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ROMANIA'S BUDGETARY DEFICIT IN 2018 AND ITS FORECAST FOR 2019. DIMENSIONS AND FINANCING

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Abstract: *The recent economic crisis has revealed the failure of some cognitive and operational models to relaunch the economic activity. The most representative example is the thesis that price stability is equivalent with financial stability, with the full use of resources. In the current period, we hear more and more of the idea that the budgetary deficit becomes a means of relaunching the economic activity, given the fact that it is not already inflationary. Acting on the demand for public goods and services is possible by using short-term action funds, thus achieving a flexible budgetary policy. Within this, public spending can be resized in relation to the size of these funds. If no changes are made in the regulation of taxes, the tax revenues can be short term adjustment tools. The idea that the budgetary deficit would be a particularly important problem for the economy is partially true, since it must still exist. Through it, the redistribution of income between generations is assured, fiscal relaxation in case of variation of income subject to taxation is assured etc.*

Keywords: *deficit, budget, public administration, economic crisis, financing, investments.*
JEL Classification: *H62.*

1. Introduction

In the current period, the idea that the budgetary deficit becomes a means of relaunching the economic activity is issued more and more, given that it is not already inflationary (Cioponea, 2007). It is possible to act on the demand for public goods and services through the use of short-term action funds, thus creating a flexible budgetary policy, within which public spending can be resized in relation to the size of these funds. If no changes are made in the regulation of taxes, the tax revenues can be short term adjustment tools.

In this sense, a process of crucial importance is the improvement of public expenditure. The desired goals can be achieved more efficiently, sometimes faster and at lower costs, without reducing the quantity or quality of the provided services. It is enough to eliminate the excessive staff from the central and local administration in order to observe a decrease in the supply costs of certain public services (Kolodko, 2015).

Moreover, the Government is considered to be the only economic actor that can maintain the level of demand in the economy, spending more than it earns, that is, registering a budgetary deficit (Chang, 2014).

In turn, the economic crisis of the past years has revealed the failure of some cognitive and operational models. Some authors consider that the most important example is the thesis that price stability is equivalent with financial stability, with the full use of resources (Dăianu, 2015).

The idea that the budgetary deficit would be a particularly important problem of the economy is partially true, since it must exist though. By its means, the redistribution of income between generations, fiscal relaxation in case of the variation of the income subject to taxation etc are ensured.

2. Romania's Budgetary Deficit in 2018

2.1. Economic Situation and Synthetic Budgetary Indicators

For the year 2018, an economic growth of 5.5% was predicted in Romania, being the eighth consecutive year of positive evolutions (after 1.1% in 2011, 0.6% in 2012, 3.5% in 2013, 3.1% in 2014, 3.9% in 2015, 4.8% in 2016 and 5.2% in 2017), which places us among the first countries, from this point of view in the EU28. This increase was due to the contribution of the following factors:

- domestic demand seen as the engine of the economic growth (+ 6.1%), within it being provided close dynamics of the total final consumption (+ 5.8%) and the gross accumulation (+ 6.9%);
- the growth rate of gross fixed capital formation forecast at 7.9%;
- expenditures with the final consumption of the population predicted as having a real annual dynamic of 6.5% (MPF, Raport execuţie bugetară 2018).

Economic growth was due to the positive contribution of domestic demand, for both consumption and investment, of 5.7 percent, while population consumption, on the backdrop of higher inflation and a more restrictive monetary policy, slowed its growth in the last 2 years increasing by 5.3%.

The data show that the year 2018 was a good year from the point of view of investments, a significant improvement of the relation consumer-investments-savings for the population being observed. Thus, given the slowdown in the dynamics of consumption that took place under the conditions of a 14.8% increase in net nominal average earning (+9.7% in real terms), it turns out that a significant part of the additional income went towards investments or savings. At the same time, gross accumulation (gross investments plus stock accumulation) accelerated its growth to 9.6% in 2018 (from 4.2% in 2017). Investments in the economy, respectively the gross accumulation, reached in 2018 a value of 200.4 billion lei, compared to only 175 billion lei in 2017, increasing by 14.5%. Within these, the gross fixed capital formation decreased by 3.2% compared to 2017. At the same time, the stock variation registered a positive contribution of 2.9 percent (MPF, Raport execuţie bugetară 2018).

In 2018 there was an increase in consumer prices on average by 4.63%, compared to 2017, based on the increase in prices for non-food goods (6.20%), while for food goods prices increased by 3, 75%, and service tariffs with 2.53%.

The increase registered in 2018 was due both to exceeding the statistical effect associated with the fiscal relaxation measures from the beginning of 2017 (reducing the VAT rate and eliminating the overcharge and some non-fiscal taxes), increasing the international quotations on crude oil (+ 33.1% compared to the year 2017), as well as the price increases for the energy group (+10.4% in 2018 compared to the previous year). The nominal depreciation of the national currency, which was 1.84%, also had an important contribution.

For the year 2018, the general public administration deficit was calculated on the basis of the data transmitted by the public institutions and the temporary ones of the state companies classified in the public administration, the resulting deficit (semi-final data) according to the ESA 2010 methodology being 3% of GDP.

Compared to 2017, the deficit calculated according to the ESA 2010 methodology in 2018 increased by 0.3 pp from 2.7% of GDP in 2017 to 3% of GDP in 2018.

The budgetary deficit calculated according to the European methodology was below the reference level of the Stability and Growth Pact, registering a level of 3% of GDP in 2018. The budgetary deficit for 2018 was above the average budgetary deficit for the euro area of 0.5 % of GDP and for EU28 0.6% of GDP.

