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THE ECONOMIC GROWTH CATALYZERS AT THE EUROPEAN LEVEL, IN THE CONTEXT OF THE 2008 FINANCIAL CRISIS

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Abstract

The research addresses the issue of identifying new catalysts for economic growth at European level, supporting the future mix of policies. It was analyzed, the nature of the intercorrelation between the economic indicators Gross Domestic Product (GDP and GDP per capita), conventionally assimilated to economic growth and relevant macroeconomic indicators, interacting in a complex manner (domestic credit, export of goods and services, Foreign Direct Investment – net inflows, saving).

In the first two parts of this paper we present the main challenges and macroeconomic evolutions at the European level, as well as, relevant aspects reflected in researches and representative studies for the issues addressed; the third part of the article includes the empirical study for 20 European countries over a period of 17 years, where, based on the use of the multiple regression model, we analyzed the correlations between the indicators for the Gross Domestic Product – endogenous variables and the main macroeconomic country indicators – exogenous variables (domestic credit, export of goods and services, Foreign Direct Investment – net inflows, savings). Part four highlights the results of the research alongside other issues relevant to future analysis.

The research reflects the evolution of economic growth, measured both by the change in GDP and by the change in GDP per capita that can be explained mainly for the data panel considered in the analysis, by means of two catalytic factors: the dynamics of the domestic credit, respectively that of the savings, variables with a lower degree of volatility.

Keywords: economic growth, export, savings, investment, domestic credit, GDP, European Union (EU).

JEL Classification: C23, O11, O47, O52

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Introduction

The evolution of economic growth represents an important issue, both for economists and economic researchers, as well as, for authorities, regulatory bodies, investors and the population. The evolution of economic growth is identified, in a broad sense, by using the GDP dynamics, conventionally being measured as the GDP growth rate. In accordance with OECD, GDP reflects “an aggregate measure of production equal to the sum of the gross value added of all resident and institutional units engaged in production (plus any taxes and minus any subsidies, on products not included in the value of their outputs”); another generally accepted and used definition: GDP (Gross Domestic Product) reflects the sum of the market value of all goods and services destined for final consumption produced in all branches of the economy within a country within one year.

The financial and economic post-crisis context at European level was reflected in particular by consistent efforts to build a new, sustainable, strategic vision of developing mechanisms to improve mobility / allocation of capital to the European real economy, dynamics and impact financial in banking regulations, technological developments, changes in consumer behavior regarding investment and consumption.

The economic and social challenges faced by both developed countries and countries that have made significant progresses can be addressed through the use of new knowledge and technologies that will generate benefits for consumers and society, but with the emergence of specific risks and uncertainties.

Economic growth reflected by GDP dynamics can be calculated at a country or region level, various methods can be used, which leads to the identification of a large number of suggestions about how the theoretical approaches should respond to the theories and economic realities.

Economic theory mainly accepts three approaches: a) based on production expenditures for obtaining products and services at the level of an economy: $GDP = \text{final consumption expenditures of population and companies} + \text{gross expenditures for investments in the national economy} + \text{expenses government procurement for goods and services} + \text{net export (exports} - \text{imports)}$; b) Based on income: $GDP = \text{salary incomes} + \text{interest income} + \text{incomes from allowances, respectively type of rent} + \text{profits of companies} + \text{depreciations in productive sector} + \text{indirect revenues of general government from taxes}$; c) based on the use of revenues: $GDP = \text{consumption expenditure of the population and economic agents} + \text{savings of the population and economic agents} + \text{taxes paid to the public administration (less interest, transfers and other forms of subsidy)} + \text{net money transfers, made to other states by the citizens of the country}$.

Due to the structural changes at the level of the global economy, national economies and at the level of financial markets, due to effects of the financial crisis that have started in 2008, as well as the causes that triggered it, the evolutions and sophistication of risks and significant development of regulatory environment, especially for the financial and banking industry, in academic and research environment have emerged concerns about studying the sustainability of current models based on GDP relevance, the need for economic growth for a specific country/economy, studying of emphasis and incorporation of new indicators that detect the behavioural evolutions of main contributors to GDP formation, completing and integrating macroeconomic models based on these indicators.

Our work adds value to existing research by addressing the issue of economic growth and the nature of inter-correlations, mainly with four indicators that are particularly relevant to a country's economy in the new post-crisis context (the domestic credit, exports of goods and services, Foreign Direct Investments, savings), which have profound implications and significant tangency, with the banking environment, with the behaviour of companies and individuals in terms of surplus available capital, with the development of commercial relations between economies, with investment strategies and drawing new trade partnerships, into a new global, post-financial crisis ecosystem that re-emerges on new pillars. These four indicators are relevant, also for the future mix of policies developed at the level of the authorities.

