

Study on the Influence of Economic and Social Factors on the Financing of National Defense

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Abstract

In the Romanian literature and current research, the financing of national defense is a less debated topic. Most studies are conducted mainly for developed countries, which also have the most advanced military systems and focus only on the correlation between military spending and the economy.

The objective of the paper is to investigate the correlation between the evolution of military spending in Romania during 1919-2012 on the one hand, and economic, political and social factors, on the other.

The empirical study performed used the linear regression model, estimated by the least squares method (OLS), using the statistical software EViews 10.

The results of the study showed that the level of financial allocations to the defense budget were largely influenced by the level of economic and social development of Romania during the research period as well as by the options of political decisions.

Key words: national material capabilities; military spending; regime type; economic growth

J.E.L. classification: H11; H50; H53; H56.

1. Introduction

It is important for all nations to know the benefits of the democratization process, with all the civil rights and opportunities for economic development that flow from the political system. In addition to the fact that it is important to understand the social needs that determine the transition to democracy, it is equally important to understand the factors that restrict or allow the consolidation of democracies. In his work (Brauner, 2015, p. 75) considers military power to be a factor influencing both the democratization of states and economic development.

The army is a tool of force, which can be likened to a double-edged sword. On the one hand, in the case of authoritarian or semi-democratic regimes, the army can be used as an instrument of undermining, repressing and consolidating power - there have been many cases when the army (or with their help) staged coups, the most recent being the removal from power of the President of Egypt - Morsi, by the army in July 2013 (Kirkpatrick, 2013). On the other hand, in the case of democratic regimes, the army is itself the guarantor of democracy, constitutional sovereignty and national freedom.

Being an important and sensitive factor at the same time, quite little investigated in the specialized economic literature, we set out to research the budgetary financing of the Romanian Army in the period 1919-2012 as well as the correlation between the military system, indicators that define the resources and capabilities of the national economy, (National Material Capabilities, 2020), and the political regime.

The data needed for the empirical study on defense financing as well as national economic capabilities were collected / processed from the Organizations' website: Correlates of War (COW), Stockholm International Peace Research Institute (SIPRI), Freedom House Index and Polity IV/V.

Data on the democratic regime and the quantification of the level of democracy are represented by the indicator *lexical index*, defined on the platform Harvard Dataverse, which quantifies the level of democracy through a series of necessary conditions defined by 5 sub-indicators.

The research includes the period between the First World War and the year 2012. This interval was used, due to the limited availability of data on specialized platforms.

2. Literature review

Regardless of the political regime, the main role of the army is to guarantee and ensure national peace and security in a state. However, too high a level of military power can be a very sensitive issue in both authoritarian and democratic states (Brauner, 2015).

Acemoglu (Acemoglu, Ticchi, & Vindigini, 2010) defines the army as a key factor in the survival of a dictatorship, but at the same time says that a strong army is also the main threat to power.

Through his study (Leon, 2010) investigates the effect of military spending on the risk of a coup. The study analysed a group of 153 countries for the period 1963-1999 and found that military spending has a negative effect on the likelihood of coups.

As for the armies of democratic states, it is known today *the principle of political control over the armed forces*, principle rooted in representative democracies (NATO, 2008). This principle refers to the supremacy of civilian institutions, through popular sovereignty, over the security apparatus, including over military leadership. In a democracy, there are strong constitutional guarantees that protect the state - including the armed forces - from two types of potential dangers: politicians who have military ambitions, and soldiers who have political ambitions.

Maintaining too high a level of military power, without threats or a high security risk, cannot be an effective measure in the case of democratic or authoritarian regimes. Politics, budget planning and defense must work together effectively to prevent a new "arms race" that is virtually a brake on the economy. (Roland, 2006). In democratic states, policy defines strategy and maximizes military capabilities within given resources, discouraging any threats and, if necessary, forcibly defending territorial integrity.