Romania's structural deficit decreased to 2.7% of GDP in 2018, with a deficit of the general consolidated budget decreasing compared to the one in 2017, respectively 3.0%

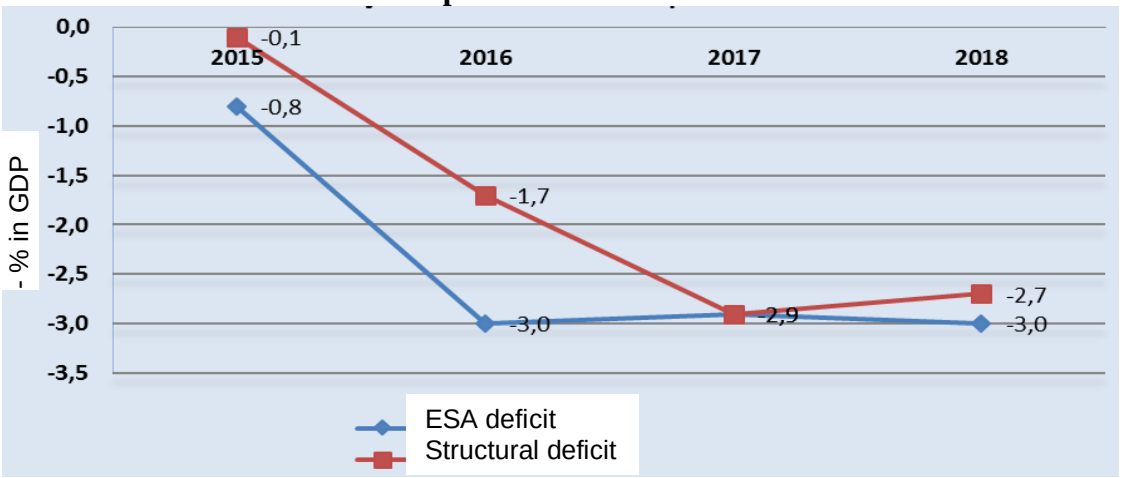
compared to 2.7% of GDP. The gap of GDP with respect to the potential (output-gap) closed in 2018, from a positive value in 2017, which led to a cyclical component of the budgetary deficit of 0% of the GDP (MPF, Raport execuţie bugetară 2017).

Figure no. 1. Structural Deficit in Romania

	2015	2016	2017	2018
Structural Deficit	-0.1	-1.7	-2.9	-2.7

Source: Ministry of Public Finance, *Raport privind execuţia bugetară finală pe anul 2018*, www.mfinante.gov.ro

Figure no. 2. The ESA deficit and the structural deficit in Romania in the period 2015-2018



Source: Ministry of Public Finance, *Raport privind execuţia bugetară finală pe anul 2018*, www.mfinante.gov.ro

In the reports issued by the National Bank of Romania, no severe systemic risks are identified, but three systemic risks are presented as being estimated at a high level: (i) the risk regarding the investors' confidence deterioration in emerging economies, (ii) the risk associated with uncertainties regarding economic evolutions in the European Union, especially those regarding the situation of sovereign debt in the euro area and the process of Brexit and (iii) the risk of non-repayment of the credits contracted by the non-governmental sector. The risk regarding the tightening of the macroeconomic balances is evaluated as having a moderate intensity, and the risk from the real estate market is at a low level (NBR, Raport stabilitate financiară 2018).

2.2. The Analysis of Revenues and Expenditures of the State Budget in 2018

According to the definitive data, the execution of the general consolidated budget, between January 1 and December 31, 2018, ended with a cash deficit of 26.9 billion lei, respectively 2.84% of GDP, under the fixed target, respectively an annual predicted deficit of 28.2 billion lei.

Compared to the previous year, the deficit of the general consolidated budget in 2018, in cash, remained at the same level as in 2017, respectively 2.84%.

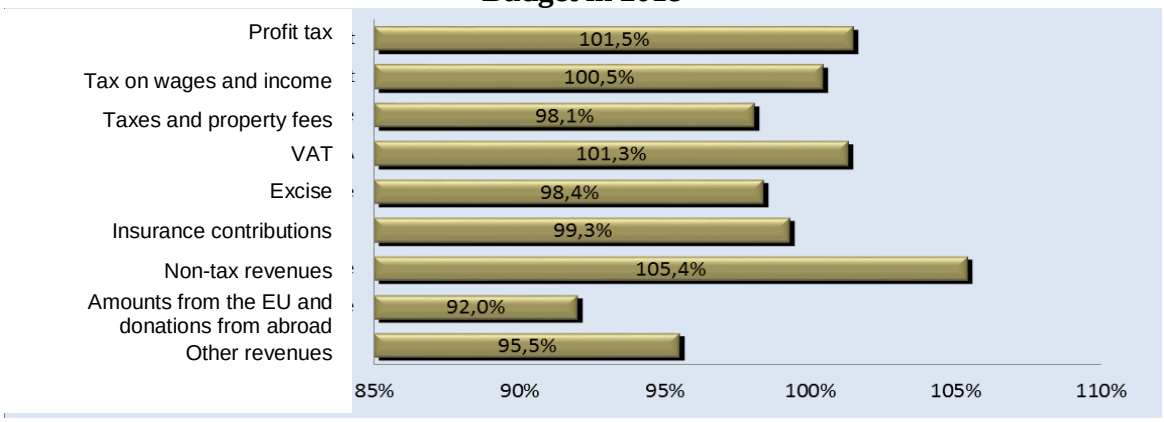
Figure no. 3. Romania's budgetary cash deficit

		2017	2018	Differences 2018 - 2017
Sold bugetar	mil. lei	-24.294,7	-26.850,3	-2.555,6
	% din P.I.B.	-2,84	-2,84	0,0

Source: Ministry of Public Finance, *Raport privind execuţia bugetară finală pe anul 2018*, www.mfinante.gov.ro

- **The revenues of the general consolidated budget**, in 2018, added up to 295.3 billion lei, representing 31.3% of GDP and a degree of achievement compared to the annual estimates of 99.5% (MPF, Raport execuţie bugetară 2018).