Our research focuses on the European area, including countries with different stages of economic development, including 10 developed economies (Western Europe) and 10 economies that have made significant progress (Central and Eastern Europe). The numerous studies and analyses carried out in the context of post-financial crisis have reflected the strategic interdependencies between the development of a country's economy, a region, and the contribution, stability, involvement of the banking sector in that country, region.

We have used a mix of quantitative analytical tools, to analyse the developments of these relevant indicators and the influences on GDP and GDP per capita for 20 countries over a period of 17 years.

The European economy is dependent on bank lending compared to the US economy, which is mainly funded through the capital market and alternative banking sector structures. Also, domestic credit affects most of the GDP components, regardless of the method used for GDP formation. In this context, the domestic credit of an economy (domestic credit = private sector credit + government credit) was selected to capture the nature of the relationship between lending and economic growth.

Another indicator selected for the empirical study is Foreign Direct Investment. The evolution of this indicator, as well as its impact on the economy of a country is a particular concern at the level of governmental authorities, but also in the academic and research environment. Within an increasingly sophisticated financial system to support the needs of an economy, Foreign Direct Investment may complement investment made based on the country's capital.

Savings is an indicator whose relevance has been highlighted and reconsidered in the post-crisis context, both at the level of research preoccupations and at the level of policy makers, being influenced by a set of factors including monetary policy, credit policy, fiscal policy, budget policy, education and culture, customer behaviour of banks and the level of development of savings and placement products and solutions, pensions, the saving affects economic growth.

Exports of goods and services represent the fourth indicator included in the econometric survey. In the next section, we will include comments on numerous studies on the complex relationship between exports, imports, foreign trade components of a country and economic growth. The structure of exports, the level of technology and innovation that a country incorporates in its exports, the dynamics of high value-added exports contribute to economic growth.

Given the orientation of the empirical study towards the European economy, we will continue to introduce relevant elements for the evolution of economic growth at European level and at the level of European countries (Member States) over the 17-years period covered by the study, as well as related elements of the four indicators considered for the empirical study. From the economic growth perspective reflected conventionally through GDP and GDP per capita, we will capture the main developments (see *Figure 1 – Real GDP evolution for the countries included in the empirical analysis*) at the level of the two groups of selected countries, respectively 10 countries with developed economies in Western Europe: Germany, United Kingdom, France, Italy, Spain, Denmark, Netherlands, Belgium, Greece, Luxembourg, as well as, 10 countries in Central and Eastern Europe, whose economies have made significant progress: Poland, the Czech Republic, Croatia, Romania, Hungary, the Slovak Republic, Slovenia, Bulgaria, Albania, Latvia. We mention that due to the selected timeframe, since 2006, Greece has been included in the first group of countries.

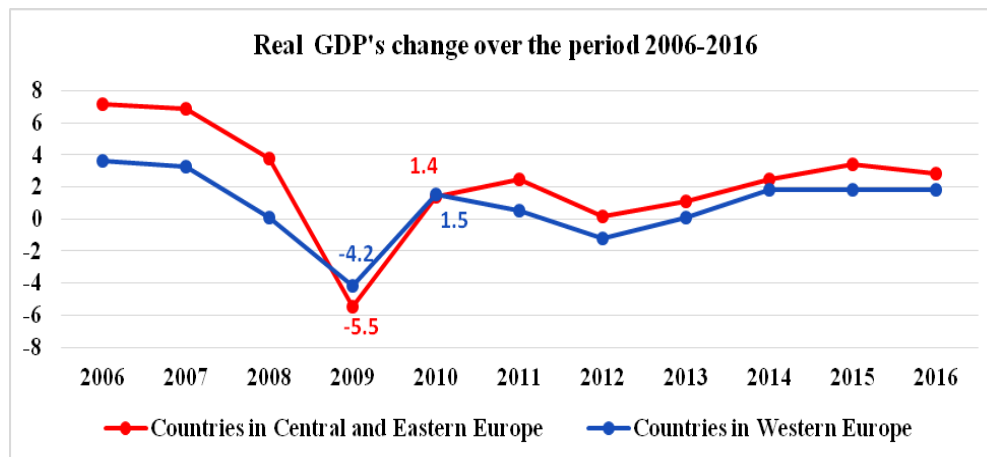


Figure no. 1. Real GDP evolution for the countries included in the empirical analysis

Source: authors' computations, Eurostat database

From the perspective of European economic and monetary integration, focused on the principle of economic convergence (nominal and real), emphasis is placed on nominal convergence, aimed at coordinating economic policies that have an impact on aggregate demand (monetary, fiscal, budgetary, income). Real convergence is aimed at approaching aggregate supply policies – structural reforms, impacting the economic potential. Central and Eastern Europe is considered to be an economically and financially integrated region with the Euro / European Union area, but significant differences are apparent by the GDP per capita indicator (according to Table no. 1 – *Per capita volume indices, period 2014-2016*).