From an economic point of view, military spending can have two effects (Rahman & Siddiqui, 2019): the effect of supply and demand. The demand effect consists in the fact that the military system increases the demand for goods, services, materials, equipment from the economic environment; it creates jobs and indirectly contributes to economic progress. The supply effect, from the point of view of opportunity cost theory, takes into account the following aspect: if military spending increases and accounts for a large part of a state's budget, then this will impoverish other government sectors, will affect investment and capital in civil economic activities (Tao, Glont, Li, Lobont, & Guzun, 2020).

On the other hand, economic development can have adverse effects on military budgets (Chang, Huang, & Yang, 2011). Thus, a prosperous economy could provide more funds and resources for both defense budgets and other public services (Alexander, 1990). In any case, economic growth does not mean an increase in military budgets at the same time (Tao, Glont, Li, Lobont, & Guzun, 2020).

3. Research methodology

The objective of the study is to highlight the economic situation of the army and to determine the dynamic correlations that existed between military power and economic and social and political indicators in Romania during the period 1919-2012. The study took into account the way the army is financed, the correlation between the military system and the indicators that define national economic resources and capabilities (National Material Capabilities, 2020), as well as the political regime.

A database composed of indicators was built, taken from open sources, as well: Correlates of War (COW), Stockholm International Peace Research Institute (SIPRI), Harvard Dataverse, Freedom House Index and Polity IV/V, NATO, UE, OSCE.

Since data were collected from different sources, their simultaneous availability was possible only in the period between the First World War and 2012.

The basic empirical specification transposes the selected indicators into variables and has the following general regression equation:

$$Milex_{it} = \alpha + \beta_1 x Mileper_{it} + \beta_2 x GDP_{it} + \beta_3 x PEC_{it} + \beta_4 x LEXICAL_INDEX_{it} + \beta_5 x IRST_{it} + \beta_6 x CINC_{it} + \beta_7 x TPOP_{it} + \beta_8 x UPOP_{it} + \varepsilon_{it} \quad eq(1)$$

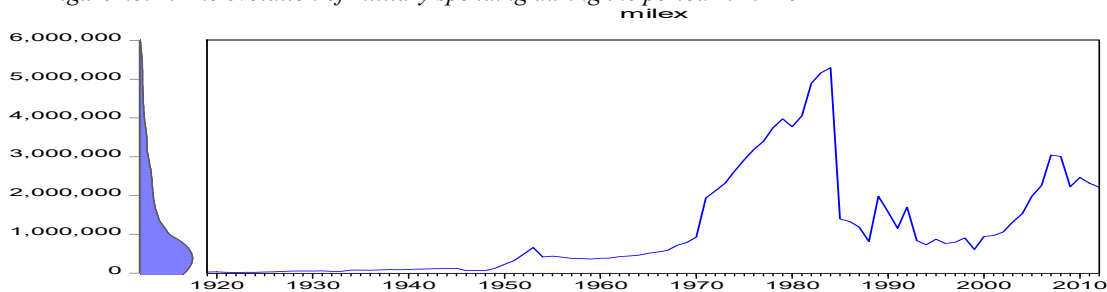
where i represents the country (Romania), t represents the years (from 1919 to 2012), α represents the constant, and ε it represents the error term.

Based on the equation, the causality between military spending and economic and social and political indicators considered was determined.

The continuation of the study presents the evolution of the indicators used, as follows:

- Military spending (milex) - thousands of dollars this year:

