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The impact of Public spending on European households economic (in)security

Ionuț-Andrei Pricop

ap.pricop@gmail.com

Alexandru Ioan Cuza University

Research Article

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Abstract

This article aims to investigate the effect of government spending on the economic security of European Union citizens. To undertake such an analysis, we used an aggregate index of economic insecurity among European citizens developed in a previous article and the various budget allocations of European states (quantified by the percentage of GDP allocated to a particular area). The analysis demonstrated how investments in sectors such as defence, agriculture, health, and energy play a crucial role, but also how budget allocations for education produce long-term effects rather than tangible positive effects in the near future.

JEL Classification: H11, H31, H50, I31, I32

1. Introduction

The field of economic security has become a rapidly growing field in recent years, with many factors that can increase or decrease it. Among the main determinants of economic security, we can highlight: education (Rysova & Kazansky, 2021), institutional quality (Rodrik, 2001), economic freedom (De Soto, 2000) or unemployment and inflation (Diaconu (Maxim) & Pricop, 2025). However, on the other hand, we cannot deny the existence of the state, considering that Hobbesian premises (1914) for the existence of an entity to oversee relations between citizens are legitimate. With this in mind, what we are interested in investigating in this article is the relationship between government spending and economic security.

A very "hot" topic for the European Union is that of defence (Cepparulo & Pasimeni, 2024). Although it can be argued that increases in military spending may stimulate aggregate demand and contribute to reductions in unemployment (Keynes, 1936) (Dunne, 2013) (Chary & Singh, 2024), there is also a tendency to consider that an increase in military spending could lead to greater inequality (Töngür & Elveren, 2012) (Dorn, 2024). We can also talk about an asymmetry between health and defence spending (Han & Jeong, 2025). Therefore, defence investments are characterized by a perceptual asymmetry: they can either increase citizens' economic security through related opportunities or decrease security because they divert public resources from alternative sectors with potentially higher social returns. In this sense, we can formulate the first research hypothesis:

H1: *Defence investments generate directly tangible effects for citizens*

We can also consider that investments in education can bring major benefits to society, having the capacity to create prosperity for future generations (Psacharopoulos, 1995) (Siedschlag & Durán, 2025). The problem lies in the fact that education is undoubtedly a long-term investment (Cohen & Soto, 2007) (Cook, 2004) (Marconi, 2018), if we consider that a complete cycle of studies lasts on average 17 years (Psacharopoulos, 1995). In this sense, the second hypothesis is formulated:

H2: *Investments in education, although positive for citizens, have long-term effects*.

In the short term, education may be regarded as a form of public expenditure targeted at a specific social category (students and teachers), with the potential to reduce the share of resources available to other population groups. Analogously, public investments directed toward pensioners may yield similar distributive consequences. In this context, budgetary reallocations assume a pivotal role in determining the allocation and redistribution of public resources (Lian, et al., 2024) (Isiaka, et al., 2025). From the above, we can also outline a third hypothesis:

H3: *There is an asymmetry between spending on different social categories*.

In the chapter devoted to methodology, we will present the statistical approach, followed by the main results.

2. Methodology

Table 1 presents the principal variables employed in this study. All expenditure variables are expressed as percentages of GDP; in the case of education, the measure corresponds to the aggregate expenditure across the primary, secondary, and tertiary levels. The dataset covers 26 of the 27 European Union member states for the period 2008–2023, with Croatia excluded due to data unavailability. The selection of independent variables was affected by data availability for all the 26 countries. Nevertheless, education and old-age-related expenditures are retained in the analysis due to their substantive importance. The dependent variable, economic insecurity, was aggregated in a previous study. We adopt the concept of economic insecurity, rather than economic security, as the former is more readily amenable to empirical measurement.