Between EU Member States there is a significant dispersion in the GDP per capita index. In 2016, Luxembourg had the highest GDP per capita in the EU, more than two and a half times the EU-28 average, given also the predominantly financial nature of the Luxembourg economy, the population number and the specificity of financial transit. Bulgaria was the Member State with the lowest GDP per capita at 51% below the EU-28 average. It should be noted that GDP per capita indicators are also used to allocate Structural Funds at EU

level, regions where GDP per capita is less than 75% of the EU average (over a period of 3 years) being eligible for Structural Funds. Another indicator, considered by the relevant European reports, relevant to GDP per capita is Actual Individual Consumption (AIC). The levels recorded by the AIC index (detailed in *Table no. 1 – Per capita volume indices, period 2014-2016*) were somewhat more homogeneous, but show significant differences between the European countries. Luxembourg also recorded the highest level of the per capita AIC index within the EU-28, 32% above the EU average.

Table no. 1 – Per capita volume indices, period 2014-2016

	PIB per capita			AIC		
	2014	2015	2016	2014	2015	2016
Luxembourg	270	267	258	138	135	132
Netherlands	130	129	128	113	112	111
Denmark	128	127	124	115	115	113
Germany	126	124	123	124	122	122
Belgium	119	119	118	115	114	112
United Kingdom	109	108	107	115	115	116
France	107	105	104	112	111	111
Italy	96	95	97	97	97	98
Spain	90	91	92	87	89	89
Czech Republic	86	87	88	78	78	78
Slovenia	82	82	83	76	76	76
Slovak Republic	77	77	77	76	76	76
Greece	72	69	68	80	79	77
Poland	67	68	68	74	74	74
Hungary	68	68	67	62	63	63
Latvia	64	64	65	65	65	67
Croatia	59	59	60	59	59	59
Romania	55	56	58	56	58	61
Bulgaria	47	47	49	51	53	53
Albania	30	29	29	37	38	37

Note: The table shows the volume indices reported at the EU-28 average (EU-28 = 100; for example, in the case of Netherlands: GDP per capita in 2016 was +28% higher than the EU-28 average);

Source: Eurostat

In the empirical study provides some answers to the fundamental question representing in fact the focus of this research: which of the indicators analyzed at the level of the 20 European economies (internal credit, Foreign Direct Investment, export, saving), over a period of 17 years, have a positive determinant impact / influence in a relevant manner the evolution of GDP, GDP per capita? To answer this question, we will formulate four assumptions that we will test through the multiple regression model. In the section dedicated to results and discussions, we will also ask other questions, both to try to answer and to structure new objectives for future research.

1. Review of the scientific literature

In this section of the research, we analyzed relevant aspects of previous studies and research that included both economic growth, analysis of its components, analysis of the

four macroeconomic indicators included in the empirical study, and their correlations. Research studies, reflecting the fact that the best known and used indicator for expressing economic growth, defined as the positive variation in the production of goods and services in a economy on a determined period, is GDP (total or per capita).

Fioramonti (2013) presents the history of this indicator and how it evolved over time, starting from the fact that the economic power of a country is defined primarily by the evolution of GDP. In this sense, the first assessment of national wealth was made in 1600 by British economist William Petty, by analyzing the value of the lands conquered by Oliver Cromwell in Ireland. Subsequently, the definition of a nation's welfare (initially represented only by lands owned) was developed and improved in parallel with the progress of modern society and implicitly, of economic concepts. Thus, GDP (Gross Domestic Product) reflects the sum of the market value of all goods and services destined for final consumption produced in all branches of the economy within a country, during a one-year period, this definition being generally accepted and used.

Over time, economic realities have led to a continuous process of changing and adapting approaches concerning the growth and economic development. In classical theory, the main factors influencing the process of economic growth, taken into account, were:

- savings, which means reducing consumption and aggregate demand, causing the current GDP to decline; in the long run, it can be a source of financing for investment and, implicitly, for GDP growth;
- production factors, which record decreasing yields;
- capital accumulation, being the reason for pursuing profit-making (the essential source of investment financing).

According to Misztal (2011), the result of research on savings and economic growth, both in advanced economies and in emerging and developing economies, is generally consistent with theories of economic growth. From the point of view of the standard economic growth theory, a positive effect between internal savings and economic growth could occur in advanced economies where the high level of domestic savings could be a key source of domestic investment financing and an economic growth factor. In less developed countries, attracted resources are used mainly to finance investments, with their internal savings being reduced.

