APPROACHES TO THE EVOLUTION OF THE SOCIAL CONTEXT THROUGH THE LENS OF THE SOCIAL INSURANCE BUDGET EFFORT IN ROMANIA. REALITIES AND PERSPECTIVES

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Abstract. The social context in Romania is determined by the issue of the degree of social security, through the budgetary effort in a context of rising inflation and elements of geo-political instability manifested by recession and social insecurity, especially for the low-income population. The objective of the study is to identify the current situation affecting the social status of citizens in Romania and the prospects for its evolution by introducing a social security index based on statistical and econometric forecasting methods. The methods used are of an empirical nature represented by the study of the specialized literature and of an analytical nature, respectively the consolidation of databases, econometric modelling, prospective analysis and economic forecasts. The results of the study are useful for national decision-makers in order to adjust social policy elements in line with the sustainability objectives agreed at European level and in relation to the growing needs of the population at risk of poverty, continuing inflation and economic recession.

Keywords: *social protection, social security index, economic recession, social contributions, econometric model.*

Rezumat. Contextul social din România este determinat de problematica gradului de securitate socială, prin efortul bugetar într-un context de inflaţie în creştere şi elemente de instabilitate geo-politică manifestate prin recesiune şi insecuritate socială, în special pentru populaţia cu venituri mici. Obiectivul studiului este de a identifica situaţia actuală care afectează statutul social al cetăţenilor din România şi perspectivele de evoluţie a acestuia prin introducerea unui indice de securitate socială bazat pe metode de prognoză statistică şi econometrică. Metodele utilizate sunt de natură empirică reprezentate de studiul literaturii de specialitate şi de natură analitică, respectiv consolidarea bazelor de date, modelarea econometrică, analiza prospectivă şi previziunile economice. Rezultatele studiului sunt utile factorilor de decizie naţionali în pentru a ajusta elementele de politică socială în conformitate cu obiectivele de durabilitate convenite la nivel european şi în raport cu nevoile tot mai mari ale populaţiei expuse riscului de sărăcie, inflaţie continuă şi recesiune economică.

Cuvinte cheie: *protecție socială, indice de securitate socială, recesiune economică, contribuții sociale, model econometric.*

1. Introduction

In the broader macroeconomic context, the objectives of social policy at European level are to ensure social equity and equal opportunities with an impact on all sectors of activity by promoting social equality and protection of European citizens in relation to critical events (pandemic, economic crisis, unemployment, etc.). In the other direction, at the level of the Romanian national economy, which has adhered to the European objectives but from the point of view of social protection measures is somewhere below the European average, the economic status during the crisis period has made the social status vulnerable both by increasing unemployment and especially by increasing infancy which has reduced by about 30-40% the welfare of the population in the context of rising prices of utilities, energy and consumer goods.

On the other hand, fiscal policy aimed at reducing the budget deficit of 8% of gross domestic product (GDP) has not favoured the elements of social protection included in national strategies and policies. The vulnerable external environment and the domestic environment eroded by the recession manifested itself in the adjustment of the monetary policy conduct by the National Bank of Romania in a prudent manner, and the ROBOR (Romanian Interbank Offer Rate) continued its perpetual upward trend, making social policy even more vulnerable and accentuating the poverty of the population earning below the national average.

In this context, we define the following study objectives for the purpose of the study, i.e. the identification of a viable tool for the development of social security policies:

O1: identifying social security models in the literature or proposals for their improvement in crisis conditions;

O2: dissemination of working hypotheses based on results from the literature;

O3: building and strengthening the evidence base with relevant indicators to support modelling of social security status;

O4: defining the social security index;

O5: dissemination of the results.

The study continues with a brief presentation of the main approaches of the problems studied in the literature, with the presentation of the working methodology, the results and the conclusions of the research.

2. Literature Review

The specialized literature presents a series of interesting debates on the studied topic. The financial effort to cover the social need is at the forefront of the researchers, being recognized several models for assessing the effectiveness of allocations.

