

CONTRIBUTION OF THE ROMANIAN AGRICULTURE TO THE ECONOMIC RESILIENCE – EVIDENCE DURING THE RECENT CRISIS

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Abstract

In a country in which about one third of employed population working in agriculture, this paper aim was to evaluate the place and role of the primary sector in Romania's economy resistance in the face of major economic crisis. The economic resilience was investigated in territorial perspective, at NUTS 3 level – the 42 counties of Romania. During the last financial crisis, agriculture was operating as a system with high economic stability and has helped the speed up of recovery process of economic losses generated by crisis. Romania's agriculture is a system with relatively high resilience to shocks and at the same time a supplier of economic and social resilience for the entire economy.

Key words: agriculture, economic resilience, Romania

INTRODUCTION

Given the importance of the primary sector (agriculture) in the Romanian economy and for the rural life, an analysis of this branch is developed in this paper, from the perspective of its contribution to Romania's economic resilience.

The *resilience* concept has its origins in the Latin language, where “resiliere” means *bounce back* or *rebound*. In this context, the economic resilience can be understood as the ability of an economic activity to fast recover from a shock, resistance to the shock effects, the capacity to avoid shocks in general (*firewall* or *shock-absorption*) [6]. In the Briguglio vision, the economic resilience means identifying the ways and manners of solving the issues related to increasing the capacity of averting or recovering the negative effects of external shocks [2].

The objective of this study has in view the analysis of agriculture capacity to actively contribute to the diminution of vulnerabilities and of Romania's economy exposure to the shocks induced by major economic crises, such as the last global financial crisis (from the period 2008-2012) which also affected our country. Agriculture's role as economic resilience factor in Romania is analysed from

the perspective of primary sector contribution to shock attenuation and to the recovery from the last financial crisis that began in 2008.

MATERIALS AND METHODS

For a better interpretation of the place and role of the primary sector in Romania's economy resistance in the face of major economic crises, the economic resilience is investigated in territorial perspective, at NUTS 3 level – the 42 counties of Romania. This approach has in view to reveal the territorial disparities with regard to the amplitude of the economic crisis effects, persistence of these effects and the primary sector contribution to the general economic crisis attenuation and to a faster recovery from the crisis. The analysis across countries provides a better orientation of the intervention needs through public economic restructuring policies in these areas that feature a higher economic vulnerability to crises and a lower capacity to recover from shock [1]. The analytical approach of an economic sector in the territory – agriculture – has in view to identify those areas from Romania in which the primary sector represented a stability factor throughout the

economic crisis, while supplying the resources for economic growth relaunching after the recession period. Thus, agriculture in these areas has proved its capacity to be a territorial economic resilience factor.

The present study was developed having in view the following parameters:

- *recovery time of the gross domestic product (GDP) decline at county level*, which expresses the capacity to recover after the external shocks of the economies of the counties from Romania, hence the economic resilience of the county economic systems (dependent variable);

- *turnover variation in the primary sector*, on one hand, and the *secondary and tertiary sectors*, on the other hand, so as to capture whether and to what extent agriculture has contributed to shock attenuation and recovery from the crisis, in the territory (independent variables). *The turnover of active enterprises* is an important predictor of the development level of a given economy, regardless of the territorial aggregation level – national, regional, at county level, etc. Turnover evolution in time decisively conditions the trajectory of the economy on the economic curb cycle;

- *variation of the employed population volume during the stages of the recent economic-financial crisis* (strong decline: 2008-2010; recovery from the crisis: since 2010-2014), investigated on a comparative basis between the primary sector and the remaining national economy. This indicator reflects agriculture importance as supplier of social security and stability as well as agriculture role in the diminution of the impact of shocks generated by the economic contraction in the rest of the economy.

In order to test the research hypothesis previously mentioned, we appreciate that the analysis of the turnover structure by activity sectors and mainly of its evolution in time allow us to test the primary sector contribution to Romania's economic relaunching after the economic crisis. The disaggregation of these indicators at territorial level can provide significant information on the relation between the economic relaunching and agriculture.

The method used was the multiple linear regression. We shall next consider the counties as functionally integrated subsystems from the economic and social point of view. The statistical data used in the analysis cover the period from the beginning of the crisis up to the recovery of economic performance gaps caused by the crisis and are collected at the level of administrative-territorial units at county level.