Table 1
Explanatory statistics

Variable	Abbreviation	Unit of measure	Source
Economic insecurity	EI	Aggregate index	(Diaconu, et al., 2026)
Total general government expenditure: Defence	Defence	GDP Percentage	(Eurostat, 2025)
Total general government expenditure: Agriculture, forestry, fishing and hunting	Agriculture	GDP Percentage	(Eurostat, 2025)
Total general government expenditure: Fuel and energy	Fuel & Energy	GDP Percentage	(Eurostat, 2025)
Total general government expenditure: Health	Health	GDP Percentage	(Eurostat, 2025)
Total general government expenditure: Education (Pre-primary and primary education + Secondary + Tertiary)	Education	GDP Percentage (sum)	(Eurostat, 2025)
Total general government expenditure: Family and children	Family & children	GDP Percentage	(Eurostat, 2025)
Total general government expenditure: Unemployment	Unemployment	GDP Percentage	(Eurostat, 2025)
Total general government expenditure: Social protection	Social protection	GDP Percentage	(Eurostat, 2025)
Total general government expenditure: Housing and community amenities	Housing amenities	GDP Percentage	(Eurostat, 2025)
Total general government expenditure: Old age	Old age	GDP Percentage	(Eurostat, 2025)
Total general government expenditure: Transport	Transport	GDP Percentage	(Eurostat, 2025)
Source: own elaboration			

The economic insecurity index was presented by Diaconu et al. (2026). The formula being:

Economic insecurity = (0.8306×0.3031×afme) +(0.9279×0.3031×car) +(0.8087×0.3031×comp) +(0.8356×0.3031×overcrow) + (0.6043×0.3031×infufe) + (0.6694×0.2574×afhol) + (0.7914×0.2574×arrears) +(0.7645×0.2574×fburd) +(0.8703×0.2574×imem) + (0.6746×0.2574×warmhome) +(0.8782×0.1616×wjh) +(0.9301×0.1616×mjh) [23]

In Table 2 we can, therefore, observe the descriptive statistics of the variables used.

Table 2
Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
EI	416	38.63863	18.86072	13.4	98.11
Defence	416	1.23774	.547849	.2	3.4
Agriculture	416	.4526442	.2696588	.1	1.8
Health	416	6.336538	1.520197	2.5	10.1
Fuel_energy	416	.49375	.5174165	− .5	4.3
Education	416	4.406971	.9998913	2.3	7.4
Family_children	416	1.960337	.9034279	.7	5.5
Unemployment	416	1.064663	.7769737	0	3.7
Social_protection	416	16.94615	4.046273	7.3	27.2
Housing_ammenities	416	.7074519	.478972	0	4.3
Old_age	416	9.197356	2.619863	3	16.2
Transport	416	2.642308	.908773	.6	5.2
Source: own elaboration					

On the other hand, Table 3 shows the correlation matrix.

Table 3
Correlation matrix

Variable	EI	Agric	Def	Fuel	Heal	Ed	Fam	Unm	SocP	Hou	Old	Tr
EI	1.0											
Agriculture	0.522	1.0										
Defence	0.214	0.074	1.0									
Fuel	0.058	−0.001	0.145	1.0								
Health	−0.608	−0.467	−0.114	−0.067	1.0							
Education	−0.417	−0.081	0.155	−0.220	0.364	1.0						
Family	−0.428	−0.118	−0.016	−0.180	0.322	0.515	1.0					
Unempl.	−0.414	−0.311	−0.115	−0.286	0.563	0.396	0.368	1.0				
Social Prot.	−0.398	−0.378	0.116	−0.214	0.665	0.463	0.458	0.677	1.0			
Housing A.	0.369	0.315	0.147	0.071	−0.367	−0.139	−0.109	−0.206	−0.213	1.0		
Old Age	−0.021	−0.191	0.256	−0.100	0.344	0.104	0.018	0.206	0.735	−0.054	1.0	
Transport	0.187	0.121	0.003	0.154	−0.025	−0.007	0.047	−0.297	−0.114	0.017	0.022	1.0
Source: own elaboration												

Table 4 shows the VIF test. The results of this test prompt us to remove the variable *Total general government expenditure: Social protection* from the analysis. Even though this may be considered an important variable, it does not meet the VIF test condition of values < 10 (Büyükuysal & Öz, 2016).