In terms of Foreign Direct Investment (FDI), authors such as Borensztein, De Gregorio and Lee (1998) consider that FDI has a positive growth effect when the recipient country has a high-educated workforce, this being able to exploit the spill over effects of FDI. Bengoasi Sanchez-Robles (2003) argue that FDI is positively correlated with economic growth, but they call into question the fact that host countries require human capital, economic stability and liberalized markets to be able to benefit in the long run from the effects of FDI flows. In 2000, Carkovic and Levine reach the same conclusion, but Balasubramanyam, Salisu and Sapsford (1996) notes that the liberalization degree of trade is crucial for achieving positive effects of FDI. The research carried out by Almfraji and Almsafir (2013) concluded that in the relationship between FDI and economic growth, FDI has positive effects on the economic growth of the host country; only in some cases there have been negative or no effects. Investigating how these effects have been achieved, it has been identified that adequate levels of human capital, developed financial markets and open trade regimes play

a positive role in the relationship between FDI and economic growth, while dependence on FDI and the technical gap contribute negative to the FDI – economic growth relationship.

Kim and Lin (2009) studied the impact of the export structure on economic growth, indicating that not all exports contribute equally to economic growth, in particular, many developed countries relying on primary products, which in turn are dependent on significant fluctuations of prices.

In the study by Dritsaki and Stiakakis (2014) on the dynamics of the causal relationship between FDI, exports and the economic growth of Croatia for the period 1994-2012, it is concluded that, FDI does not lead to economic growth in Croatia, both in the short and long term period; this is only partially consistent with the 2005 study by Vukšić, which indicates that FDI does not play an important role in supporting exports further in Croatia's economic growth, indicating that there are some constraints on export expansion due to either limitations of production, or lack of industry-leading technology, or both; in conclusion, it is highlighted that domestic capital investment and exports are catalysts for Croatia's economic growth.

In the research realised in 2017 by Dudzevičiūtė, Šimelytė and Antanavičienė it has been investigated the long-term relationship (1995-2015) between exports and economic growth in the countries of the EU. Correlation analyzes have shown that there are significant relationships between exports and economic growth in twenty-two countries.

Dabla-Noris, et al. (2015) considers that there is a need for a consistent reduction of social inequalities in order to achieve sustainable economic growth – increasing the income of the middle and middle classes by 1 pp. leads to a GDP growth of 0.38 pp, while the increase of the rich class revenues by 1 pp. leads to a GDP decline of 0.08 pp.

Economic literature has progressively developed, encompassing the issue of economic growth and the determinants that influence growth.

2. Methodology and data

Our empirical analysis was realised by using the multiple regression model to highlight the intercorrelation between the GDP indicators – endogenous variables (GDPGR and GDPCAP) and the main macroeconomic indicators of a country – exogenous variables (domestic credit / DOMCRE, export of goods and services / EXPORT, Foreign Direct Investment – net inflows / FDI, saving / SAV). The variables included in the econometric study are expressed in percentages to highlight their dynamics over time.

The abbreviations used in the empirical study are:

- GDPGR – for the Gross Domestic Product,
- GDPCAP – for the Gross Domestic Product per capita,
- DOMCRE – for the domestic credit,
- EXPORT – for the export of goods and services,
- FDI – for the Foreign Direct Investments,
- SAV – for saving.

Thus, to analyze the intercorrelation level between the indicators defined above, the following working hypotheses were formulated, applicable for both dependent variables (GDPGR and GDPCAP):

- I₁: domestic credit positively influences economic growth as measured by GDP variation;
- I₂: Foreign Direct Investment is a major driver of economic growth as it exerts the greatest influence on GDP growth;
- I₃: economic growth is directly proportional to the evolution of exports, in the sense that it highlights the capacity of an economy to generate added value by capitalising on national output externally;
- I₄: economic growth is in direct relation to savings.

The methodology used to verify these hypotheses includes the collection of 380 observations and is based on econometric modelling using Stata 11 and Eviews 8.0. The data series included in the regression model have an annual frequency, the analysis being based on a data panel from 1999 to 2016, extracted from the World Bank database, for 20 countries in Europe (10 Western European countries: Germany, United Kingdom, France, Italy, Spain, Denmark, Netherland, Belgium, Greece, Luxembourg and 10 Central and Eastern European countries: Poland, Czech Republic, Croatia, Romania, Hungary, Slovak Republic, Slovenia, Bulgaria, Albania, Latvia). The reason for choosing the timeframe analyzed (1999-2016) was the starting point of the year when the common European currency was introduced. Also, the selected timeframe is relevant both for the period before the economic and financial crisis and for the post-crisis period. Concerning the selected countries, they included the founding countries of the European Union (Germany, United Kingdom, France, Italy, Spain, Denmark, Netherlands, Belgium, Greece, Luxembourg) and Central and Eastern European countries (Poland, the Czech Republic, Croatia, Romania, Hungary, the Slovak Republic, Slovenia, Bulgaria, Albania, Latvia), representative from the point of view of structural changes in the economy (affected by transition processes from centralized economy to market economy, or even situated in an early stage of reforms – Albania, a candidate country for EU membership); also, the delimitation of the selection perimeter took into account the level of exports recorded by these countries in relation to the realized GDP.