RESULTS AND DISCUSSIONS

Recent financial crisis in Romania

The recent financial crisis produced its effects on the Romanian economy, mainly after the year 2008, its implications being revealed by the gross domestic product contraction by 6.6% in 2009 compared to 2008. The economic decline continued throughout the next year, GDP value in the year 2010 reaching 92.4% of its value in the year when the crisis began (Fig. 1).

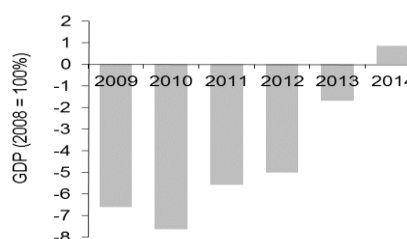


Fig. 1. GDP evolution in Romania in the period 2009-2014

Source: NIS data – TEMPO database. [5]

The statistical data reveal that since 2011, Romania's economy has followed a slightly ascending trend, 2014 being the moment of the full recovery of losses generated by the economic crisis. In the territory, both the incidence of the economic depression and the recovery of the GDP level of 2008 features significant disparities, certain counties being more affected by the crisis than others, while their capacity to surmount the crisis has been significantly different (Fig. 2). Ordering the 42 counties by the average annual GDP rate in the period 2008-2014 reveals that 23 of the economies of counties placed on the left side of the figure below have low resilience, being unable to recover the GDP losses from the crisis period. Furthermore, some of these

counties (Vâlcea, Cluj, Mehedinți, Brăila) had even a stronger economic decline in 2014 compared to 2010, considered as the peak of the crisis period.

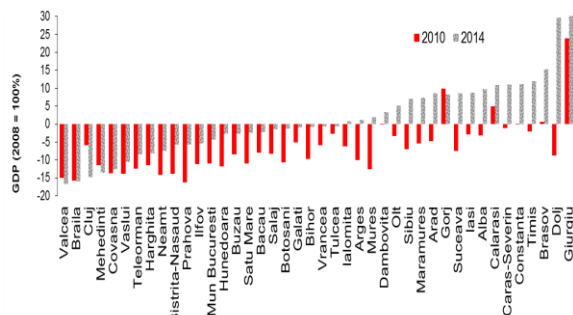


Fig. 2. GDP variation across counties during the financial crisis
 Source: own calculations based on NIS and NCP data. [4, 5]

In the same period, the other 19 counties (placed on the right side into the figure 2) are recovered already from the decline caused by the crisis, hence being considered systems with relatively high economic resilience [6]. The analysis of statistical data by counties reveals the existence of a statistically significant correlation between the intensity of the economic decline induced by the financial crisis (county GDP variation in 2010 compared to 2008) and the capacity to return to the GDP level of 2008. Thus, at the level of counties where the crisis had lower effects, and hence they proved to be more resistant to external shocks, GDP contraction was recovered faster.

Both in newspapers and at academic level it has been acknowledged that agriculture represented a national economic branch with lever effect, significantly contributing to counterbalancing the economic crisis effects upon the entire Romanian economy. We shall next try to test the trustworthiness of these statements that we consider as hypotheses for this part of our study.

Romanian agriculture - an overview

Farm structure in Romania is dominated by the small farms (Fig. 3). According to the data from the last Agricultural census, in the year 2010, the Romanian holdings with a standard output under 8000 euro counts for 97% of total number of holdings and operates 42% from Romanian Utilised Agricultural Area (UAA).

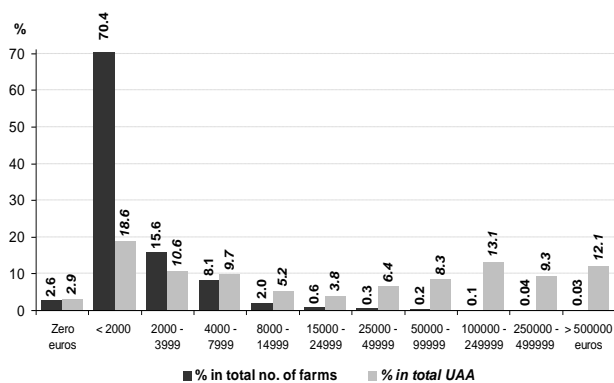


Fig. 3. Farm structure in Romania according to the Standard Output (SO)
 Source: own determination based on EUROSTAT data. [3]

Despite of this unbalanced structure of holdings, the *economic performance* seems to be *higher for the subsistence and semi-subsistence Romanian farms than that obtained on the large-sized farms* on the basis of their production diversification. The statistical data of the last agricultural census 2010 and the Structural survey from 2013 reveals that the small-sized farms in Romania have the highest economic performance. Thus, at the level of farms whose standard value of annual economic output is lower than 2000 euro, the Standard Output per one-hectare Utilised Agricultural Area (SO/1 ha UAA) value is getting closer to the national average. The Romanian farms whose value of annual standard output ranges from 2,000 to 8,000 euro (considered semi-subsistence farms) obtain the highest performance levels per unit of utilised area compared to the farms from the other size categories (Fig. 4).



