MACROECONOMIC POLICIES AND FORESTRY IN ROMANIA

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Abstract: This paper discusses the potential impacts of macroeconomic policies of Romania on forestry and indirectly from forestry to macroeconomic policies. After the 1989 Revolution, macroeconomic policies returned from a centrally controlled economy to a liberalized economy, and the impact of macroeconomic policies (including laws and political decisions) on forestry development have been rather negative. Privatizations that led to the dismantling of energetic and industrial complexes, lack of commitment and lack of public accountability which led to deindustrialization, massive collective and individual lay-offs and the degradation of the agricultural sector and the gradual loss of the economic and biological patrimony of the country were the dominant elements that characterized the Romanian macroeconomic policies in the last two and a half decades until now. Thus, the article tries to extract a series of theoretical and practical elements on the two issues addressed: macroeconomic policies and the forests situation in Romania.

Keywords: macroeconomics, impact, forestry, forest economics.

JEL Classification: E61, Q01, Q23

1. Introduction

According to the Report on Romania's State of Forests in 2013, the total area of Romania's national forest fund was 6,539 thousand hectares, accounting for 27.4% of the country's surface, below the European average (32%). Romania has considerable areas of natural, virgin and quasi-virgin forests. The area of virgin forests, according to government authorities, was 5898.92 hectares (evaluated over a period between 2007 and 2017), while the quasi-virgin forests area was 12397.84 hectares. Of course, the value of the forest fund exceeds the contribution made to the wood and forestry exploitation and forestry in general, the role and functions of Romania's forests being also in the direction of soil stabilization, drought and floods control, forest protection curtains, greenhouse gas sequestration, biodiversity, the regeneration of degraded lands and, in general, in mitigating the effects of climate change, but also in terms of providing the energy resource or fulfilling important social and cultural functions. Therefore, it is essential to see not only the beneficial effect of Romania's forests on the society: environment, climate and economy, but also vice versa, of macroeconomic policies - implicitly reflected in the evolution of some macroeconomic indicators of Romania - on the situation of forests.

2. Literature overview

The literature captures a rather incomplete analysis of the link between economics and ecology, which can be explained in objectives of different interest and sometimes divergent perspectives for the two categories of economists and ecologists. Economists often seem to exclude the global and complex nature of ecological effects on the economy, while ecological realities are different and do not allow aggregation from one ecosystem to another. This aspect is noted by Sohngen et al. (2007), which considers that ecologists take into consideration and incorporate in their models the importance of economic decision makers (implicitly the alternative ways of economic development) for observing the impact on ecological systems, but often exclude the feed-back of ecological systems on the economy. Equally, economists do not seem to be interested in all the implications that the complexity of ecological systems can have on economic decisions. However, a series of previous studies (Aaheim et al., 2010, van Vuuren et al., 2006, Sohngen and Mendelsohn 2003, etc.) address the subject of impact of climate change on forestry, integrating economic and ecological

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models, focusing more or less on adapting to climate change within regions and identifying the consequences of the global environmental and economic impact on forests.

Thus, if we refer to the situation of forests, the economic implications go beyond the level of the implications of the material value of the cut wood and of the additional wood products, entering into extremely serious biodiversity, environmental, cultural and social issues, some relatively subtle, (e.g. desertification, landslides, natural disasters, rural unemployment, depopulation, material and human losses caused by the reduction in the quantity and quality of the forest etc.). It should be noted that the disappearance of the areas covered with forest vegetation can lead to the alarming increase of the special climatic phenomena and to the increase of the anthropic pressures both in terms of their intensity and their frequency of occurrence. The forest is a renewable source of diverse products (raw materials needed by the pharmaceutical industry, resins, medicinal and aromatic herbs, edible mushrooms, fauna, berries, seeds, shrubs, etc.), as well as beneficial effects impossible to quantify financially, being extremely complex ecological system. In some studies (e.g., Amacher et al., 2005), it is noted that mitigation of climate change can be achieved through a coherent and responsible forest management, outlining the need to maintain forest diversity and permanent reforestation as wood harvesting.