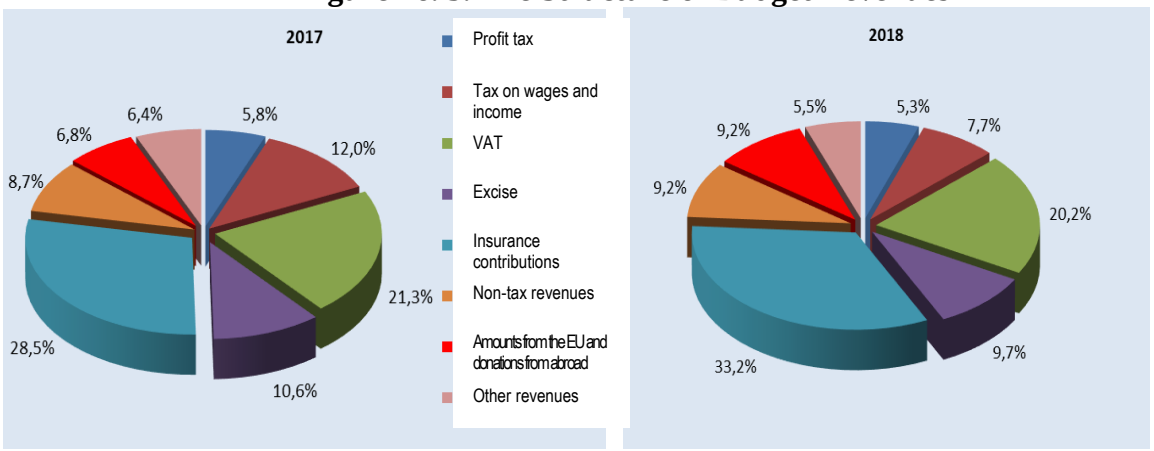
Figure no. 4. The Degree of Accomplishment of the Revenues of the General Consolidated Budget in 2018



Source: Ministry of Public Finance, *Raport privind execuţia bugetară finală pe anul 2018*, www.mfinante.gov.ro

The budgetary receipts were influenced both by the economic evolutions and the fiscal policy decisions which were adopted, such as: raising the minimum wage, reducing the income tax rate from 16% to 10%, the transfer of the tax burden of obligations regarding the social obligatory contributions owed by the employer to the employee, in the case of income from wages and assimilated to wages, the implementation of the Framework Law no. 153/2017 regarding the remuneration of the personnel paid from public funds, the increase of the pension point etc.

Figure no. 5. The Structure of Budget Revenues



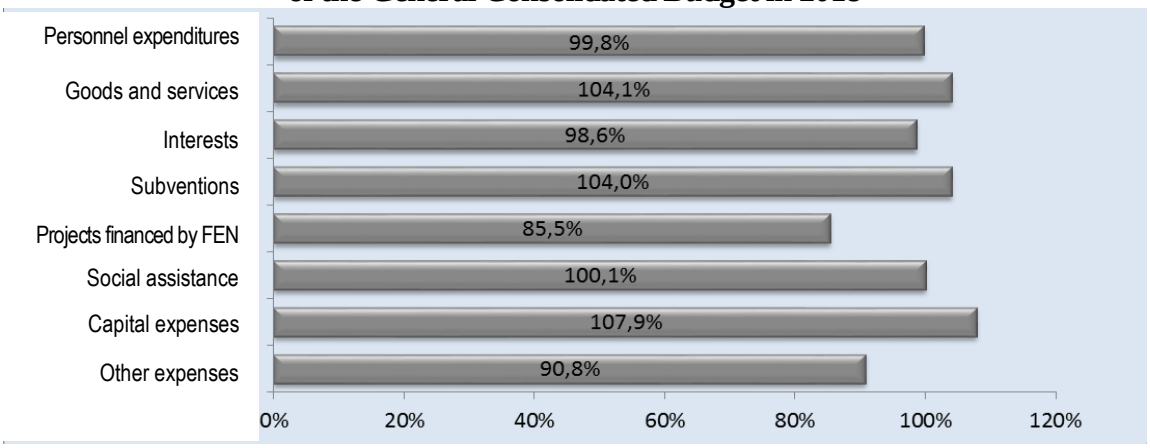
Source: Ministry of Public Finance, *Raport privind execuţia bugetară finală pe anul 2018*, www.mfinante.gov.ro

Compared to the previous year, **the revenues of the general consolidated budget**, in 2018, increased by 17.2%, and as a percentage in GDP by 1.9 percentage points, from 29.4% in 2017 to 31.3% in 2018.

The amounts received from the European Union in the account of the payments made (including donations), in 2018, amounted to 27.2 billion lei, 58.2% above the level registered in 2017. Also, as a ratio in GDP, these increased by 0.9 percentage points from 2.0% in 2017 to 2.9% in 2018.

- **The expenditures of the general consolidated budget** added up, in 2018, to 322.1 billion lei, which represents 34.1% of GDP and a degree of achievement compared to the level of 99.1%. (MPF, Raport execuţie bugetară 2018).

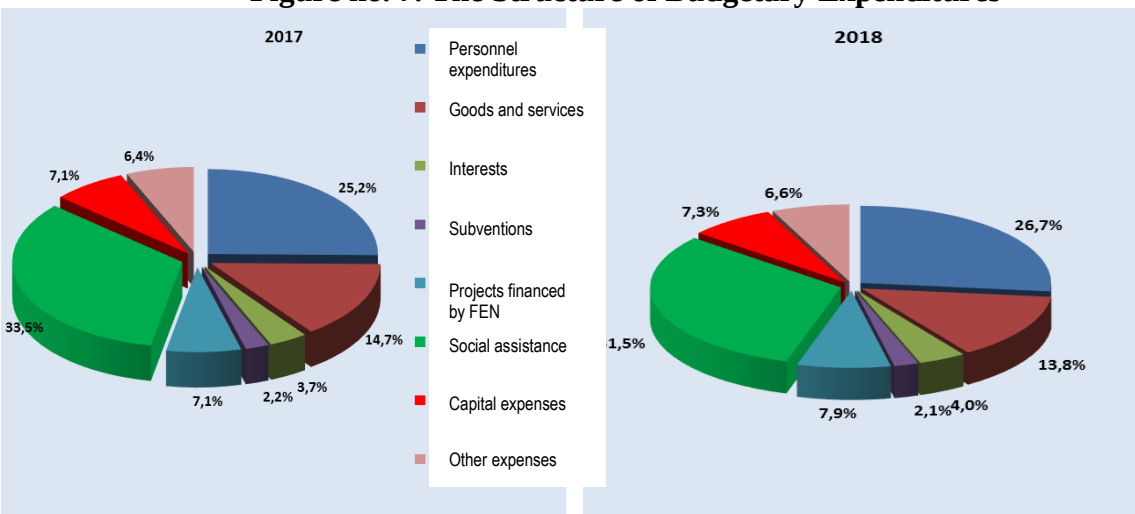
Figure no. 6. The Degree of Accomplishment of the Expenditures of the General Consolidated Budget in 2018