Figure no. 1. The evolution of military spending during the period 1919-2012

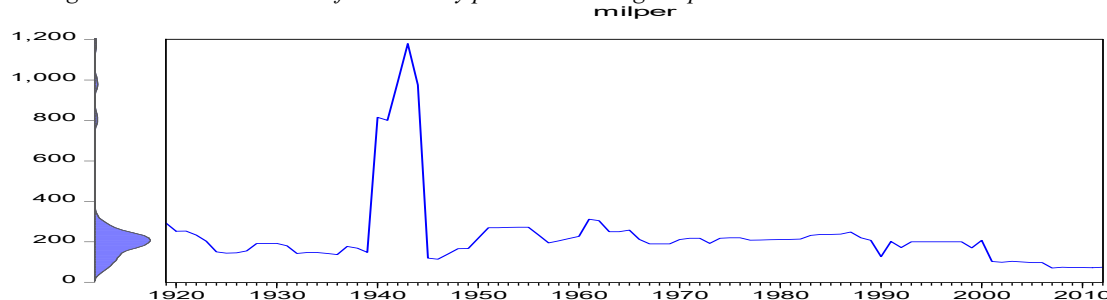


Source: authors' own processing

It is found that this value of this indicator increased constantly, registering the highest levels between 1970-1987, a period in which the leading regime was of the socialist type.

- Military personnel (mil pers):

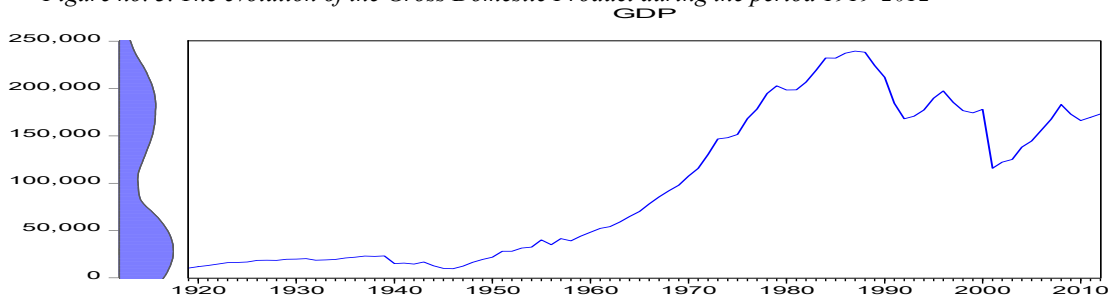
Figure no. 2. The evolution of the military personnel during the period 1919-2012



Source: authors' own processing

It is observed that this indicator registered an average density around about 200,000 soldiers between the periods 1920-1939, 1946-2000, registering the highest level between the years 1940-1945, a period that coincides with the Second World War. It is also observed that after the year 2000, the number of soldiers decreased, due to the pre-accession processes to NATO, and the transition from the concept of compulsory army to a professional army on a voluntary basis.

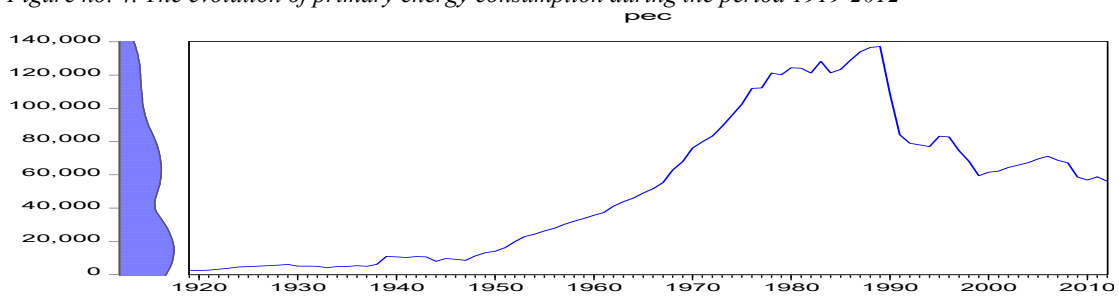
- Gross domestic product (GDP) million dollars this year;
Figure no. 3. The evolution of the Gross Domestic Product during the period 1919-2012



Source: authors' own processing

The indicator recorded an average density of around \$ 45,000 million between 1920-1965; and an average density of \$ 175,000 million between 1966-2012; registering the highest values between 1985-1988, a period that coincides with the socialist regime's effort to pay Romania's foreign debts.