Table 4
VIF test

Variable	VIF	1/VIF
Social_protection	13.54	0.073872
Old_age	6.11	0.163765
Unemployment	3.47	0.288372
Health	2.45	0.408313
Family_children	2.18	0.459588
Education	1.79	0.559706
Agriculture	1.42	0.706540
Defence	1.29	0.776569
Housing_ammenities	1.22	0.819417
Fuel_energy	1.21	0.823464
Transport	1.21	0.828762
Mean VIF	3.26	
Source: own elaboration		
Considering that we will proceed with the statistical analysis excluding social protection, the equation we wish to present in this article will be:		

Elit = α + β1DEFENCEit +β2AGRICULTUREit +β3HEALTHit + β4EDUCATIONit +β5TRANSPORTit + β6FAMILY_CHILDRENit +β7OLD_AGEit + β8HOUSING_AMENITIESit + β9UNEMPLOYMENTit + β10FUEL_ENERGYit + u (1)

Where *EI* stands for Economic Insecurity, $\beta_x variable$ is the regressor, α is the constant, and u is the error term. As stated earlier, education is a long-term investment, which is why we can use a lag for it (however, considering the sample size, we will only use a lag of 2). We also use a lag of 2 for Defence and Unemployment, as their effects may have time lags. In the results section we will, therefore, proceed with the three above-mentioned models.

3. Results

Before proceeding with regression models, we will use the Pesaran CD-test(Pesaran, 2004) to check cross-section dependence and the Wooldridge test(Wooldridge, 2002) to check serial correlation. As we can observe in Table 5, Pesaran's test strongly rejects the null of cross-sectional independence. The Wooldridge test rejects the null of no first-order autocorrelation, suggesting serial dependence in the panel. Accordingly, fixed-effects models with Driscoll–Kraay(1998) standard errors are employed.

Table 5
Pesaran CD-test and Wooldrige test

Test	Probability	Statistic
Pesaran CD-test	Prob. = 0.000	CD-test = 11.786
Wooldrige test for autocorrelation	Prob. = 0.000	F = 133.331
Source: own elaboration		

In Table number 6 the fixed effects models with Driscoll-Kraay errors are presented. In model 1, we can observe negative correlations for Defense, Fuel & Energy, Health, Family & Children, Housing amenities, and Transport (the latter two without statistical significance, however). The results urge us to consider that a decrease in the percentage of GDP allocated to such sectors may cause an increase in the economic insecurity of European Union citizens, in the short term. On the other hand, we can observe positive correlations for

Agriculture, Education, Unemployment, and Old Age, with an increase in GDP allocated to these sectors leading to increased economic insecurity.

Table 6
Fixed Effects Models

Independent Variable	FE D-Ke Model 1	FE D-Ke Model 2	FE D-Ke Model 3
Defence	-8.201 (1.537) ***	-	-9.102 (1.852) ***
Defence L2	-	-5.825 (1.273) ***	-
Agriculture	13.776 (3.649) ***	20.771 (1.977) ***	16.346 (3.745) ***
Fuel_energy	-5.289 (1.520) ***	-6.199 (1.644) ***	-4.962 (1.256) ***
Health	-4.752 (0.517) ***	-4.318 (0.625) ***	-3.506 (0.737) ***
Education	5.579 (1.385) ***	-	-
Education L2	-	7.708 (1.167) ***	-
Family_Children	-3.355 (0.614) ***	-1.483 (1.554)	-1.789 (0.593) ***
Unemployment	3.920 (0.935) ***	-	6.595 (1.084) ***
Unemployment L2	-	3.289 (1.042) ***	-
Housing amenities	-0.395 (1.436)	-1.102 (1.743)	-0.347 (1.514)
Old age	2.080 (0.504) ***	2.669 (0.632) ***	-
Transport	-0.889 (0.897)	0.012 (1.107)	-0.527 (1.082)
Const.	36.588 (7.247) ***	7.981 (7.921)	65.302 (6.361) ***
R-squared	0.5648	0.5921	0.4936
Observations	416	416	416
Prob.	0.000	0.000	0.000
Source: own elaboration			

In model number 2, we used lags for Defence, Education, and Unemployment, but the results remain roughly unchanged. We can say that for Defence and Unemployment, the effects are moderately diluted, while for Education, they become more visible, demonstrating rather how, in the short term, education can increase Europeans' insecurity simply because it requires the allocation of funds that could go to other sectors that are more comprehensive for citizens (health or energy). This reiterates that education is a long-term investment, not a short-term one (Marconi, 2018). In this sense, Education and Old age are excluded from model 3, which confirms the previous results.