3. Methodology

This article studies mainly the impact of Romania's macroeconomic indicators on forests; in the opposite direction, the macroeconomic implications of the changes in the parameters describing the realities of forestry should be regarded with caution, especially since the contribution of agriculture, forestry and fishing represents only a small part of the Romanian economy (below 5% of GDP, for the 2015-2017 period, according to National Institute of Statistics of Romania or NIS). However, on the one hand, according to the NIS, the contribution of the agricultural, fisheries and forestry sector to Romania's GDP is increasing in the last period (2015-2017), and on the other hand, forestry is an integral part of the Romanian economy. Thus, the adaptations of the forestry sector to the Romanian macroeconomic realities can be proved, at least in part, by a relatively simple econometric analysis. This article uses national and international statistical databases such as those of the National Institute of Statistics of Romania, the National Bank of Romania and Eurostat. The analysis period varies depending on the availability of the data, but for the econometric analysis, the period 2004-2016 was followed, the frequency of the data being annual, imposed by the systematization and relevance of the macroeconomic indicators. The conclusions drawn may indicate the methodological reserves required by a limited set of data.

4. Results and discussions

After the 1989 Revolution, macroeconomic policies have returned from a centralized economy to a liberalized economy, and the impact of macroeconomic policies (including political laws and decisions) on forest development has been rather negative. Privatizations that led to the dismantling of energy and industrial complexes, lack of commitment and lack of public accountability led to deindustrialisation, massive collective and individual redundancies and the degradation of the agricultural sector, as well as to the gradual loss of the country's economic and biological heritage, were the dominant elements characterized Romania's macroeconomic policies in the past two decades and a half to the present. Fiscal-budgetary reforms, often incomplete and incoherent, changes in direction in monetary policy, but also agreements signed with international institutions, especially with the IMF, have led to extremely painful conjectural and structural restructuring for Romania's economy and especially for citizens. These macroeconomic policies, generally weak and lacking in vision, have led people to look for livelihoods in agriculture, resulting in migration to rural areas

(especially the elderly population) or emigration abroad (especially the younger population for work). This has led to limited natural and human resources in rural areas, especially since the policies and laws for restitution of agricultural and forest land have not generated much benefit for the descendants of the old owners, but rather for the various intermediaries and speculators. Although it appears to be a minor and somewhat isolated problem in agriculture, the current natural disasters that are occuring with a frightening fervor in our country draw attention that forests are not so much an individual resource but rather an element of collective survival at national level, regional and even planetary.

Thus, if we follow the evolution of annual deforestation in Romania, we observe (according to Table 1) that during the period 2000-2010 the annual growth rate was positive. Timber production also increased significantly over the period 2005-2015, roundwood processing increased in the period 2005-2015, while the gross added value of the forestry industry at base prices (in million / EUR) declined significantly in 2015 compared to 2005. This shows inconsistency in the proper management and valorisation of the forest fund in our country as well as in the export of unprocessed wood products or with minimal processing and thus with low added value.

Table 1 Several Eurostat indicators relevant to the situation of the forestry industry in Romania

	2000	2005	2010	2015	Growth rate (%)*
Annual deforestation as a share of net annual growth (annual net increase, 1 000 m3 over shell)	28591.07	28703.62	29259.98		2.34
The production of round wood (1000 m3)		14501.00	13111.64	15314.70	5.61
The total production of timber (1000m3)		4321.00	4323.00	5935.81	37.37
Woodworking by type of wood and assortment (thousand cubic meters)		13970.00	13111.64	15314.70	9.63
Gross value added of forestry industry at basic prices (mil ECU / EUR)		314.29	446.21	127.77	-59.34

Source: Eurostat, author's calculation, Growth rate, * refers to the growth rate of the last year for which data are available relative to the first year for which data are available.