Source: Ministry of Public Finance, *Raport privind execuţia bugetară finală pe anul 2018*, www.mfinante.gov.ro

From the point of view of the annual program achievement degree, the main categories of budgetary expenses recorded the following evolutions: personnel expenses 99.8%, expenses with goods and services 104.1%, expenses with interests 98.6%, expenses with subsidies 104.0%, social assistance expenses 100.1%, capital expenditures 107.9%.

Figure no. 7. The Structure of Budgetary Expenditures



Source: Ministry of Public Finance, *Raport privind execuţia bugetară finală pe anul 2018*, www.mfinante.gov.ro

Compared to the previous year, the expenditures of the general consolidated budget increased by 16.6%, and as a percentage in GDP by 1.9 percentage points from 32.2% as they were in 2017 to 34.1% in 2018.

2.3. Sources of financing of the budgetary deficit in 2018

According to the EU methodology, the government debt was at December 31, 2018, at a level of 35.0% of GDP, down from the level of 35.2% of GDP, as recorded at the end of 2017, below the limit of 40% of GDP established by the Law no. 5/2017 for approving the limits of some indicators specified in the fiscal-budgetary framework for 2018. Of the government debt, as of December 31, 2018, the internal debt represented 18.3% of the GDP, and the external debt was 16.7% of the GDP .

In 2018, the budgetary deficit financing was achieved mainly from internal sources through issuances of government securities launched on the internal market and in addition from external sources. The sources needed to refinance the government debt were provided from the markets on which these debts were issued and from the financial reserve in foreign currency at the disposal of the MFP which at the end of 2018 covered approximately 4 months of the gross financing necessity.

The debt instruments used in 2018 to finance the budgetary deficit and to refinance the public debt were (MPF, Raport execuţie bugetară 2018):

- the issuances of government securities denominated in lei on the domestic market, worth 47.8 billion lei, of which: auctions of government securities on the interbank market in a total amount of approximately 45.78 billion lei and government securities for the population totaling 2 billion lei;
- euro-bonds issuances launched on foreign capital markets. In 2018, the MFP attracted from the external markets the amount of EUR 3.75 billion and USD 1.20 billion. Thus, on February 8, 2018, the total amount of EUR 2 billion was drawn through a two-tranche transaction, on June 15, 2018 the first debt repayment transaction of Romania was carried out, by issuing Euro-bonds in dollars with the maturity of 30 years, with a volume of USD 1.2 billion, and on October 11, 2018, the total amount of EUR 1.75 billion was drawn through a two-tranche transaction.

3. Forecasts on the State Budget Deficit in 2019

According to the forecast of autumn 2019, made by the Ministry of Public Finance, this was the seventh consecutive year in which the European economy was marked by growth. The labor markets remained solid and unemployment continued to fall. However, the external environment has become much less favorable, and the uncertainty has reached high levels, which has affected especially the manufacturing industry, which has also experienced structural changes. In the same document, it was expected that the gross domestic product (GDP) of the euro area will increase by 1.1% in 2019, and at EU level by 1.4% in 2019.

The persistent trade tensions between the United States and China and the high levels of political uncertainty, especially in terms of trade, have also led to a reduction in investments, in processing activities and in international trade in 2019 (MPF, Strategia fiscal-bugetară pentru perioada 2020-2022).

In Romania, the budget planning for 2019 was based on fiscal relaxation measures which began in the period 2015-2016 in order to stimulate economic growth (the new fiscal code and the salary increases and rights of a social assistance nature) and which continued through the normative acts adopted in the year 2017 through which measures in the field of remuneration of personnel from the budgetary sector were standardized, along with the

social rights field legislation, the pensions field legislation, with additional impact on personnel expenses, on those with social assistance, which were implemented in 2018, and also the fiscal measures taken during the year 2018, which influenced the macroeconomic framework and budgetary indicators in the following year.

For 2019, a potential growth of 4.7% of GDP was estimated, given the acceleration of gross fixed capital formation (MPF, Strategia fiscal-bugetară pentru perioada 2020-2022). Under these conditions, the projected budgetary revenues for 2019 should have represented 33.51% of GDP, an evolution which was determined by that of the macroeconomic indicators, and by the adopted normative acts as well, so the budgetary expenses would have been at 36.28% from GDP.

For 2019 also, a cash deficit of 4.43% of GDP was estimated, representing a significant departure from the initially set target at 2.76% of GDP. This evolution is mainly due to the commitment of some budgetary expenses based on additional revenues initially estimated that were neither materialized in the receipts, nor compensatory measures were taken, even though there have been warnings by the rating agencies and the international organisms from the first part of the year. The new budgetary deficit target also accommodates the payment of outstanding central and local public administration invoices to the business environment. In the year 2019, the structural deficit in Romania is estimated at 3.71% of GDP (MPF, Strategia fiscal-bugetară pentru perioada 2020-2022).

At the end of January 2020, the Minister of Public Finance released the situation for the year 2019 to the publicity. Thus, the budgetary deficit for 2019 was 48.3 billion lei, i.e. 4.6% of GDP, double compared to that of 2018 and the largest over the last decade. Expenditures increased by 1.7%, from 33.8% of GDP in 2018 to 35.5% of GDP in 2019 (Florentina Nițu, 2020).

How to explain this in figures?