- Primary energy consumption (pec) - thousands of tons of coal (or equivalent);
Figure no. 4. The evolution of primary energy consumption during the period 1919-2012

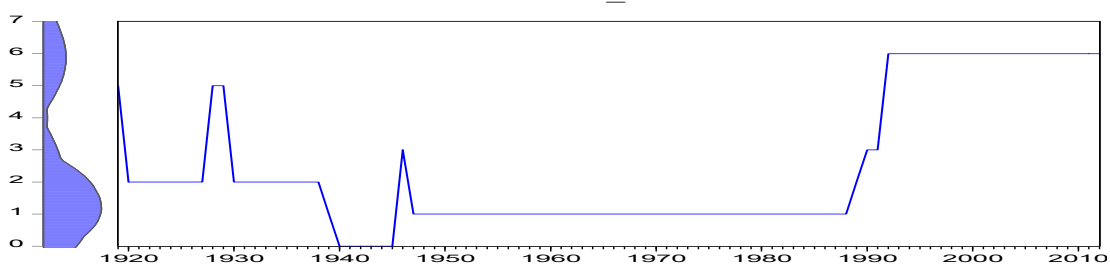


Source: authors' own processing

It is observed that the highest level of average density of this indicator was registered between the periods 1960-1990; period that coincides with the accelerated pace of industrialization existing in Romania.

- *the democracy index* (lexical_index) – a score from 0 to 6 (0 for authoritarian regimes, and 6 for fully democratic regimes)

Figure no. 5 The evolution of the Lexical index indicator during the period 1919-2012

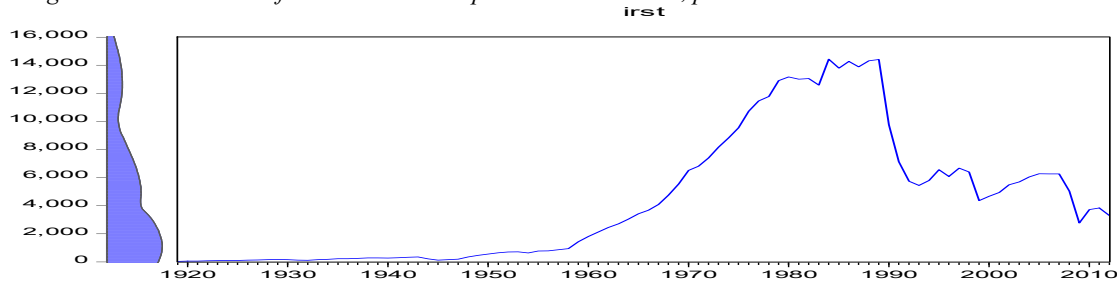


Source: authors' own processing

From the evolution of the indicator that reflects the level of democracy during the period included in the research, it is found that in the period of constitutional monarchy, the density is around 2, with a maximum level of 5 between 1928-1929 and a minimum level between 1940 -1 945. During the socialist regime, this indicator was constantly around the value of 1. In the period 1990-1991, the indicator was at the value of 3 and since 1992 the indicator is constantly at the figure of 6, which means a completely democratic level.

- Production of iron and steel (irst) - thousands of tons;

Figure no. 6. Evolution of the iron and steel production indicator, period 1919-2012