According to a study conducted by the European Commission [1] at the level of the European economy, social protection measures are approached differently, there are 3 cores, which show a constant allocation between 2005-2016, as follows: - countries such as Austria, Belgium, Denmark, Germany, France and Sweden [2-5], maintain a high level of allocation to social protection of the amounts collected to the general budgets of the Member States, with the mention that during this period other countries such as Italy and the Netherlands have changed their social protection policy and joined this core of high spenders.

The middle core of countries such as Portugal, Slovenia, Luxembourg [6-9], which were later joined by Spain, Greece, Croatia, maintain an average level of allocation.

The last core, characterised by a low level of allocations for social protection, comprises most countries: Bulgaria, Cyprus, Czech Republic, Estonia, Latvia, Lithuania, Malta, Poland, Romania and Slovakia, plus Hungary [2, 10-13] towards the end of the period.

The level of social protection [14, p.1] as a percentage of GDP, is for Romania about 50% of the European average, decreasing as a share in the dynamics between 2009 and 2016, so if in 2009, Romania allocates 16% of GDP for social protection measures, in 2016, the allocated level is 13.7% against 28.1% European average.

The real cost of social security is assessed by some authors [15, p.131] as the impact of property risk through the prism of financial security measures. A correct valuation of assets provides a measure of net liability, which in relation to the need for social protection partly ensures the liabilities of the system on contributions collected during the working life of citizens.

Another research [11, p.464] analyzes the trajectories of pension systems in Romania and Bulgaria over a period of 20 years, concluding that the Romanian pension system provides moderate social protection, being financed from social contributions collected at high rates, with a small investment component. The study suggests that under the impact of the crisis, pension systems are threatened by upstream accumulated budget deficits and the social security curve is shifting towards the deficit zone [16, p.612].

Other authors [17, p.90] identify as a future threat to the pension system the continuous reduction of the working population and the increase in the number of pensioners with negative effects on social protection budgets.

Economic convergence in the European Union (EU) [18, p.191] under the impact of economic crises is difficult to achieve. There are views at the European level on the introduction of cooperative relationships of European national economies, with the help of European governance interventions, thus the consequences on the social protection sector are significant. There is a division of Europe in terms of social protection [1, 14, 19], division that in the author's opinion is based on the economic capacity of European Member States, there are 2 clusters, that of developed and developing countries.

In a research conducted for the World Bank [20, p.1] the authors analyze the social dimension in dynamics, for the period 2012-2017, showing that social protection is a subject better covered than education or health. At the level of 2016 allocated 11.4% of GDP, while 2.8% allocated to education and 4.0% to health, the structure of social protection meeting the needs of the elderly, unemployed, parents and situations of temporary incapacity for work. In addition, social security in Romania extends to the protection of children and young people, as well as to poor families.

3. Materials and Methods

Starting from the public data reported at centralized level in Romania, we used the following main economic and financial indicators represented by: the total revenues of the general consolidated budget; the current revenues of the general consolidated budget; the capital revenues of the general consolidated budget; the total expenditures of the general consolidated budget; current expenditures of the general consolidated budget; the capital expenditures of the general consolidated budget; the surplus/deficit of the general consolidated budget expressed in millions of euro. The following demographic indicators:

Population aged 15 years and over, of which: active population, employed population, of which: employees, unemployed, inactive population aged 15 years and over (pensioners and social assistance recipients, pupils, students, homemakers) expressed in thousands of persons. Social security indicators: average monthly cost (EURO/employee) expressed in thousands of persons and insurance contributions to the general consolidated budget. The analysed period covered 2010-2020. We conducted an econometric model to determine the contribution correlation based on the least squares method and multiple linear regression using Statistical Product and Service Solutions (SPSS) software according to the formula:

$$InsuranceContribution^{\wedge} = \sum_{i=1}^{10} \propto_i \cdot x_i \qquad (1)$$

All abbreviations and explanations for mathematical formula showed in table 1:

Table 1

Abbreviations and explanations for mathematical formulas

Type	Abbreviations	Explanations	Unit of measurement
Dependent regression variable	InsuranceContribution^	The adjusted level of contributively expressed by the amount of social security contributions paid to the general consolidated budget	Millions of euro
Independent regression variables (Xi)	BTotalIncome	Total revenue of the general consolidated budget	Millions of euro
	BCurrentIncome	Current revenue of the general consolidated budget	Millions of euro
	BCapitalIncome	Capital revenue of the general consolidated budget	Millions of euro
	BCapitalExpenditures	Capital expenditure of the general consolidated budget	Millions of euro
	Bdeficit	The surplus/deficit of the general consolidated budget	Millions of euro
	15YOEmployedPopulation	Active population aged 15 and over	
	15YOEmployee	Employees population aged 15 and over	Thousands of persons
	15YOUnemployed	Unemployed population aged 15 and over	Thousands of persons
	15YOInactivePopulation	Inactive population aged 15 years and over (pensioners and social assistance recipients, pupils, students, homemakers)	Thousands of persons
	AverageMonthlyEmployeeCost	Insurance contributions to the general consolidated budget	EURO/ employee
i		Number of regression variables	

$\propto_i$	Regression coefficients
SSI	Social Security Index

By applying the linear regression modelling method, after calculating the unstandardized β coefficients, the model equation becomes:

$$
\begin{aligned}
InsuranceContribution\char`^ \\
= -0.687 \cdot BTotalIncome + 1.655 \cdot BCurrentIncome - 167.061 \\
\cdot BCapitalIncome - 0.382 \cdot BCapitalExpenditures - 0.079 \\
\cdot Bdeficit + 9.993 \cdot 15YOEmployedPopulation - 6.782 \\
\cdot 15YOEmployee + 9.289 \cdot 15YOUnemployed + 1{,}672 \\
\cdot 15YOInactivePopulation + 27576788.592 \\
\cdot AverageMonthlyEmployeeCost - 74529.627
\end{aligned} \tag{2}
$$

The model summary (Table 2) shows that there is significant statistical agreement between the dependent variable and the instrumented variables of the model, the authors applied the enter method for testing the validity of the data series, with the result that no variable was excluded.

Table 2

Summary of the econometric model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
SSI	1.000[a]	1.000	1.000	0.000	1.000	0.000[b]

Note: a. Predictors: (Constant), AverageMonthlyEmployeeCost, 15YOEmployedPopulation, Bdeficit, BCapitalIncome, 15YOInactivePopulation, BCurrentIncome, BCapitalExpenditures, 15YOUnemployed, 15YOEmployee, BtotalIncome; [b]. Dependent Variable: InsuranceContributions

The analysis of variance (ANOVA test) allows the validation of the alternative hypothesis and the rejection of the null hypothesis by applying the one-sided critical probability test in which the Sig coefficient is less than the value of the reference coefficient 0.005. The test results are shown in the below table 3:

Table 3

Application of the ANOVA method

	Model[a]	Sum of Squares	df	Mean Square	F	Sig.
	Regression	230788698.182	10	23078869.818	0	0.000[b]
SSI	Residual	0.000	0			
	Total	230788698.182	10			

Note: [a]. Dependent Variable: InsuranceContributions; [b]. Predictors: (Constant), AverageMonthlyEmployeeCost, 15YOEmployedPopulation, Bdeficit, BCapitalIncome, 15YOInactivePopulation, BCurrentIncome, BCapitalExpenditures, 15YOUnemployed, 15YOEmployee, BtotalIncome

The proposed social village assessment model confirms that vulnerabilities propagate at the social policy level in tandem with group vulnerabilities that affect economic development as a whole, thus constituting a barrier to the operationalization of policies, to

the fruition of efforts to improve social status and to an accumulated welfare deficit of the Romanian population.