The revenues of the general consolidated budget summed up to 321 billion lei in 2019, increasing with 8.8% compared to 2018, while expenses increased by 14.7 billion lei compared to the target of 2.76% in 2018, as the budgetary execution published by the Ministry of Finance shows. Expressed as a share of GDP, budgetary revenues registered a marginal reduction from 31% of GDP in 2018 to 30.9% of GDP in 2019. Of the total revenues, those from the income tax summed up to 17.72 billion lei, increasing by 13.2% compared to 2018, mainly as a result of the 70% advance of the profits from the corporate tax due by the commercial banks. The VAT receipts were of 65.42 billion lei, 9.7% higher than those recorded in 2018. Their share in GDP remained at 6.3% in 2019. In relation to the initial program, the revenues from this source were reduced by 4.23 billion lei, corresponding to an achievement level of 93.9%. **In other words, „the expenses are guilty! We always spend more than we plan or afford, covering the loan deficit!**"

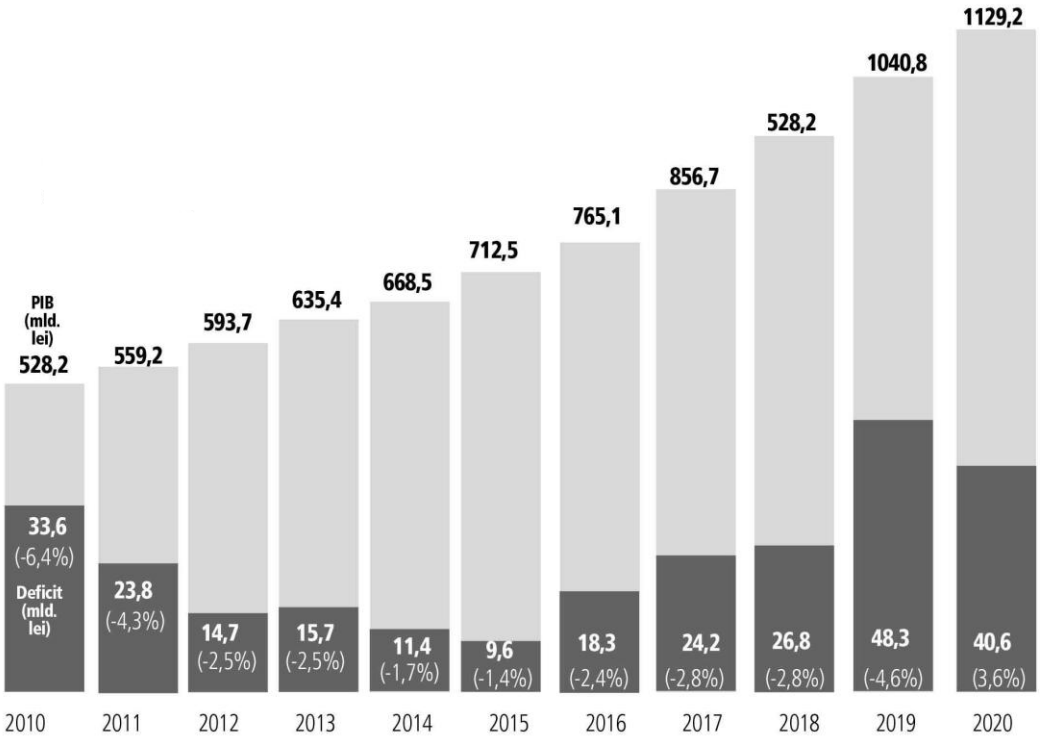
The reduction of expenses was taken into consideration every year, both in 2018 and in 2019. But along with them, a series of legislative measures were previously adopted, which put additional pressure on the budget: We exemplify some of these:

- the continuation of the implementation of the Framework Law no. 153/2017, regarding the remuneration of the staff paid from public funds;
- granting holiday vouchers in the amount of 1,450 lei for one employee;
- the minimum salary of 1,900 lei starting on January 1, 2018 has become 2080 lei starting with January 1, 2019;
- the government had to obtain 15 billion lei after the changes from September 1. 2019 which were applicable for pensions and salaries etc.

At the same time, a series of measures were kept in the budgetary construction. These measures were dealing with the budgetary expenses limitation, starting with: the compensation of the additional work only with adequate free time; the failure to grant aids

or compensatory payments on retirement; the maintenance of certain categories of rights which the military personnel, police officers and civil servants with special status in the prison administration system benefit from (this money is not part of the gross monthly balance / gross salary, as of December 2018); the blocking of the occupation of vacant jobs in the central administration; The authorizing officers of the institutions and public authorities of the central administration had the obligation to reduce the expenses with the goods and the services related to the maintenance and the good functioning of the institution, with certain exceptions, not to buy cars and furniture, etc. Although measures have been taken for the central administration, the evidence of the lack of unitary action at the level of the local administration (which has spent excessively) can be seen, on a too large number of personnel, which as a whole remains inefficient, poorly prepared and reluctant to any change that would get it out of the comfort zone. With known exceptions, which have become examples of good practice in Romania, the case of some urban and rural localities, which do not make the theme of the present study.

Figure no. 8. The Evolution of GDP and of the Budgetary Deficit in 2010-2020



Source: www.zf.ro

If we were to take into account the advice of the specialists for the increase of the revenues and the reduction of the expenses, summing up, the Top 10 of the budgetary efficiency measures would be the following (Mihnea Vasilache, 2010):

1) **Moderate inflation - the friend of Finance**. In Romania, inflation is higher than in the euro area and the EU and in the next years the difference will remain around 2-3%. This fact can be used intelligently to reduce both current expenditures, and especially the future state obligations (especially the social ones).

2) **Objective measurement of investments**. For example: A World Bank report mentioned that Romania spends 40,000 euros / km on average for periodical road maintenance, while the average in some European countries is a maximum of 9,000 euros. The difference is caused by inefficiency and corruption, difficult to determine in exact proportions.

3) **Transparency of the budget project**. The specialists believe that there are not many people in Romania who can decipher the figures presented in the budget project. Although the documents are available on the Ministry of Finance website, deciphering and interpreting them is difficult.

4) **Unitary remuneration of public servants based on performance**.