Fig. 4. Disparities in farm performance in Romania according to their economic dimension
 Source: own determination based on EUROSTAT data. [3]

For the large farms (with agricultural productions whose standard economic value

exceeds 500000 euro annually), the economic efficiency of land use decreased in 2013 compared to 2010; it is, in fact, the only category of farms that recorded such a trend between 2010 and 2013. Therefore, we believe that the large farms have achieved the maximum in the economy of scale paradigm and their economic performance is likely to decrease in the coming period.

Agriculture as resilience factor in Romania

The analysis of the statistical data on the turnover structure of local active units at national level reveals that throughout the last economic-financial crisis, the contribution of the primary sector of the Romanian economy to total revenues from sales of goods, execution of works and from services significantly increased. Thus, while in the first year of the economic crisis agriculture represented only 1.22% of the total turnover of enterprises from Romania, by the year 2012 this share increased to 2.55% (Table 1). The contribution of the secondary and tertiary sectors to total turnover simultaneously decreased.

Table 1. Turnover structure on local units, by national economy branches, 2008-2012 (%)

National economy branches	2008	2009	2010	2011	2012
Agriculture, hunting and related services	1.22	1.60	1.74	2.33	2.55
Sylviculture and forest operation	0.28	0.33	0.36	0.37	0.38
Fisheries and aquaculture	0.02	0.04	0.02	0.02	0.02
Total industry, constructions, trade and other services	98.47	98.02	97.89	97.29	97.06

Source: Own calculation based on NIS, TEMPO online database. [5]

In real terms, these data reveal that throughout the economic crisis, Romania's economic decline was mainly determined by turnover contraction in the secondary and tertiary sectors, while agriculture seems to have had a counterbalancing effect to the economic decline produced by industry, constructions and services.

The analysis of available statistical data across counties, referring to turnover variation as against the moment of economic crisis beginning, reveals how the main economic sectors impact GDP evolution. The multiple linear regression model (Annex 1) reveals that GDP variation across counties (as dependent variable), throughout the economic crisis period, is directly linked to turnover evolution

(independent variable) from the secondary and tertiary sectors, with agriculture having a partial compensation effect for the economic system contraction at county level.

Thus, while in the peak year of economic crisis, i.e. 2010 and throughout the decline recovery period (the last year for which there are available statistical data at county level – 2012), the turnover of active enterprises in agriculture, hunting and related services was net superior to that in 2008, for all the counties of Romania, except for Gorj county. The average yearly turnover growth rate in the primary sector reached 20.5% in the period 2008-2012; only one county had a negative growth rate (Gorj), while in only six counties the turnover in agriculture increased by less than 10%. For the remaining 35 counties, the average value of transactions with agricultural goods and services increased by 10 up to 50 %. Hence, the analysis across counties reconfirms that agriculture had a positive contribution to national economy, counteracting the negative effects of economic crisis.

On the other hand, the secondary and tertiary sectors, which had the greatest contribution to the creation of turnover at national level, in the year 2013 (last year for which data are available) continued to have values of sales of goods and services lower than those in the year when the crisis began, for most counties. In the period 2008-2013, the average yearly turnover growth rate, cumulated for the secondary and tertiary sectors, was negative (-5%). Across counties, only one of the 42 counties of Romania had a positive average yearly turnover growth rate in industry, constructions and services (Arad); for half of the number of counties, the yearly decrease rates of turnover in the secondary and tertiary sectors ranged from -5% to -15%.

The statistical data by counties reveal that in the peak year of the economic crisis (2010), while the active enterprises in the secondary and tertiary sectors restrained their activity in all counties, the turnover of active enterprises in the primary sector stagnated or slightly increased in all the administrative-territorial units of the country (Fig. 5a). Thus, the resilience to crisis of the active economic operators in agriculture proved to be quite

strong.