Moreover, the growth rate of the forest fund (thousands of hectares) in the period 2010-2015 was lower than the growth rate of the total volume of harvested wood (thousands of cubic meters) (Table 2), indicating other elements of policy inconsistency public and private forests management of Romania.

Within this framework, undergoing in a continuous updating, the legislation, in order to best respond to the role and functions that forests should fulfill, has often failed to mitigate the negative effects of inefficient management. Sometimes, it generated controversies and disputes over the legal regime of some forest areas.

In the total forestry fund, the share of the state owned forestry fund is dominant (approximately 47% of the total forestry fund), but the share of the private property forestry fund is gradually increasing. Following the restitution of forest land, there has been a diversification of ownership, not always beneficial to society, especially in the medium and long term.

In addition, observance of the forestry regime in the absence of the forest inspector and regular inspections becomes problematic, as in recent years there has been an increase in the illegal cutting of the forest fund both in public and private ownership. At the same time, harvesting a considerable amount of wood (as being accidental products (including tree stands) and hygiene products) points out that besides the legal cuts due to the natural drying phenomenon, also certain forms of masking the illegal cuttings. Equally, illegal cuts can be partly justified by the lack of state support for the protection of forest owners (e.g. to facilitate guarding, payment of the value of products that the owners do not harvest in situations due to certain specific unfavorable conditions, facilitation of association of forest owners, support for combating diseases and pests of forests, supporting the ecological reconstruction of agricultural land by afforestation, etc.) and less proper management of forest roads and access roads to wooded areas. However, according to Romania NIS data (see Table 2), artificial regenerations, although fluctuating between 2010 and 2015, recorded a growth rate of 17.22% in 2015 compared to 2010, which may create some feelings of optimism on better management of forests.

Table 2 Several indicators of Romania National Institute of Statistics relevant to the situation of the forestry industry in Romania

	2010	2011	2012	2013	2014	2015	Growth rate (%) (2015 compared to 2010)
Total forest fund (thousands of hectares)	6515	6522	6529	6539	6545	6555	0.61
Forests area (thousands of hectares)	6354	6365	6373	6381	6387	6399	0.71
Total volume of harvested wood (thousand cubic meters)	16992	18705	19081	19282	17889	18133	6.71
Total artificial regeneration (hectares)	10106	11499	11026	10437	12508	11846	17.22
Surface covered with regeneration cuts (hectares)	99229	107690	109615	109738	100981	98453	-0.78

Source: Romania National Institute of Statistics, Statistical Yearbook of Romania 2016, author calculation of growth rhythm.

At the same time, at least for the energy resources (biomass), Romania is a wood importer, and the impact of the international price changes in Romania will therefore depend on the world and regional market of firewood, including what is happening with forests in other countries amid climate change. Given that more than 3 million Romanians are currently heating up with firewood at import tariffs over those practiced in Serbia, Poland, France and even Germany, an emergency solution would be to that the state to facilitate, through Romsilva, the population's access to a cheaper and reasonably priced firewood (exceeding the threshold set of 15% of the woods harvested in the state forests), and on a horizon of several years switching to gas heating or facilitating the purchase of renewable heating sources and, in cities, putting into (re)operation the centralized heating sources.

If we look at the situation of the forest fund and the area of the forests correlated with the main macroeconomic indicators of Romania for the period 2004-2016, we can observe (Table 3) that, excluding the correlation between the macroeconomic indicators between them and the forest indicators among them, the correlation matrix shows somewhat awaited results.