The characteristics of the aforementioned variables were further evaluated in order to select the optimal analysis methodology. The estimation of simple and multiple regression models implies the existence of essential characteristics of the data series, so that the results obtained are statistically and economically relevant. In this sense, all variables were logarithm, which will allow the interpretation of the results obtained through the growth rates. From the point of view of the distribution of the data series used in the econometric analysis, it is possible to observe abnormalities of the distribution (Table no. 2), in the sense that:

- the probability associated with the Jarque-Bera test for both dependent variables (GDPGR and GDPCAP) and independent variables (DOMCRE, FDI, SAV) is 0%, less than the significance threshold of 5%, so the null hypothesis that the series are normally distributed cannot be accepted;
- there is an excess of kurtotic (kurtosis / coefficient of flattening > 3), which describes a leptokurtotic distribution, with a higher probability of occurrence of extreme variations for the used variables;

- the negative asymmetry coefficient (skewness < 0) for the endogenous variables (GDPGR and GDPCAP) and the exogenous SAV variable indicate an asymmetric distribution to the left, with extreme values significantly lower than the average of each data series;
- the positive asymmetry coefficient (skewness > 0) for the DOMCRE and FDI series is associated with an asymmetric distribution to the right, the extreme values being significantly higher than the average.

Table no. 2. The distribution of data series

	GDPGR	GDPCAP	DOMCRE	EXPORT	FDI	SAV
Skewness (asymmetry coef.)	-0,713286	-0,307365	18,89005	1,238498	18,45549	-0,019846
Kurtosis (flattening coef.)	5,887884	4,913247	357,8905	15,44598	346,9259	8,119927
Jarque-Bera test	155,6247	60,57612	1910619,	2415,570	1794712,	393,2284
Probability	0,000000	0,000000	0,000000	0,000000	0,000000	0,000000
Observations	360	360	360	360	360	360

Source: authors' computations, Eviews use

It should be mentioned that the absence of a normal distribution can be explained by the small size of the data sample in the perspective of the analyzed timeframe (1999-2016), as well as, by the existence of extreme values given that the panel included, both countries with developed economies, as well as, countries whose economies have made important progress. No dummy variables were introduced in the model to eliminate the abnormal values (extreme increases / decreases of the indicators compared to other data), as the number of countries is reduced and thus, by reducing the sample of observations there may be distorted results and losses from the information content of the data.

Another essential property of the data series is stationarity, which implies that the statistical rules after which the series of data evolves do not change fundamentally (average and variance are constant), so that a potential shock on the series can be absorbed in time without having a permanent character and a negative impact on the econometric outcomes.

The probabilities associated with the applied stationarity tests (0% for both Augmented Dickey-Fuller and Phillips-Perron, see Table no. 3) are lower than the 5% relevance threshold, so the null hypothesis, according to which the series has a root unit and is non-stationary is rejected, all the data series included in the analysis being stationary. If the null hypothesis was accepted, any model used would have been useful only accidentally, without any particular relevance to the analysis performed.

Table no. 3. Tests of stationarity

	Method	Prob.
GDPGR	Null: Unit root (assumescommon unit rootprocess)	
	ADF* – Fisher Chi-square	0.0000
	PP* – Fisher Chi-square	0.0000
GDPCAP	Method	Prob.
	Null: Unit root (assumescommon unit rootprocess)	
	ADF – Fisher Chi-square	0.0000
	PP – Fisher Chi-square	0.0000
	Method	Prob.

	<i>Method</i>	<i>Prob.</i>
DOMCRE	Null: Unit root (assumescommon unit rootprocess)	
	ADF – Fisher Chi-square	0.0070
	PP – Fisher Chi-square	0.0000
	<i>Method</i>	<i>Prob.</i>
EXPORT	Null: Unit root (assumescommon unit rootprocess)	
	ADF – Fisher Chi-square	0.0000
	PP – Fisher Chi-square	0.0000
	<i>Method</i>	<i>Prob.</i>
	Null: Unit root (assumescommon unit rootprocess)	
FDI	ADF – Fisher Chi-square	0.0000
	PP – Fisher Chi-square	0.0000
	<i>Method</i>	<i>Prob.</i>
	Null: Unit root (assumescommon unit rootprocess)	
SAV	ADF – Fisher Chi-square	0.0000
	PP – Fisher Chi-square	0.0000

**ADF: Augmented Dickey-Fuller and PP: Phillips-Perron
Source: authors' computations using Eviews 8*

Having in view the specificities of the data panel used, including the fact that all variables are auto correlated, meaning that they are affected by their previous values, the models estimation was done on a dynamic panel – the difference and system GMM methodology (the `xtabond2` command in Stata 11) presented by Roodman (2006). The results obtained when estimating the correlation coefficients between exogenous variables revealed that they are strongly correlated. Therefore, the correlation with the lowest intensity (73,3%, see Table no. 4) refers to the evolution of domestic credit (DOMCRE) in relation to the dynamics of Foreign Direct Investment (FDI). At the same time, the correlation with the most pronounced intensity (96.8%) is established between the domestic credit (DOMCRE) variation and the evolution of saving (SAV).