4. Results and Discussion

The diagrams made during the modelling show the variations in the form of clusters at the level of the period analysed in terms of income, these being situated in 2 clusters with a positive trend for the years 2011, 2014, 2019 and a decreasing trend for the years 2012 and 2020 according to Figure 1.
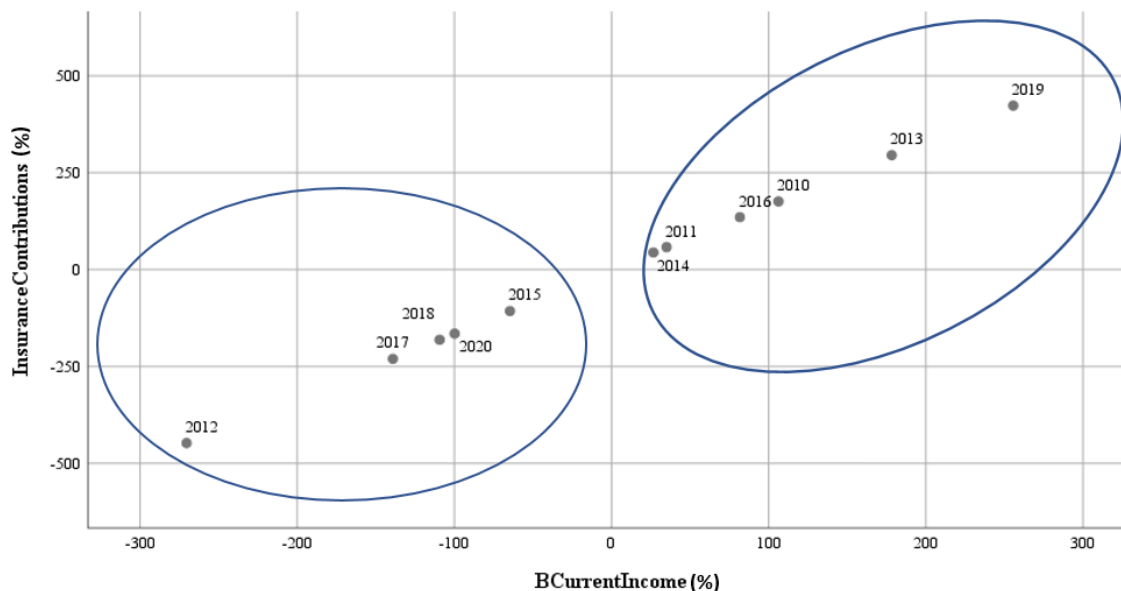

Figure 1. Partial correlation diagram of the dependent variable indicator InsuranceContributions in relation to the regressor BCurrentIncome during 2010 – 2020.
Source: Elaborated by authors.

The deficit policy has been similar throughout the period under review, with Romania consistently running a budget deficit as shown in the figure, which has worsened the social protection aspects.
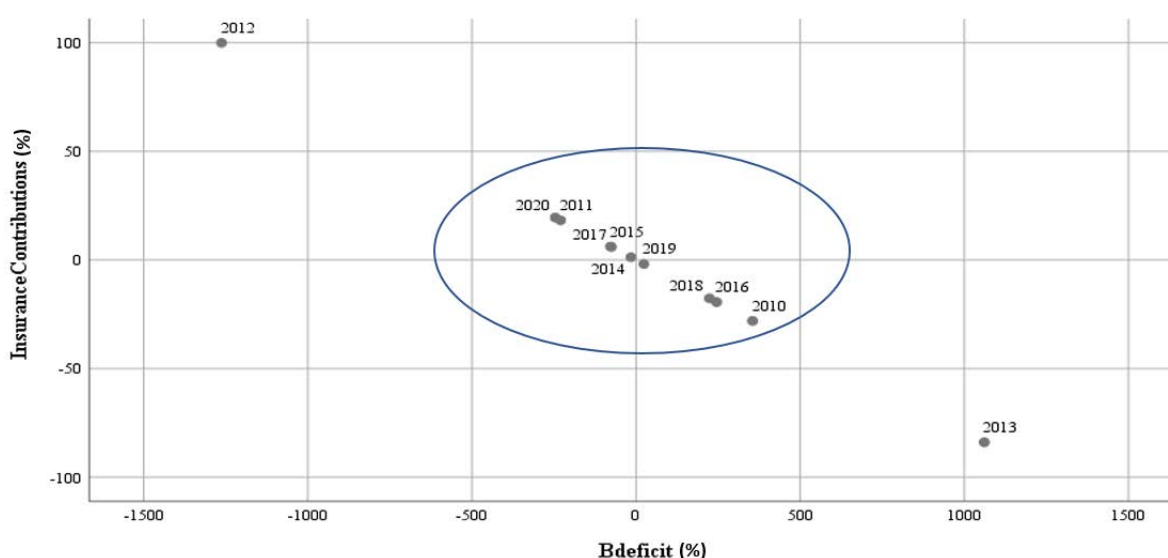

Figure 2. Partial correlation diagram of the dependent variable indicator InsuranceContributions in relation to the regressor Bdeficit during 2010 - 2020.
Source: Elaborated by authors.