For example, between 2004 and 2016, the area of forests is strongly correlated negatively with the average interest rate of banks, non-banking, non-governmental clients, which indicates a mature and responsible process of society rather than an ad-hoc correlation. As Romanian society moved to a liberalization of the financial and capital market, interest rates on loans gradually slowed down over time. Public debt has seen an upward trend as the modernization needs of the Romanian society have increased, inflation has fallen sharply on the background of a relatively restrictive monetary policy, and the exchange rate has seen an upward trend driven by incoherence in economic policy and commercial - the competitiveness of Romanian products is supported by price and, to a lesser extent, by quality. At the same time, awareness of ecological problems has become even more important, so the importance of maintaining and increasing the area of forests has become noticeable for the entire Romanian society. It is important to note that correlation does not imply causality, so caution is required in interpreting, beyond the fact that the data set is extremely low.

Table 3. The matrix of correlation between indicators of the forests situation and macroeconomic indicators of Romania

	GDPr	*HICP*	*AER RON/EUR*	*GGD*	*Def guv*	*CAB*	*AABIR*	*NoEmpl*	*FA*	*FF*	*FF Pub*	*FF Priv*	*WVTH*
FA	-0.29	-0.90	0.73	0.85	-0.17	0.45	-0.91	-0.13	1				
FF	-0.30	-0.89	0.71	0.83	-0.19	0.41	-0.90	-0.11	1	1			
FF Pub	0.39	0.79	-0.75	-0.81	0.34	-0.41	0.83	0.12	-0.97	-0.97	1		
FF Priv	-0.38	-0.81	0.74	0.82	-0.32	0.41	-0.84	-0.12	0.98	0.98	-1.00	1	
WVTH	-0.15	-0.48	0.67	0.77	0.08	0.42	-0.48	-0.47	0.68	0.68	-0.69	0.69	1

Source: NBR and NIS of Romania data, author calculations, color code: - very light gray interval [0.75; 1], - light gray interval [0.50; 0.75), - gray average range [0.25; 0.50), - dark gray interval [0; 0.25). Notes: GDPr - real GDP (% change as of 2005, data refer to industrial production), HICP - Inflation (HICP) (average annual change rate %), CSRON / EUR average exchange rate of the period, DP - Gross government debt (% of GDP), Defguv - Government deficit / surplus (% of GDP), CAB - Current account balance (net) non-governmental clients (% pa), RMDA - Average active bank interest rate, non-banking, non-governmental clients (% p.a.), NoEmpl - Number of employees in the economy (thousands of persons), FA – Forests area (thousand hectares), FF - Total forestry fund (thousands of hectares), FFPub – Public Forest Fund (thousands of hectares), FFPriv - Private Forest Fund (thousands of hectares), WVTH- Wood volume totally harvested (thousands of cubic meters).

Based on the correlation matrix, it has been taken into account only the link between forest-specific indicators in relation to macroeconomic indicators, considering that the former may be influenced by the latter, although, as we have seen above, the effects of poor forest management at the level of a country can have strong negative effects in many plans, far exceeding the economic sphere. Thus, in the calculation of the regression equation for the relation between the forest area and a series of macroeconomic indicators, we followed only the indicators with a relatively strong correlation (interval [0.75, 1] and [0.50, 0.75) respectively) (Table 4).

Table 4 The result of the regression equation considering the link between the forests' area and the average bank interest rate (% pa) (AABIR), inflation (HICP) (average annual change rate %), gross government debt (% of GDP), period average exchange rate ($AER_{RON / EUR}$)

SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.98
R Square	0.95
Adjusted R Square	0.93
Standard Error	16.38
Observations	13

ANOVA	*df*	*SS*	*MS*	*F*	*Significance F*
Regression	4.00	42449.90	10612.47	39.54	0.00
Residual	8.00	2147.33	268.42		
Total	12.00	44597.23			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	6141.52	124.16	49.47	0.00	5855.21	6427.82	5855.21	6427.82
AABIR	-8.98	2.69	-3.33	0.01	-15.20	-2.77	-15.20	-2.77
HIPC	3.24	4.45	0.73	0.49	-7.01	13.50	-7.01	13.50
GGD	-0.52	1.81	-0.29	0.78	-4.70	3.65	-4.70	3.65
$AER_{RON/EUR}$	77.05	44.12	1.75	0.12	-24.68	178.79	-24.68	178.79