4. Disussions

The results of this study are consistent with the literature, confirming the initial hypotheses. First, we observe how defence spending, now more popular than ever, plays a crucial role in the economic security of European citizens (as evidenced by the significant correlation of -8.201). This result confirms the Keynesian perspective (1936) that defense spending can create new opportunities for a significant segment of society, thereby reducing economic insecurity.

Hypotheses 2 and 3 are also confirmed by the fact that our models have demonstrated that education is a long-term investment. In the short term, the models show us that investments in education reduce economic security because only a segment of society (students and teachers) benefits from such investments, while the real societal benefits of such investments are only visible in the long term (Yang, 2025). The use of a two-year lag only reiterated this idea (at a distance of two years, the effects are not yet visible). If we add to this the positive correlation with old age, we can confirm hypothesis 3, namely that there is a social asymmetry that can be caused by public investment (Lian, et al., 2024) (Isiaka, et al., 2025).

Having confirmed the first three hypotheses, we subsequently focus on the third model reported in Table 6, in which expenditures on education and old age are excluded. This specification indicates that the majority of estimated relationships are consistent with the existing literature. In particular, public spending on health (Vărzaru, 2025), family-related investments (Donkin, et al., 2014), and energy (Hosan, et al., 2023) emerges as having a significant and positive effect on the economic security of European citizens. Expenditures on housing amenities and transport exhibit effects in the same direction; however, their coefficients do not reach conventional levels of statistical significance.

Other interesting correlations are those concerning agriculture and unemployment, both of which have a positive correlation with economic insecurity. This leads us to conclude that higher spending on agriculture is actually synonymous with an Common Agricultural Policy (CAP) that does not function to its full potential, but may even generate negative effects, as mentioned in various studies (Gorton, et al., 2009) (Pe'er, et al., 2020). Moreover, the current agreement that the European Union wants to stipulate with Mercosur (Ghiotto & Echaide, 2019) confirms this. The correlation between agriculture and economic insecurity could be reviewed a few years after the EU-Mercosur treaty enters into force, in order to determine the variation in effects.

With regard to unemployment, we used model number 2 to check whether its effects spread over time. The results showed us that an increase in unemployment benefits actually reduces economic security, indicating either a recession in national economies (Okun, 1962) or a relationship of dependence on unemployment benefits (Murray, 1984).

5. Concluding remarks

To analyze the relationship between government spending and economic insecurity across EU countries, we employ a fixed-effects panel regression that controls for time-invariant country-specific factors. To account for heteroskedasticity, autocorrelation, and cross-sectional dependence in the panel, standard errors are computed using the Driscoll-Kraay method. This approach ensures robust inference even in the presence of correlated shocks across countries or over time. While endogeneity and reverse causality may still exist, this model provides a reliable estimation of the associations of interest.

The models presented show us somewhat expected results: increasing the percentage of GDP allocated to health, energy, and families can contribute to reducing the economic insecurity of European households. On the other hand, through this study, we were able to revisit the Keynesian model on defence spending and, moreover, justify the transition that the European Union wishes to make from the CAP paradigm to the agreement with Mercosur. Another important aspect highlighted in this study is the long-term effects of education.

The study could be improved in the future by expanding the sample size and observing the effects that may arise within the European Union as a result of paradigm shifts in agriculture and defence. However, we could consider that the study represents a true picture of the reality of the European Union and could be taken into account for various decision-making processes within it.

Declarations

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Data availability statement

"The data supporting the findings of this study are openly available from Eurostat at Eurostat, 2025. General government expenditure by function (COFOG) [gov_10a_exp__custom_19408722]."

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Author Contribution

I.-A. Pricop wrote the entire manuscript.

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Footnotes

1. AFME = Inability to afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day; CAR = Persons who cannot afford a personal car; COMP = Persons who cannot afford a computer; OVERCROW = Overcrowding rate; INFUFE = Inability to face unexpected financial expenses; AFHOL = Inability to afford paying for one-week annual holiday away from home; ARREARS = Arrears (mortgage or rent, utility bills or hire purchase); FBURD = Financial burden of the repayment of debts from hire purchases or loans; IMEM = Inability to make ends meet; WARMHOME = Inability to keep home adequately warm; WJH = Women aged 18–59 living in jobless households; MJH = Men aged 18–59 living in jobless households
2. Of the 416 observations used in determining the index, 14 were stipulated utilizing linear interpolation or the first observed value, as they were missing.