At the level of personnel policy, there are significant influences at the level of three clusters, i.e. the deficit zone from the crisis years 2010, 2013, 2014 and a stability zone from 2017. The neutral zone is the one in the middle where the correlation with social protection reaches the median value of the interval.
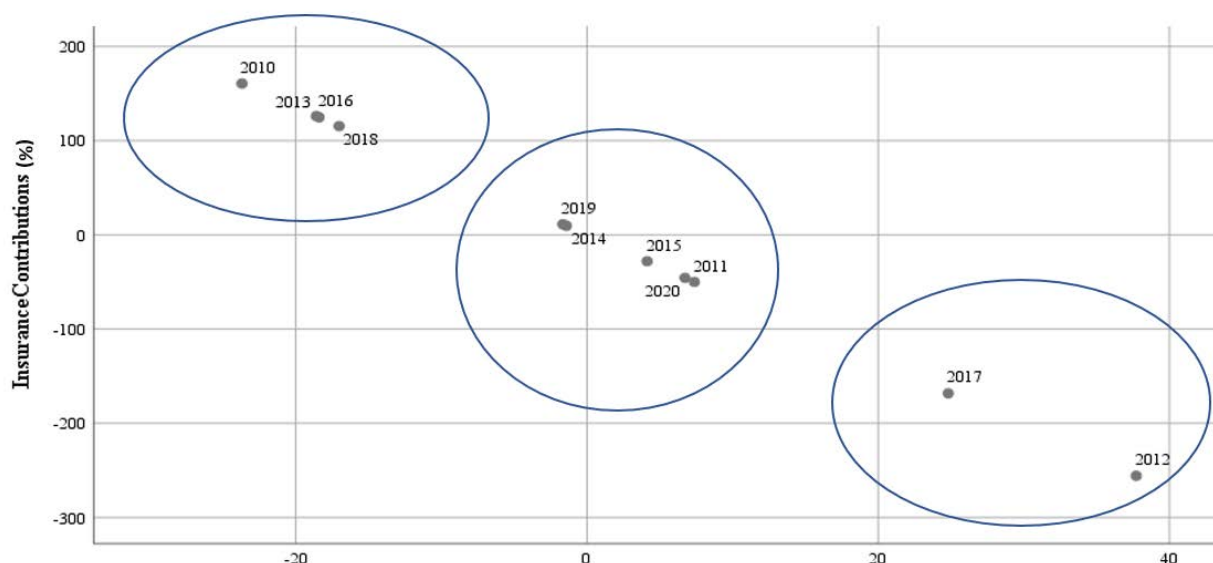

Figure 3. Partial correlation plot of the dependent variable indicator InsuranceContributions against the regressor 15YOEmployee during 2010 - 2020.
Source: Elaborated by authors.

Based on the Pearson correlation coefficients calculated during the modelling, we projected the social security index based on a multiplicative model as follows:

$$
\begin{aligned}
SSI = \; & 0.951 \cdot \frac{BTotalIncome_n}{BTotalIncome_{n-1}} \cdot 0.904 \cdot \frac{BCurrentIncome_n}{BCurrentIncome_{n-1}} : 0.306 \\
& \cdot \frac{BCapitalIncome_n}{BCapitalIncome_{n-1}} \cdot 0.957 \cdot \frac{BTotalExpenses_n}{BTotalExpenses_{n-1}} \cdot 0.963 \\
& \cdot \frac{BCurrentExpenses_n}{BCurrentExpenses_{n-1}} \cdot 0.932 \\
& \cdot \frac{BCapitalExpenditures_n}{BCapitalExpenditures_{n-1}} : 0.542 \cdot \frac{15YOPopulation_n}{15YOPopulation_{n-1}} : 0.742 \\
& \cdot \frac{15YOActivePopulation_n}{15YOActivePopulation_{n-1}} \cdot 0.202 \\
& \cdot \frac{15YOEmployedPopulation_n}{15YOEmployedPopulation_{n-1}} \cdot 0.807 \cdot \frac{15YOEmployee_n}{15YOEmployee_{n-1}} : 0.91 \\
& \cdot \frac{15YOUnemployed_n}{15YOUnemployed_{n-1}} : 0.356 \cdot \frac{15YOInactivePopulation_n}{15YOInactivePopulation_{n-1}}
\end{aligned}
\tag{3}
$$