Suorce: NBR şi Romania's NIS data, author's calculation

Thus, the simple linear regression model proposed in the study of forest surface evolution (Yt) is analyzed according to AABIR, HICP, GGD and $AER_{RON/ EUR}$ (Xt) and has the following simplified formula:

$SP = f(AABIR, HICP, GGD, AER_{RON/EUR})$ sau

$SP = c(1)+c(2)*AABIR+c(3)*HICP+c(4)*GGD+c(5)*AER_{RON/EUR} +\varepsilon t$

Analyzing the value of the determination coefficient or R^2, which is used to measure the intensity of the correlation between the endogenous variable and its determinants, it is observed that the value of 0.95 is very good. At the same time, with respect to the adjusted R^2, it is equal to 0.93 at the sample level, suggesting a very strong correlation between the variables in the model.

One of the problems of any regression model is how to determine the parameters. In this case, we used the generalized least squares technique provided by the Excel Data Analysis toolkit. The use of this tool allowed estimation of model parameters. The values of the estimated coefficients in the sample are c (1) = 6141.52, c (2) = -8.98, c (3) = 3.24, c (4) = -0.52 and c (5) = 77.05. The coefficient c(1) shows the value of the forest area if the value of the other variables is zero, the coefficient c (2) shows the level of the forest surface growth when the bank active interest rate increases by one unit, the coefficient c(3) shows the level of growth of forests when inflation increases with one unit. The coefficient c (4) shows the level of growth of forests when public debt increases by one unit, and the coefficient c (5) shows the level of forest growth when the exchange rate between the national currency and the euro increases by one unit. Based on the values of the coefficients, it is noted that the sign is positive for inflation and the exchange rate, so the correlation of each of these indicators with the surface of the forests is direct, while we can say that we have an inverse correlation between the forest area and the public debt respectively between the forests and the active bank interest rate. Based on the results in Table 4, it is noted that although most of the coefficients are significantly different from zero, they have an associated probability or a p-

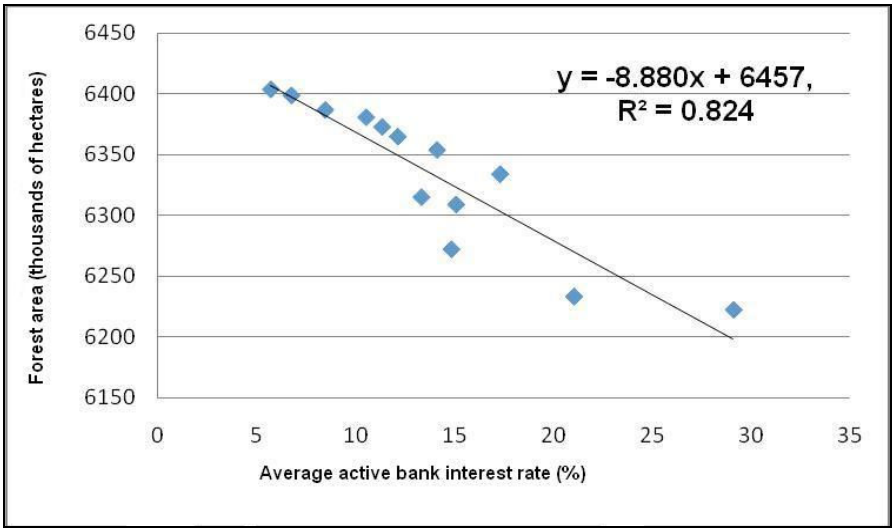
value well above 0.05, and only AABIR, except c (1), has a p-value probability of 0.01, which confirms that only this is significant in the total statistical population and that only for this indicator, the null hypothesis H0 is rejected. Thus, for this model (2) the model was correctly specified, identified and evaluated.