5) **Delegating and taking responsibility for expenses**. A big problem is that at the end of the year, the expenses are invariably higher than planned. To largely eliminate this discrepancy, a system of spending accountability for the different levels of government is required. Romania already has a system (of authorizing officers) that can be improved.

6) **Tax system simplification**. Five categories of taxes (VAT, excise, profit, income and social) contribute majorly to the state revenues.

7) **Fiscal amnesty**. This would allow significant amounts of money to be repatriated.

8) **Taxation of unjustifiable properties**.

9) **Making social aid more efficient**.

10) **Long-term reduction of CAS**.

4. Conclusions

The main effects of public spending can be assimilated to the „crowding out" effect, which, in this case, refers to the diversion phenomenon of market resources from those sectors that the market shows as profitable to the areas considered „of interest" by the state. Also, a hidden cost of the budgetary deficit and the public debt is represented by their influence on the country rating, an orientative indicator for investors looking for business opportunities.

Taking into account the current conditions, when Romania tries to define its role and place in the world, when it is desired to identify and encourage those branches and sub-branches of the national economy that can be developed within the world economy, it is necessary to use fiscal levers in accordance with the requirements of the European Union and taking into account the other macroeconomic policies that can be adopted to overcome the current economic situation. Thus, there is a theory that is famous and it states that it is preferable, during the crisis period, to ensure an increase of the budgetary expenditures, with the fixed objective to contribute to the revival of the economic activity, the effects being reflected in the increase of employment and in the drop of unemployment.

The model of economic growth must be reanalyzed, considering the experience of the past years in which the economic growth of our country was based on consumption, a situation that did not allow sustainable economic development. For this reason, another orientation based on investments in high value-added sectors is required.

For the first time in many years, Romania had a budget approved on time. On January 6, 2020, the budget for 2020 was enacted, after the Liberal Government took responsibility of it in the Parliament. The budget project for 2020 is built on an economic growth of 4.1%, a budget deficit of 3.59% and an average inflation rate of 3.1%, according to the Report on the macroeconomic situation for 2020 and its projection on 2021-2023 (www.economica.net, 2019).

But for the first time ever, the global economic and social situation, caused by the coronavirus pandemic, is unique! Forecasts are made, calculations are redone, but there are no comparison terms! Even more now that we can clearly see the dependence of the whole world on a single country: China.

What will this look like at the end of 2020, as humanity faces the coronavirus pandemic? It is something that we will find out at some point!

But the lesson learned seems to be that globalization is not the best solution, that the states of the world must rely more on their own forces! And so does Romania, even if it is part of the European Union and it resonates with Europe. The irony is that Romania currently has a liberal government. This has to prove the economic doctrine „Through Our Own Forces!", promoted by the National Liberal Party through Vintilă I.C. Brătianu in the first half of the 20th century.

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THEORETICAL CONSIDERATIONS ON THE CONSUMPTION-BASED ECONOMIC GROWTH

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Abstract: *The paper aims to analyse, from a critical point of view, the standard models of economic growth which are based on the consumption as command variable within a post-keynesian economy. To this end, firstly, the study identifies the theoretical macroeconomic variables which can stay as proxies for consumption (for example, the wage), extracting the pros and cons arguments for every of them. Finally, the paper provides a set of arguments in favour of considering the consumption as an appropriate macroeconomic variable to model the economic growth, especially in the post-pandemic COVID-19 period, based, of course, on taking into account the economic sustainability on medium and long term.*

Keywords*: economy, consumption, growth, sustainability.*
JEL Classification*: E20, O11, P24.*

1. Preamble

Any economic theory, no matter its ideological background, aspires to clarify three basic elements: a) which are command variables, that is, those variables which, once triggered, causally generates the desired variation of the target variables; b) which are the target variables, that is, those variables whose variation is intended; c) the economic (and institutional mechanism) by which the command variables influence the target ones. The economic theories originated in the Keynesian philosophy presuppose the macroeconomic command variables are related to the real economy and causally act on the macroeconomic variables which are related to the nominal economy. In the present paper we'll situate within the post-keynesian economic theory in order to examine the consumption-based assumptions on the economic growth (Madrick, 2012).

2. On the final purpose of the economic activity

The economic activity is generated by the existential pressure, that is by the pressure exerted from the biological needs perspective (in more pedant terms, we'll talk here about the necessity of entropic exchange between individuals and the non-anthropic environment). In fact, in the beginning of the human society, when the resources were free because the biological needs were exceeded by the resources (that is, those resources were not scarce), the economic "activity" did not exist in the current meaning (in fact, today, the animals take almost freely the needed resources from the environment). So, in a general way, the economic activity is a social organized activity aimed at to procure the resources capable to sustain the life of the individuals and of the communities. In essence, this purpose remained (and, in my opinion, will perpetually remain) valid.

3. Economic activity sophistication

The direct consumption purpose of the economic activity is detectable, however, at the dawn of the human civilization only. As much as this civilization has developed, such a purpose became increasingly difficult to be viewed and understood. More and more fetishes arisen, more and more structural rings were been added in the economic activity chain (remember the scientific work of Marx to get, under the merchandise veil (fetish), the key of what he called the labour exploitation; remember, more recent, the scientific work of Minsky to get, under the financial structure of the modern society, the key of what was called then the Minsky momentum aiming to initiate financial crises and so on). Let's

logically examine the process of the economic activity sophistication and extract the causalities involved.

In the economic history can be observed three praxiologic paradigms which governed the economic activity: a) the *stationarity paradigm* – the economic activity is directly targeted to get the resources aimed at to satisfy the biological needs of life; b) the *optimality paradigm* – aimed at to extremize the result of the economic activity beyond the strict biological and social needs; c) the *sustainability paradigm* – aimed at to get the economic resources needed ensuring at the same time, the replication of that economic resources in an inter-generational perspective. With that, the economic activity suffered a permanent departure from its genuine purpose – i.e. satisfying the biological needs of life. Figure 1 tries to show such a process which led us, until today, to the current economic activity whose link with the initial economic purpose is almost unobservable.