Table no. 4. Matrix of correlations between independent variables

Coefficient of correlation	DOMCRE	EXPORT	FDI	SAV
DOMCRE	1.0000	-	-	-
EXPORT	0.9468	1.0000	-	-
FDI	0.7332	0.7995	1.0000	-
SAV	0.9689	0.9579	0.7534	1.0000

Source: authors' computations using Eviews 8

Consequently, the estimation of multiple regression models can be affected by the multicollinearity phenomenon, which is why, further on, simple regression models have been constructed using the two variants of the economic growth and the factors considered.

The analyses were run on simulations with different specifications (different lags and instruments). Of these, the most efficient one was the variant with the first lag of the dependent variable and the first lag of the analyzed factor as explanatory variables in the model, with 19 instruments. Larger order lags were found to be insignificant in this study (the associated probability > 10%).

Thus, the final form of the estimated models (models 1 to 8) was:

$$Y_i = const. + \beta_1 \times L.Y_i + \beta_2 \times X_i + \beta_3 \times L.X_i + \varepsilon_i \tag{1}$$

Where:

Y_i – dependent variable: GDPGR or GDPCAP,

$L.Y_i$ – the lag of order 1 of the dependent variable,

X_i – independent variables: DOMCRE, EXPORT, FDI, SAV,

$L.X_i$ – the lag of order 1 of the independent variables.

In the multivariate analysis, both the level and the first rank lags of the variables were introduced into the model. The optimal model was obtained using the main component regression analysis option. Thus, 8 components with 11 instruments were obtained.

The models can be defined in the following general form (models 9 and 10):

$$Y_i = \text{const.} + \beta_1 \times L.Y_i + \beta_{j2} \times X_{ji} + \beta_{j3} \times L.X_{ji} + \varepsilon_t \quad (2)$$

Where:

Y_i – dependent variable: GDPGR or GDPCAP,

$L.Y_i$ – the lag of order 1 of the dependent variable,

X_{ji} – independent variables: DOMCRE, EXPORT, FDI, SAV,

$L.X_{ji}$ – the lag of order 1 of the independent variables,

j – takes values from 1 to 4, identifying the coefficients of the four exogenous variables considered.

All models were estimated in robust version and post-estimation validated.

3. Results and discussions

The results of the calculations (see Table no. 5) revealed that each of the four independent variables significantly influences GDP growth rates, both in general and in the per capita variant. Moreover, the influence is not only significant for the level of the variables, but also for their first order lag. The coefficient of the level is positive, while the lag coefficient is negative. In conclusion, the growth rate of GDP is directly influenced by each of the evaluated factors.

Table no. 5. Regression univariate models

Independent Variable	Dependent variable: GDPGR				Dependent variable: GDPCAP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>L. dependent</i>	0.882*** (0.042)	0.959*** (0.03)	0.889*** (0.02)	0.592*** (0.112)	0.989*** (0.335)	0.933*** (0.022)	0.883*** (0.016)	1.019*** (0.028)
DOMCRE	0.837*** (0.043)	-	-	-	0.766*** (0.042)	-	-	-
L.DOMCRE	-0.746*** (0.033)				-0.766*** (0.046)			
EXPORT		0.803*** (0.042)	-	-	-	0.746*** (0.024)	-	-
L.EXPORT	-	-0.762***	-	-	-	-0.719***	-	-

Independent Variable	Dependent variable: GDPGR				Dependent variable: GDPCAP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		(0.023)				(0.025)		
FDI	-	-	0.077*** (0.019)	-	-	-	0.04*** (0.01)	-
L.FDI	-	-	-0.032** (0.015)		-	-	-0.025** (0.012)	-
SAV	-	-	-	0.773*** (0.098)		-	-	0.839*** (0.102)
L.SAV	-	-	-	-0.373*** (0.322)	-		-	-0.851*** (0.108)
Constant	0.69*** (0.265)	0.028 (0.078)	1.895*** (0.403)	0.833** (0.322)	0.113* (0.064)	-0.022 (0.079)	0.825*** (0.162)	0.127 (0.068)
Hansen test (prob.)	0.188	0.175	0.183	0.238	0.235	0.176	0.179	0.239
Arellano-Bond AR(2) (prob.)	0.672	0.114	0.023	0.464	0.831	0.144	0.000	0.584
Wald Chi ²	6650.28	144644.01	3747.8	9790.8	41807.93	30654.27	4824.3	29838.05

*Significance threshold: *** – 1%, ** – 5%, * – 10%.*

Coefficient (standard error in the robust variant).