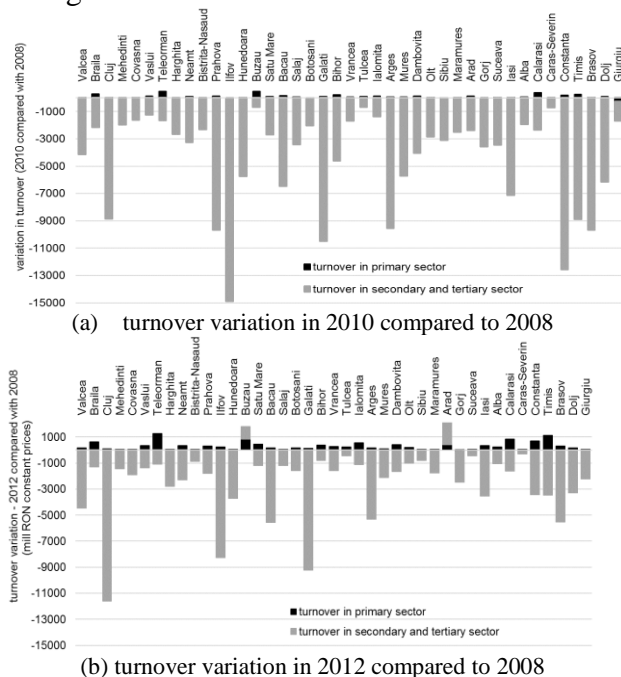


Fig. 5. Turnover variation of local active enterprises, by counties

Source: own determinations based on NIS data (TEMPO on-line and eDEMOS databases). [5]

While the active enterprises in industry, constructions and services are still recovering from the efficiency losses from the period 2009 – 2010, the primary sector continues to improve its capacity to produce economic value and its contribution to GDP recovery at county level. The graphic illustration of turnover variation on local active enterprises by economic sectors, for the year 2012, more clearly reveals the capacity of economic operators from the primary sector to follow a growth trajectory that can also mobilize the other economic sectors to which they provide raw materials.

The primary sector followed a stronger ascending trend in the counties with greater economic resilience (the 19 counties that recovered the GDP losses before 2014, which resulted from the financial crisis, and are found on the right side of the graphic illustration from Fig. 5). It is worth mentioning that for the other counties, with lower economic resilience, agriculture represents the sector where turnover increased, compared to the remaining business segments whose turnover contracted. This reveals agriculture contribution to the

improvement of macro-economic parameters of the economic systems at county level.

Turnover increase in the primary sector of the Romanian economy is associated with the increase of the agricultural production insertion on the market. Thus, the share of the value of marketed agricultural products and services in total production value of agriculture practically doubled in the economic crisis period, increasing from about 17% in 2008 to 38% in 2012 nationwide.

Completing the turnover evolution analysis with the analysis of employed population makes it possible to get an overall vision of the economic recession impact on Romania's counties and on their resilience to crisis. In this context, agriculture represented a high resilience system, not only from the perspective of its contribution to turnover, but also by the stability of jobs provided to active population. Thus, while per total economic sectors, the volume of employed population decreased by 6.1% in 2010 compared to 2008, the population employed in agriculture increased by 1.4%. The active population's return to the primary sector is associated to an economic regress by most analysts. Yet, from social resilience perspective, the capacity of the primary sector to absorb the labour force surplus released from other sectors is represented as a stabilization factor of the economic system, while contributing to the settling down of the potential conflicts emerging from the lack of occupational opportunities. The descending occupational mobility, from the secondary and tertiary sectors towards agriculture, continued until 2012, while in 2013, with the recovery signals from industry, the occupational mobility trend was reversed. However, the total volume of employed population in 2013 remained by 2.5% under its level in 2008, due to labour market contraction in the processing industry and constructions [6].

Under the economic crisis impact, in the period 2008-2010, in the counties with high economic resilience, from the right side of graph from Fig. 6a, one can find a more significant labour transfer from the secondary and tertiary sectors, towards the primary sector. At the same time, in these counties, the

faster economic recovery was due to labour rationalization from industry, constructions and the sector of services, which was more intense than in the counties with lower economic resilience, from the left side of graph. The adaptive response of the active population, materialized into the descending occupational mobility during the crisis, enabled a faster recovery of the economic systems at county level, which was followed, after 2010, by the labour force demand increase in the secondary and tertiary sectors.