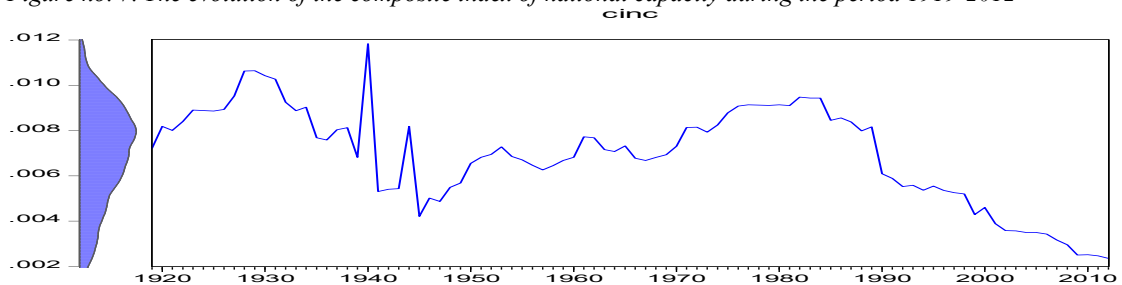


Source: authors' own processing

The indicator registered an accelerated growth starting with 1950, which continued until 1988, a period that coincides with the massive industrialization in Romania. Since 1990, the production of iron and steel has steadily decreased to an average density of 2,000 thousand tons per year.

- Composite index of national capacity (cinc) - represents a calculated score:

Figure no. 7. The evolution of the composite index of national capacity during the period 1919-2012

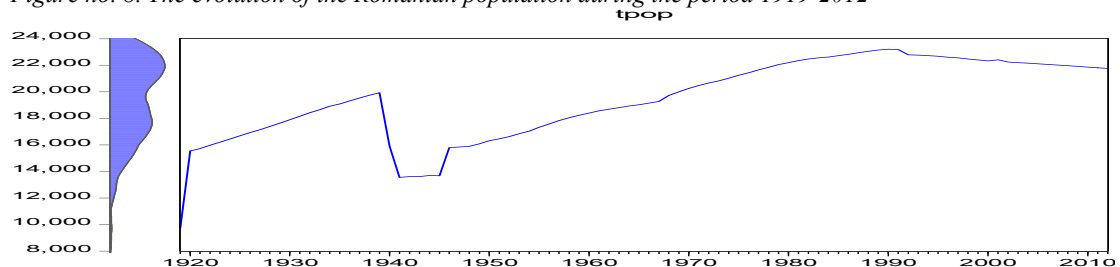


Source: authors' own processing

The index had an average density around 0.008, in the period 1920-1990. Since 1991, the level of the index has been steadily declining.

- Total population (tpop) - thousands of people;

Figure no. 8. The evolution of the Romanian population during the period 1919-2012

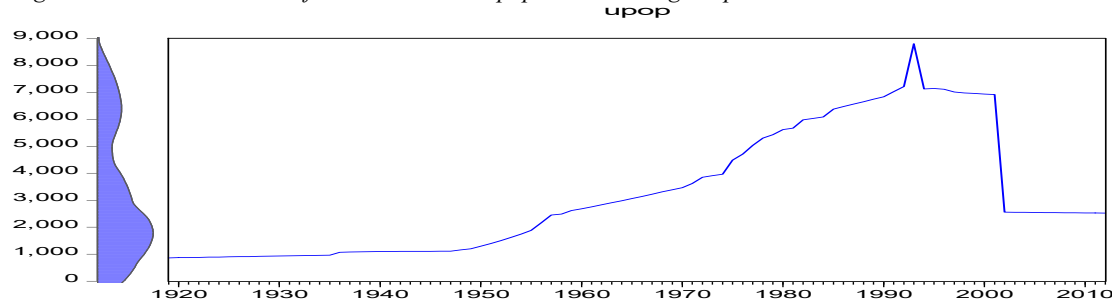


Source: authors' own processing

Around 1920, the population of Romania registered a significant increase, mainly due to the National Union and the registration of the entire population. In the periods 1921-1939 and 1947-1990, the population of Romania registers continuous growth and in the period 1940-1945 the population registers decrease due to the conditions caused by the war. Starting with 1991, the Romanian population registers decreases until the end of the period included in the research.

- urban population (upop) - in thousands (for 1816-2001: population in cities $\geq 100k$; for 2002-2012: population in cities $\geq 300k$);

Figure no. 9. The evolution of Romania's urban population during the period 1919-2012



Source: authors' own processing

It is observed that the urban population registered a continuous growth between 1920-1990. In the period 1991-2000, the urban population registered slight decreases. Starting with the year 2000, the indicator only considers the population of cities with over 300,000 inhabitants, thus observing a constant maintenance of the urban population.