Source: authors' computations using Stata 11.

Thus, it can be noticed that GDP growth rate increases by 0.84% in the same year, with an increase in domestic credit by 1%. For GDP per capita, the increase is 0.77% for the same change in domestic credit.

Practically, it can be argued that the increase in domestic lending will also stimulate the economic growth of a country. Similar conclusions may also be reflected in the case of the influence of export and savings dynamics on GDP, respectively on GDP per capita. Therefore, 1% annual growth of exports will result in GDP growth of 0.8% and of 0.75% in the case of GDP per capita. Instead, it can be noticed that upward trend of saving will mainly support GDP per capita growth (0.84%) in the context of a GDP growth of only 0.77%.

For the models estimated with the independent FDI variable, specification problems were identified in both analyzed forms (GDPGR and GDPCAP). Thus, although all the other robustness tests and post-estimation validation support the model as being significant, the Arellano-Bond test for autocorrelation problems for serial correlation of differences is maintained. The simulations show that it becomes insignificant (probability associated > 5%) starting with testing of the 3rd order series correlation in differences for GDPGR (AR (3) Prob = 0,063) and the 5th order for GDPCAP (AR (5) Prob = 0,696). But correcting the serial correlation by estimating the model with larger lags determines a larger number of instruments than the optimal model relating to the number of observations. On the other hand, having in view that the data are annual, a lag of 5, for example, would mean historical influences of 5 years, which may lead to a much longer timeframe for predictions in a dynamic economy, similar to those included in the analyzed sample. Further on, to assess the long-term stability of the relationships identified by the initially estimated models, it is necessary to analyze the long-term coefficients, their significance being verified by the Wald test (see Table no. 6).

The test results confirmed that the GDP growth rate is significantly influenced, in the long term, by the four independent variables analyzed. In all cases, long-term coefficients are positive. For example, an increase in exports of 1% results in a 0.99% increase in long-term GDP. Similarly, domestic credit growth of 1% generates GDP growth of 0.77%, and so on. When the proxy for the dependent variable was GDP per capita, the significance of domestic credit and saving disappears over the long term (probability associated > 10%). Thus, the GDP per capita growth rate is influenced, in the long term, by exports and Foreign Direct Investment, as long as the limitation identified for this variable (the presence of serial autocorrelation) is maintained. An increase in exports of 1% leads in the long time to a 0.40% increase in GDP per capita.

Table no. 6. Long-term coefficients

Model	Variable	Coefficient	Wald Chi ²	Probability
(1)	DOMCRE	0.771	685.9	0.000
(2)	EXPORT	0.994	228.11	0.000
(3)	FDI	0.409	24.64	0.000
(4)	SAV	0.981	1623.94	0.000
(5)	DOMCRE	-0.078	0.01	0.936
(6)	EXPORT	0.397	79.31	0.000
(7)	FDI	0.136	5.73	0.017
(8)	SAV	0.657	2.03	0.154

Source: authors' computations using Stata 11

Taking into account the results of the econometric estimations and the working hypotheses initially formulated for the analysis of the determinants of the economic growth, it may be concluded that:

- The hypothesis I_1 is accepted for both variables used as proxy for economic growth, for short-term coefficients per level. This working hypothesis is also valid for long-term coefficients, but only for GDP. In the case of GDP per capita, the latter become insignificant;
- The hypothesis I_2 is denied. Foreign Direct Investment has the least influence both in the short and long term;
- The hypothesis I_3 is confirmed by the results of the analyses. In the short term, exports are the second most influential, while long-term has the greatest influence on economic growth, irrespective of the proxy used;
- The fourth working hypothesis is confirmed in the short term, on variable level. In the long term, however, GDP is positively influenced by savings, while GDP per capita is not.

Following the multivariate analysis (Table no. 7), the GDPGR is significantly influenced by savings, while GDPCAP by domestic lending. But none of these coefficients is significant in the long term.