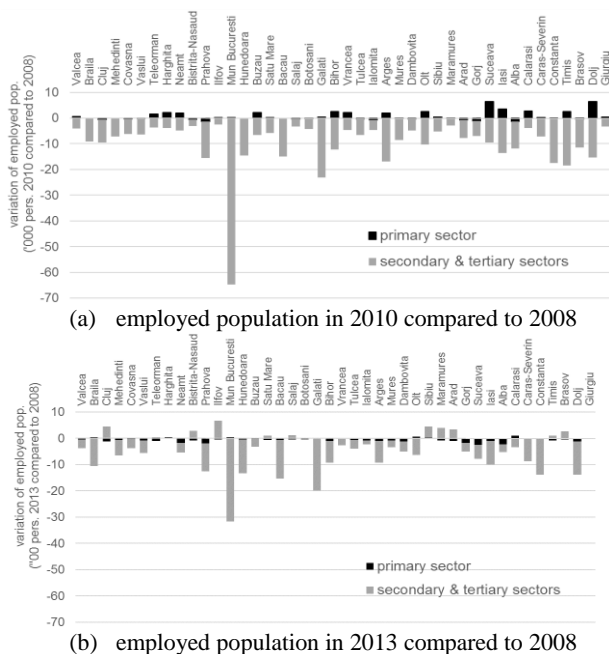


Fig. 6. Evolution of employed population by activity sectors and counties

Source: own determinations based on NIS data, TEMPO on-line database. [5]

In the economic redressing period, 2011-2013, although the counties with economic resilience recovered the GDP loss generated by crisis, the increase of labour force supply in the secondary and tertiary sectors did not follow the same rate as GDP rate, the number of employed persons being lower than that in the year 2008 in 15 of the 19 counties (on the right side of Fig. 6b), which recovered from the decline produced by crisis.

Among the other 23 counties with low economic resilience, only three provided favourable conditions for the increase of the employed population volume, the labour transfer from the primary sector towards the

other economic branches having a much lower incidence in these counties compared to the counties with high economic resilience.

Table 2. Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.496 ^a	.246	.207	1.52840	.246	6.366	2	39	.004

a. Predictors: (Constant), average yearly growth rate of turnover for the active enterprises in primary sector (agriculture, hunting and related services) -TurnAgri; average yearly growth rate of turnover for the active enterprises in secondary and tertiary sectors (industry, constructions, trade and other services) - TurnOther
 b. Dependent Variable: GDP's average yearly growth rate

ANOVA^b

Model	Sum of Squares	Df	Mean Square	F	Sig.
1					
Regression	29.743	2	14.872	6.366	.004 ^a
Residual	91.104	39	2.336		
Total	120.847	41			

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error				Lower Bound	Upper Bound
1	(Constant)	2.026	.598		3.389	.002	.817	3.236
	TurnAgri	-.227	.072	-.444	3.166	.003	-.082	-.372
	TurnOther	-.035	.017	-.290	-2.067	.045	-.070	-.001

a. Dependent Variable: GDP's average yearly growth rate

CONCLUSIONS

In Romania the primary sector contribution to counterbalancing the negative effects on GDP and labour employment generated by the recent economic crisis, by increasing the turnover value in agriculture and reasserting the role of occupational outlet in the conditions of scarcity on the labour market, represent a few arguments in favour of the statement that Romania's agriculture is a system with relatively high resilience to shocks and at the same time a supplier of economic and social resilience for the entire economy.

REFERENCES

- [1]Augustine, N., Wolman, H., Wial, H., McMillen, M., 2013, Regional Economic Capacity, Economic Shocks and Economic Resilience. Washington, DC: MacArthur Foundation Research Network.
- [2]Briguglio, L., Cordina, G., Tarrugia, N., Vella, S., May, 2008, Economic Vulnerability and Resilience. Concepts and Measurements, UN University WIDER World Institute for Development Economics Research, Research paper no. 2008/55.
- [3]EUROSTAT database.
- [4]National Commission for Prognoses (NCP), *Prognoses*, www.cnp.ro.
- [5]National Institute for Statistics (NIS) – TEMPO on-line database and eDEMOS database, www.insse.ro.
- [6]Zaman, Gh., Georgescu, G. (coord.), 2015, Dezvoltarea economica endogena la nivel regional: cazul Romaniei, Expert publishing house, Bucharest.