Table no.1 presents the descriptive statistics for each variable used in the empirical specification. The model presented in table no. 1 contains 94 observations, for the period 1919-2012. The table shows that the asymmetry coefficient (Skewness) reflects the negative asymmetry of the national capability index (FIVE), the total population (TPOP) and the urban population (UPOP), as well as the positive asymmetry of the other variables. The vaulting coefficient (Kurtosis) shows the platykurtic distribution of all variables, except for military expenses (MILEX) and military personnel (MILPER) which have a leptokurtic distribution.

Table no. 1 Descriptive statistics

	MILEX	MILPER	GDP	PEC	LEX_IND	IRST	CINC	TPOP	UPOP
Mean	1099981.	229.2340	97729.55	51448.73	2.436170	4324.713	0.006946	19449.66	3200.085
Median	561733.0	200.5000	74064.50	50306.00	1.000000	3165.500	0.007116	19625.50	2548.000
Maximum	5295000.	1179.000	239415.0	137222.0	6.000000	14437.00	0.011827	23207.00	8800.000
Minimum	13430.00	70.00000	9647.000	2477.000	0.000000	25.00000	0.002358	9722.000	868.0000
Std. Dev.	1303408.	183.7700	78819.21	42399.66	2.112729	4577.651	0.002135	2959.385	2266.146
Skewness	1.466176	3.570945	0.318198	0.473875	0.901029	0.893221	-0.338983	-0.642758	0.700818
Kurtosis	4.439378	16.07207	1.507442	2.001712	2.134181	2.611726	2.491944	2.823329	2.105611
Jarque-Bera	41.79280	869.0514	10.31152	7.421328	15.65515	13.09002	2.811225	6.594737	10.82768
Probability	0.000000	0.000000	0.005766	0.024461	0.000399	0.001437	0.245217	0.036980	0.004455
Sum	1.03E+08	21548.00	9186578.	4836181.	229.0000	406523.0	0.652900	1828268.	300808.0
Sum Sq. Dev.	1.58E+14	3140743.	5.78E+11	1.67E+11	415.1170	1.95E+09	0.000424	8.14E+08	4.78E+08
Observations	94	94	94	94	94	94	94	94	94

Source: authors' own processing

The hypothesis from which it was started is the one according to which the level of financial allocations to the defense budget is influenced by the options of political decisions but also by the socio-economic development of Romania.

The research aimed to identify the correlations between the above mentioned indicators, in three time periods, in which there were different regimes of political leadership, respectively monarchy (period 1919 - 1947), socialist system (period 1948 - 1989) and democracy (period 1990 - 2012), in order to highlight the economic, social and political influences on budget allocations to the army.

4. Findings

In the first stage of the study, the regression equation (1) was applied for the period 1919 - 2012, test results reflecting the existence of positive correlations between public spending on the military and the level of GDP, energy consumption, the democracy index and the national capability index. A negative correlation was also established between expenditure on the army and military personnel, population level and iron and steel production (Table 2). In terms of the correlation coefficient, the model is marginally significant, the results obtained suggesting an increase in spending on the army at the same time as the economic and social development of Romania.

Table no. 2. Empirical results

Dependent Variable: MILEX
Method: Least Squares
Date: 11/17/20 Time: 23:25
Sample: 1919 2012
Included observations: 94