Thus, it can be considered that the influence on the dependent variable comes from only one factor, and the most commonly used method is the scatter graphic representation.

Therefore, in the first figure, the relationship between the average bank lending interests rate (% p.a) (AABIR) and the area of forests (thousands of hectares) (FA) was graphically represented (see Figure 1). Observing the value of the determination coefficient or R^2, we can say that the intensity of the correlation between the endogenous variable and the determinant variable is very good (R^2 = 0.824). Noteworthy, if we look at the situation in the opposite direction, the independent variable being the surface of the forests, and the dependent variable the average interest rate of the banks, the equation changes to y = -0.092x + 601.7, the indicators keeping an inverse correlation in both cases.

If we analyze the link between the publicly owned forest fund and the following indicators: average commercial bank interest rate (%), gross public debt (% of GDP) and inflation (HICP) (annual average change rate %) (Table 5) we find that only for public debt the p-value probability is 0.03, which confirms that only this indicator is significant in the total statistical population and that only for this indicator, the null hypothesis H0 is rejected. Thus, for the public debt only, the model was correctly specified, identified and evaluated.

Figure 1. The Link between the Average Active Bank Interest Rate (% pa) (AABIR) and Forest area (thousands of hectares) (FA)



Source: NBR and Romania's NIS data, author calculations

Table 5 The result of the regression equation on the link between the publicly owned forest fund and the average active bank interest rate (% pa) (AABIR), gross public debt (% of GDP) and inflation (HICP) (average annual change rate %)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.91
R Square	0.82
Adjusted R Square	0.76
Standard Error	150.10
Observations	13

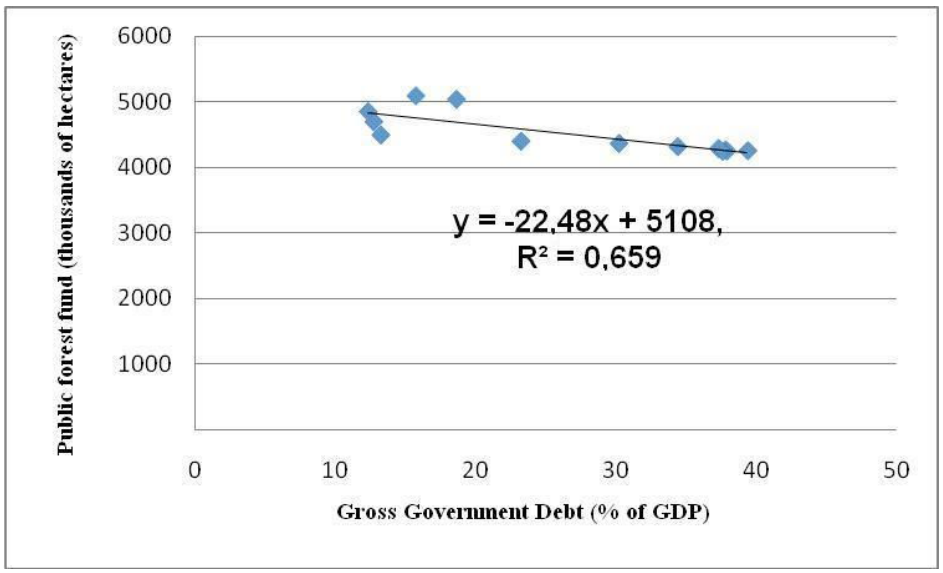
ANOVA	*df*	*SS*	*MS*	*F*	*Significance F*
Regression	3.00	944816.53	314938.84	13.98	0.00
Residual	9.00	202781.77	22531.31		
Total	12.00	1147598.31			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	4510.52	247.01	18.26	0.00	3951.74	5069.29	3951.74	5069.29
AABIR	41.34	20.36	2.03	0.07	-4.72	87.40	-4.72	87.40
GGD	-15.37	5.79	-2.66	0.03	-28.46	-2.27	-28.46	-2.27
HICP	-33.39	38.28	-0.87	0.41	-119.98	53.19	-119.98	53.19