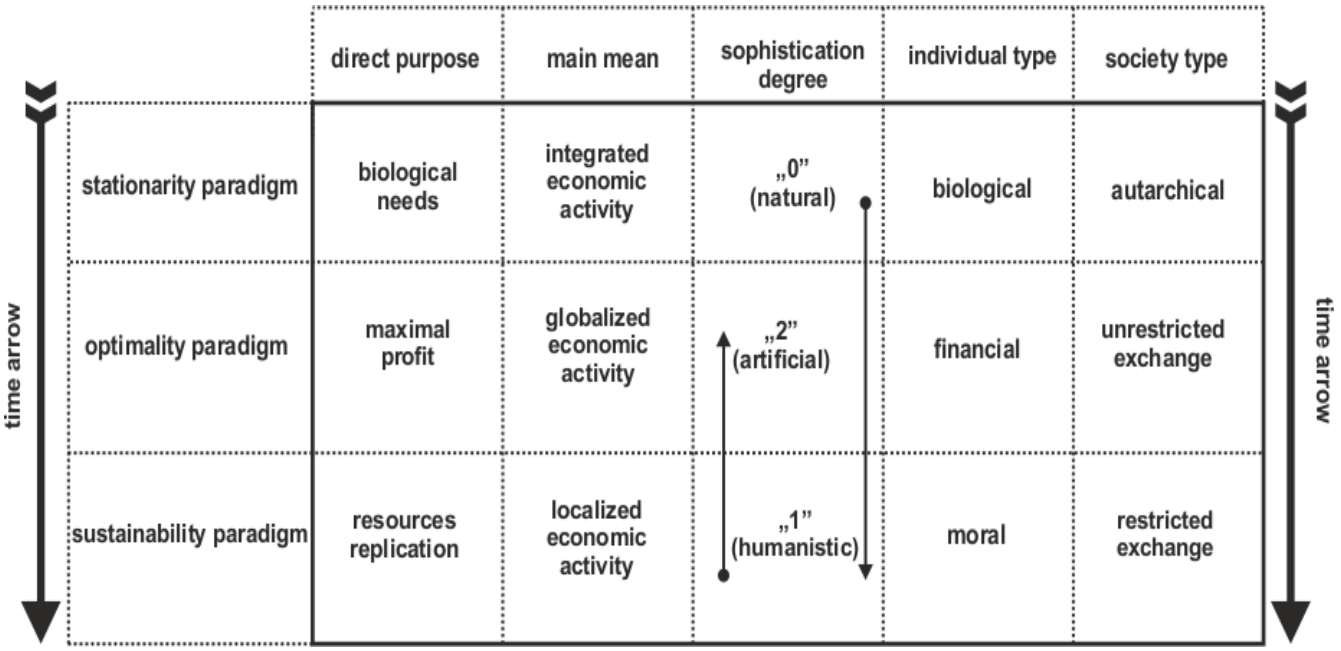

Figure 1. Historical evolution of the economic (praxiological) paradigms.
Source: author.

4. Relationships between command variables and target variables

Logically, a command variable is the cause for the target variable, which is the effect. The way by which the cause generated the effect may be modelled functionally: $t = f(c)$, where with t is noted the target variable, and with c is noted the causal variable. With f is noted a function (or functional, in the case in which c is, in turn, a function itself) or a mathematical operator (or transformer) which transforms c into t. Of course, the analytical form of f is important but, for the purposes of present paper, it is not. Generally, but even more in the economic field, the relationship between command variable and target variable is not unidirectional, that is there is also a relationship between target variable and command variable. Some considerations could be here of usefulness:

- in the most cases, the bi-directionality of the causes and effects are of feedbacks nature (either negative or positive feedbacks). So, the „role" of cause or effect is „played" successively, but not concomitantly, by the c variables, and t variables,

  respectively. It is important to draw attention here that the feedbacks act only related to the same system, not related to different systems (NB: to capture

feedbacks from different system one should put together those systems – in a way – so getting a unique system);

- there are too the possibility the reciprocity between the two „roles" – of cause, and of effect – act simultaneously. This case is a complicated one, because it lead us to the concept of co-evolution (or, what is the same, of circular causality – do not confuse the circular causality, which happens simultaneously, with the feedbacked causality, which happens successively);
- from a logical point o view, especially when we have not to do with irreversible process (as in the economic field we do), the cause and the effect are equivalent, in the senses that if we know the cause (c) and the function (al) f, we can get the effect t ($t = f(c)$), but also, if we know the effect t and the function (al) f, we can get the cause c: $c = f^{-1}(t)$, of course with the mathematical condition that f be bijective.

5. What is a consumption-based model of economic growth?

The post-keynesian economic theory assumes as axiom that the command variables in the economic process are of demand-side type. This means, in the economic process, if we want change something regarding the behaviour of consumers, producers, investors and so on, the condition is to change one of the demand-side variables. As it is well known the aggregate demand in the economy has four components: a) the consumption (both private and of the government); b) the investments (both private and of the government); c) the net export (that is, the difference between the export of goods and services and the import of goods and services); d) the variation of stocks. So, a consumption-based model of economic growth implies that the command variable of such a model is the consumption. Usually, since the government consumption (that is, government acquisitions of goods and services aimed at to support the administrative activity of the government) is very small compared with the private consumption, in the economic models of consumption-based logic is used the private consumption. The private consumption is generally composed by: 1) final consumption of households; 2) final consumption of the non-financial firms; 3) final consumption of the financial firms; 4) final consumption of the non-governmental organizations. So, the consumption-based models of economic growth constitute a species of the demand-based models of economic growth. To be observed that the consumption is a component of GDP, after the expenditures method of calculation. So, the logic presupposition in such models is the following: increasing of the consumption (that is, increasing of the demand) will generate an increase of the supply (for example, through an increase of the average price, and as a result, GDP increases (of course, an increase of the average price is possible only because the supply cannot react immediately to the increase of the demand and so, for a while, the average price will increase. But an increasing of the average price will stimulate the producers (and the investors too) to produce (or invest) more because the profit will be more at a larger scale of production. The simplified logic of the consumption-based model of economic growth can be represented as in Figure 2.