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MILPER	-102.1259	523.3479	-0.195140	0.8457
GDP	11.24681	5.584063	2.014091	0.0472
PEC	29.00069	13.82342	2.097939	0.0389
LEXICAL_INDEX	37369.10	69089.08	0.540883	0.5900
IRST	-41.75419	111.6544	-0.373959	0.7094
CINC	71730390	53715776	1.335369	0.1853
TPOP	-45.40465	65.00694	-0.698459	0.4868
UPOP	-388.2940	71.86129	-5.403382	0.0000
C	249589.0	1137908.	0.219340	0.8269
R-squared	0.737125	Mean dependent var		1099981.
Adjusted R-squared	0.712384	S.D. dependent var		1303408.
S.E. of regression	699015.9	Akaike info criterion		29.84358
Sum squared resid	4.15E+13	Schwarz criterion		30.08709
Log likelihood	-1393.648	Hannan-Quinn criter.		29.94194
F-statistic	29.79345	Durbin-Watson stat		0.628541
Prob(F-statistic)	0.000000			

Source: authors' own processing

Next, the study aimed to highlight the socio-political and economic influences on budget allocations to the army in Romania, during the three great political regimes, respectively the period of monarchy (1919 - 1947), period of the socialist system (1948 - 1989) and the recent period of democracy (1990 - 2012). The results obtained following the application of the regression equation (1) for the three periods are summarized in table no. 3.

Table no. 3. Empirical results

Dependent Variable: MILEX
Method: Least Squares
Date: 11/18/20 Time: 14:40
Sample: 1919 1947
Included observations: 29

Variable	Sample: 1919 1947		Sample: 1948 1989		Sample: 1990 2012	
	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
MILPER	1.067724	0.9759	-24820.80	0.0000	-23373.23	0.0443
GDP	1.707879	0.4580	29.96887	0.0439	16.19704	0.0854
PEC	0.451148	0.8656	-46.52185	0.0585	-34.03907	0.3868
LEXICAL_INDEX	-1964.662	0.6004	926587.7	0.1062	-68796.47	0.8491
IRST	47.45823	0.7878	-263.8973	0.2068	-108.1526	0.6499

CINC	2018724.	0.5107	2.40E+09	0.0000	1.53E+09	0.2738
TPOP	-3.982826	0.3220	-133.9919	0.6399	-1680.098	0.5263
UPOP	252.8742	0.0113	43.16845	0.9044	-189.5970	0.1997
C	-178064.2	0.1020	-8039254.	0.0842	37494222	0.5242
R-squared		0.837246		0.936318		0.835816
Adjusted R-squared		0.772145		0.920880		0.741996
S.E. of regression		15416.21		438980.2		385612.0
Sum squared resid		4.75E+09		6.36E+12		2.08E+12
Log likelihood		-315.4136		-600.2038		-322.7661
F-statistic		12.86063		60.65004		8.908748
Prob(F-statistic)		0.000002		0.000000		0.000243

Source: authors' own processing

The results obtained highlight the differences between the three time periods, in terms of the correlations established between the level of spending on the army and the other variables considered. It should be noted that regardless of the time period, budget expenditures with the army in the case of Romania are positively correlated with the level of GDP and the national capability index but are negatively correlated with the total population.

It is also found that the democracy index has a positive correlation with the financing of the army during the socialist leadership, as well as during the monarchy and in the first part of the consolidation of democracy in Romania. The obtained results suggest an increased desire to consolidate the military power in the socialist period, and much more tempered with the increase of the level of democratization of Romania.

The results obtained from the empirical study confirmed the hypothesis according to which the level of financial allocations to the defense budget is influenced by the options of political decisions but also by the socio-economic development of Romania.

5. Conclusions

The study highlighted the correlations between the level of military spending on the one hand and the level of GDP, energy consumption, democracy index, national capability index, military personnel, population and iron and steel production, in order to ascertain the extent to which military power Romania, was influenced by economic, political and social factors.

The results showed that, among the selected indicators, the highest positive impact on the level of military spending had GDP, energy consumption, the democracy index and the national capability index. The study found a negative correlation between public spending on the army and military personnel, population level and iron and steel production.

Regarding the influence of political regimes, analysed through the democracy index, it was found a positive correlation with military spending, during the monarchy, the socialist political regime but also in the first part of the period of democracy consolidation in Romania (1990-2000).

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