Source: NBR and Romania's NIS data, author calculations

Again, in order to better exemplify the link between public debt (% of GDP) and the state property (thousands of hectares), we can use a scatter chart (Figure 2). The value of the determination coefficient or R^2 (R^2 = 0.659) is much lower in this situation, but it retains an important explanatory value for the correlation and determination of the analyzed elements.

Figure 2. Link between gross government debt (% of GDP) and public forest fund (thousand hectares)



Source: NBR and Romania's NIS data, author calculations

The last regression equation used from an economic perspective can have a more meaningful meaning in the sense that it links the Wood volume totally harvested (thousand cubic meters) (WVTH) and gross government debt (% of GDP) (GGD), as well as the RON /

EUR exchange rate (average of the period) ($AER_{RON/EUR}$). The equation has the following simplified formula: WVTH = (GGD, $AER_{RON/EUR}$).

Analyzing the value of the coefficient of determination or R^2 of the equation set above we find that the intensity of the correlation between the endogenous variable (WVTH) and its determinants is relatively good (0.62). At the same time, with respect to the adjusted R^2, it is equal to 0.54 at the sample level, suggesting a somewhat satisfactory correlation between the variables in the model.

The values of the coefficients estimated at the sample level in this case are: c (1) = 19364.75, c (2) = 125.10 and c (3) = -1305.19. The coefficient c (1) shows what would be the value of the total volume of the harvested wood (thousand cubic meters) if the value of the other variables would be zero, the coefficient c (2) shows the level of increase of the total volume of the harvested wood (thousand cubic meters) when the public debt increases by one unit, and the coefficient c (3) shows the level of increase of the volume of total wood harvested (thousand cubic meters) when the Leu / Euro exchange rate increases by one unit. Based on the values of the coefficients, it is noticed that the sign is positive for the public debt, so the correlation of the public debt with the volume of the total harvested wood (thousand cubic meters) is direct, while we can say that we have an inverse correlation between the volume of wood total harvested (thousand cubic meters) and exchange rate. Based on the results in Table 6, it is noted that although the coefficients are significantly different from zero, they have an associated probability or a p-value well above 0.05 or slightly above 0.05 in the case of public debt. For this reason, we can assume that the proposed indicators do not allow the rejection of the null hypothesis. Thus, so further attempts will be needed to find more appropriate parameters.

Table 6 The result of the regression equation in relation to the total volume of harvested wood (thousand cubic meters) and the gross government debt (% of GDP) and the RON / EUR exchange rate (average of the period)

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.79
R Square	0.62
Adjusted R Square	0.54
Standard Error	789.99
Observations	13

ANOVA	*df*	*SS*	*MS*	*F*	*Significance F*
Regression	2.00	10132420.51	5066210.25	8.12	0.01
Residual	10.00	6240826.72	624082.67		
Total	12.00	16373247.23			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95,0%*	*Upper 95,0%*
Intercept	19364.75	5112.69	3.79	0.00	7972.96	30756.54	7972.96	30756.54
GGD	125.10	58.32	2.14	0.06	-4.85	255.06	-4.85	255.06
$AER_{RON/EUR}$	-1305.19	1601.82	-0.81	0.43	-4874.26	2263.89	-4874.26	2263.89

Source: NBR and Romania's NIS data, author calculations

It should be noted that all the results obtained with regard to Romania should be interpreted with caution, the link between numerous forest indicators and a series of macroeconomic variables may contain a number of forceful, especially interpretative

elements, considering that the available data set is extremely limited. However, the outcomes of this article can help to create a clearer, more honest and inclusive horizon in understanding the impact of policy implications and macroeconomic realities on the various important ecological and economic spheres such as forests. The adverse impact, though harder to evaluate and quantify economically, may prove to be even more valuable, with the possibility of developing alternative scenarios of involvement in forest management policies and obtaining macroeconomic outcomes (for example, an active, stimulation of regeneration and, implicitly, wood harvesting in forests can lead to a better contribution of this area to the creation of GDP).

