
- Vanaga, R., & Sloka, B. (2022). *Sociālā aizsardzība un ienākumu nevienlīdzība* (Social protection and income inequality). Monografija: Latvijas speks ilgi pastāvēt, 161–171.