As can be seen, the value of the security index is sensitive to periods of uncertainty and an asymptotic evolution curve with a slightly increasing trend observed, characterized by the trend equation:

$$
y = -0.0084 \cdot x^2 + 33.919 \cdot x - 34205
\tag{4}
$$

By applying the formula the following structure of the security index is obtain for Romania for the period 2010 - 2020:
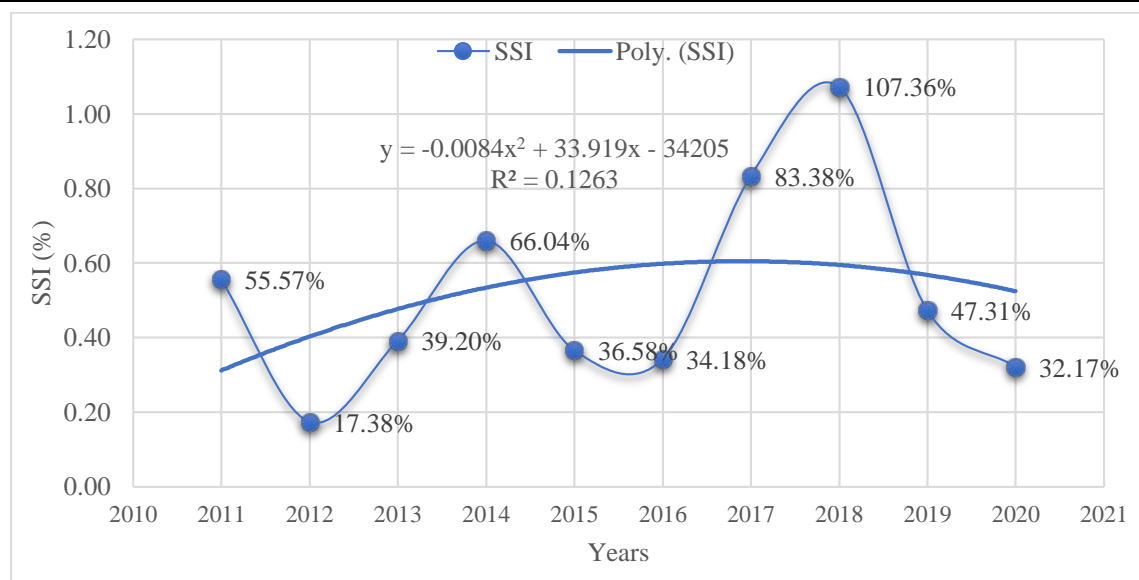
Figure 4. Structure of the social security index.
Source: Elaborated by authors.

From an observational point of view, the social security index represents a scale of social status manifested at the level of an economy, through its ability to reimburse citizens for security in times of welfare hardship and to guarantee welfare in times of economic growth. The proposed index is useful not only to x-ray social status but also to assess the efficiency and effectiveness of social security policies in relation to the objectives proposed by policy makers.

5. Conclusions

Through the conducted research, we achieved the study objectives, calculating the social status based on the multiple correlation ratio of the model indicators that were determined as valid and homogeneous with maximum and homogeneous statistical representativeness. We determined as a novel element of the study the value of the social security index that reaches after an oscillating evolution the maximum point in 2018 highlighting the vulnerability of the social status in relation to the elements of uncertainty and crisis in the economy.

The authors believe that the calculation of the index by policy-makers in making appropriate adjustments to social protection policies with a view to maintaining a higher level of social protection in times when the climate of uncertainty affects the well-being of citizens in particular.

The limitations of the study consist in applying the social security index only to the Romanian economy for a relatively limited period, only 10 years. The authors propose to extend the calculation of the index to other European economies with the application of the calculation formulas over a longer period in order to increase the relevance and improve the conclusions drawn.

Conflicts of Interest. The authors declare no conflict of interest.

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