5. Conclusion

This article is an initiative to explore, collect, process and link information on the state of forests in Romania in relation to macroeconomic policies and developments. The main purpose of the study is to provide a better understanding of the realities and relationships between macroeconomics (implicit society) and forests, thus facilitating a series of adjustments, reforms and scenarios on the future of macroeconomic policies and forest management policies in Romania.

The article analyzes predominantly the impact of Romania's macroeconomic indicators on forests and less a link in the opposite direction, considering that the contribution of agriculture, forestry and fishing to real GDP support is modest. Thus, the adaptations of the forestry sector to the Romanian macroeconomic realities can be proved, at least in part, by a relatively simple econometric analysis, using national and international statistical databases for a period from 2004 to 2016. Following a limited series data, the conclusions drawn from the analysis should be interpreted with reservations.

At the same time, following the evolution of the annual forest deforestation in Romania, it can be noticed that during the period 2000-2010 the annual growth rate was positive and the production of timber and round wood processing increased in the period 2005-2015, while the gross added value of the forestry industry at base prices (in million / EUR) declined significantly in 2015 as compared to 2005. Equally, the growth rate of the forest fund (thousands of hectares) over the period 2010-2015 was below the growth rate of the total volume of harvested wood (thousands of cubic meters), proving an unsatisfactory forest management policy in our country.

Looking at the situation of the forest fund and the forests' surface in relation to the main macroeconomic indicators of Romania for the period 2004-2016, based on the correlation matrix, we can note that, excluding the correlation between the macroeconomic indicators between them and the forest indicators among them, the correlation matrix indicates somewhat expected results. For example, between 2004 and 2016, the area of forests is strongly correlated with the average interest rate of banks, non-banking, non-governmental clients, which indicates rather a growing up process of Romanian society because interest rates on loans gradually were decreasing in time. Also, the government debt registered an upward trend as the modernization needs of the Romanian society increased, the exchange rate was increasing due to the incoherence in the economic, monetary and commercial policies, and the inflation was shaped in a decreasing direction on the grounds of relatively restrictive monetary policy. Equally, the awareness of ecological problems and the importance of maintaining and increasing the area of forests have become noticeable in Romanian society.

Looking at the results of the regression equation linking forests area of the active interest rate, inflation, exchange rate and government debt, it is clear that only for the average active interest rate the model was correctly specified, the forests area indicators and the active interest rate, retaining a strong correlation, but in the opposite direction. At the same time,

analyzing the link between the publicly owned forest fund and the following indicators: the average interest rate of commercial banks, gross government debt and inflation, we might conclude that only in the case of government debt the model was correctly specified. Practically, the two regression equations demonstrate a possible link between the total forests area (and respectively of the public property forest fund) with the issue of private indebtedness (the commercial bank's interest rate) and respectively with government debt (the evolution of public debt as percent of GDP). If in the former case the significance of the link is less obvious, in the second it clearly highlights a flagrant deficit of strategy in the management of the public property forest fund as an effective means of reducing or moderating the increase in government debt. This remark can also be supported by the strong and direct correlation between the evolution of the total volume of harvested wood (thousand cubic meters) and the gross government debt (% of GDP), thus the increase in the volume of extracted wood not leading to the reduction of the public debt.

Taking into account that the available data set is extremely small, the results obtained for Romania need to be interpreted with caution, sometimes leading to forced interpretations. However, the article may provide important theoretical and practical openings on the link between policy developments and implicitly the main macroeconomic parameters and the situation of forests in Romania.

6. References

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