Table no. 7. Multivariate analyses

	Dependent variable: GDPGR	Dependent variable: GDPCAP
Indep. Variables	(9)	(10)
L.dependent	0.464 (1.124)	0.901*** (0.114)
DOMCRE	0.426 (0.481)	0.779*** (0.265)
L.DOMCRE	-0.032 (0.707)	-0.525* (0.315)
EXPORT	-0.781 (0.778)	-0.609 (0.835)
L.EXPORT	0.597 (0.759)	0.597 (0.664)
FDI	0.008 (0.012)	0.0001 (0.011)
L.FDI	-0.013 (0.025)	-0.002 (0.02)
SAV	1.485** (0.752)	0.981 (1.054)
L.SAV	-1.246 (1.262)	-1.234 (1.092)
Constant	2.461 (2.852)	0.88 (0.755)
Hansen test (prob.)	0.423	0.456
Arellano-Bond AR(2) (prob.)	0.249	0.428
Wald Chi ²	6096.04	3019.92
Number of instruments	11	11
Number of components	8	8
Long-term coefficient testing		
Chi ²	0.43	0.43
Prob (Chi ²)	0.513	0.514

Source: authors' computations using Stata 11

In this regard, the present empirical analysis may be developed by identifying distinct independent variables that may influence economic growth and the resumption of econometric estimations. Because the main deficiencies of the econometric study conducted in the paper concern the limited number of variables included in the analysis and the structural breakages present in the data series, highlighted by extreme values compared to the other data, we will consider as future research directions:

- identifying other variables that may influence economic growth and resuming econometric estimates; it may be developed studies on the impact of population variation, unemployment rate, employment rate and / or net national income dynamic on economic growth;
- grouping the data panel with similar features of economy (developed countries and countries whose economies have made significant progress) to limit the presence of extreme values of the observations;
- cancelling the abnormal values, by including dummy qualitative variables in the models.

Conclusions

Economic growth is one of the most complex macroeconomic phenomena, being the expression of national wealth and a central point of economic development. Therefore, the article sought to identify the factors with the greatest capacity to stimulate economic

growth, starting from a data panel on a limited time horizon (1999-2016), which included 20 European countries.

The empirical analysis of economic growth has highlighted that all independent factors analyzed (domestic credit, exports, Foreign Direct Investment and saving) have a positive impact on GDP variation (including GDP per capita). However, it should be noted that there are certain limitations, highlighted by statistical tests that may affect the predictability of the estimated models. This situation may be explained by the presence of structural ruptures in the series of data, generated both in the cross-sectional dimension (the complexity of the analyzed variables – endogenous and exogenous, with many factors influencing their evolution) and in the temporal dimension (the speculative bubble in 2007, followed by the global financial crisis and sovereign debt crisis in Europe, as well as events resonating at the individual level of a country). We can consider as examples:

- *Italy*: in 2013, Foreign Direct Investment resumed (+56,000% vs. 2012), as their volume declined significantly in 2012 (\$ 0.09 billion/ 2012 vs. \$ 17 billion / 2013) against the backdrop of the sovereign debt crisis;

- *France*: reduction in Foreign Direct Investment by -3,435% in 2015/2014 due to instability caused by terrorist attacks;

- *Poland*: the European country least affected by the financial crisis, economic stability compared with other European countries affected by the sovereign debt crisis was the main factor contributing to the increase FDI by 2.387% in 2014/2013.

Econometric results, statistically relevant, showed that although all four independent variables analyzed positively on dependent variables, the main direct influences of economic growth, measured by GDP variation and per capita GDP variation, are the dynamics of domestic credit and saving. Next, for the four catalysts included in the empirical study, we will add some qualitative remarks.

We consider that based on identifying and studying the complementarities between the 20 European economies, alternative solutions and commercial cooperation agreements on weak and complementary sectors may be developed, at individual country level, both between the 20 European countries and between them and third countries outside the European Union, including the development of:

- support and financing mechanisms for exporting companies, integrating those offered by Export Banks (EximBank), Export Credit Agencies (ECAs); the results obtained in the study can be implicitly influenced by the existence of strong European institutions (e.g. Coface, Hermes, SACE, OeKB, EximBank, etc.);

- insurance mechanisms, export guarantee schemes, promotion tools for exporters, support of foreign trade through specific financing products (such as, export factoring);

- cameral associative mechanisms, bilateral agreements;

- products embracing innovation, embedding also import components and contributing to the growth of an economy / country's value chain;

- improved savings solutions and products, to attract more resources to increase their share in bank deposits; taking into account that some of the savings are based on pension systems, on pension funds investing / placing the collected money, we consider it is

necessary to consolidate and continue the efforts to create and develop pan – European pension products¹, within a portable system at the level Member States of the European Union to supplement pensions based on savings-accumulation products.

Considering the nature of the exogenous variables studied in the research (domestic credit, export of goods and services, Foreign Direct Investments, savings), we consider that better coordination in the new political, economic and monetary context may support economic growth. Also at European level, it is necessary to increase cooperation, to integrate the European individual economies in order to develop constructive synergies for the European economy as a whole and implicitly, for distribution of plus value, back to European countries.

The research results for the analyzed components are robust and may be considered support for the future mix of policies, from the perspective of optimizing the tools and resources used to help achieve sustainable economic growth.

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¹ Starting June 2017, the European Commission has launched *The New Pan-European Personal Pension Products*, for the beginning the offer being concentrated at level of some EU State members;

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