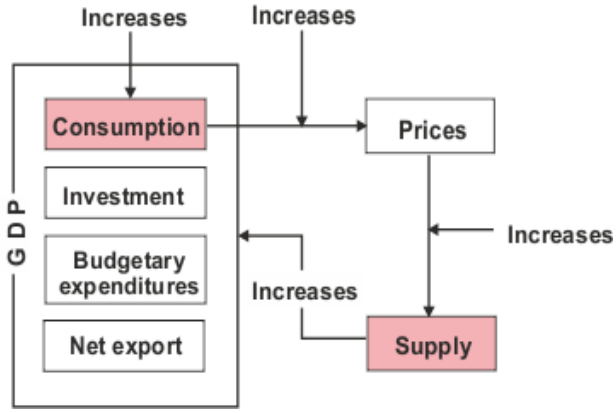

Figure 2. Positive feedback mechanism between GDP and consumption.
Source: author

6. Practical construction of the consumption-based model of economic growth

The idea is to find the economic variable which is the most controllable by the government (that is, by the public policy) and which ensure the consumption-based driving of the economic growth. As the households' consumption component of the final private consumption is the most important quantitatively, the usual model of such a category is the WLG (Wage-Led-Growth) model (Lavoie & Stockhammer, 2013). This principled means the followings:

- the strongest variable driving the consumption is the disposable income (that is, the personal income from which the direct taxes are subtracted);
- the largest component of the disposable income (Onaran & Obst, 2016) is the net wage (that is, the gross wage from which the direct taxes on wage is subtracted – that is, the social contributions and, from the remained wage, the tax on the wage);
- the net wage (that is, the disposable wage) is used for two and only two destinations: a) for consumption; b) for saving (no matter the way of such a saving – at banking deposits, or in own pockets);
- the shares of the two destinations is established by a behaviour parameter, called propensity to consumption, either as average ($apc = C/DW$, where apc is the average propensity to consumption, C is the monetary value of consumption, DW is the monetary value of the disposable wage), or as marginal ($mpc = \Delta C/\Delta DW$, where mpc is the marginal propensity to consumption, ΔC is the variation/change of the monetary value of consumption, ΔDW is the variation/change of the monetary value of the disposable wage); NB: obviously, the propensity to saving (either average or marginal) is the difference towards 1 of the propensity to consumption;

So, given the gross wage, the legal coefficients for social contributions, the legal rate of tax on wage, and the coefficient of the propensity to consumption, we know about the monetary assets which will be used to demand goods and services. Based on such information and using the demand and supply curves in the economy, we can establish the

price increasing (of course, under the hypothesis that the supply cannot react immediately to the increasing of price but with a given lag) which will drive the DGP increasing, as in Figure 3.

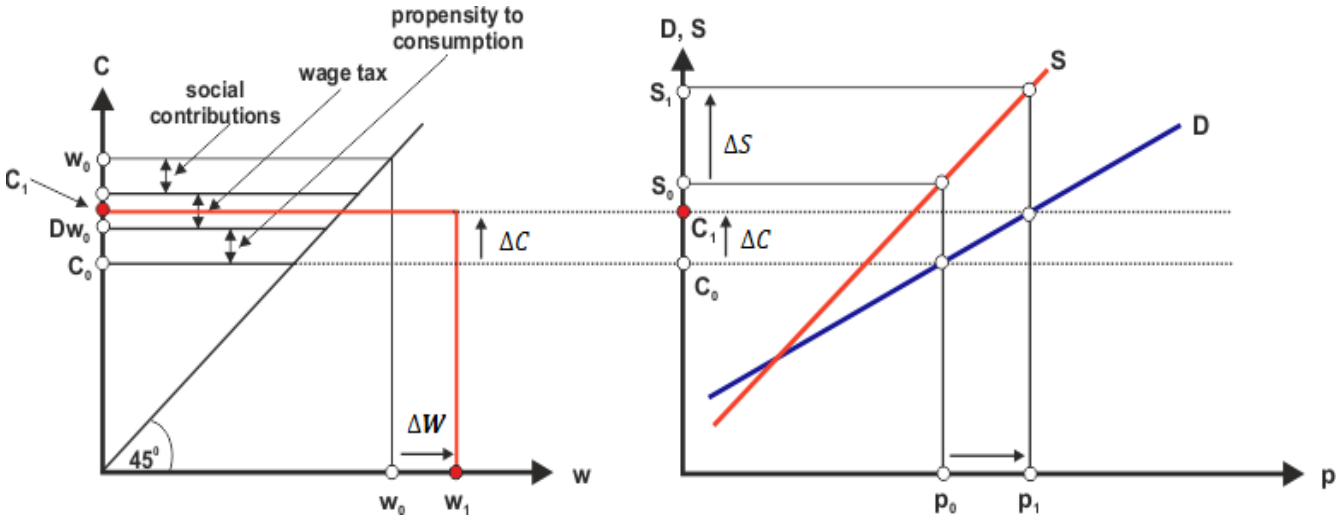

Figure 3. The mechanism of WLG model of economic growth.

Source: author

7. Critical analysis of WLG model

7.1. How can the government increase the wage?

First of all, it must be explained why the wage is selected as variable expected to drive the economic growth through the consumption. In fact, the government can conduct the wage level in the budgetary sector only (and in the state private domain, of course), so in a small part of the employed population. There are at least two ways by which, however, a legal possibility to change the wage level in the private sector too stay at the government disposal:

(a)by intermediation of the minimal wage value

The minimal wage is that monetary level of the gross wage under which no employer can pay someone. Once a level of the minimal wage is established by law, it results all the wages in the economy will increase at least with the increase of the minimal wage. So, the government get an increase of the wage according the WLG (Disoska, & Toshevska-Trpcevsk,, 2016) model of economic growth;

(b)by intermediation of the wage taxation

As shown above, the consumption is reduced compared with the gross wage through three ways (social contributions taxation, personal income taxation, and the propensity to consumption). The propensity to consumption of the disposal wage the government has not a direct influence, but on the two categories of direct taxation, by the contrary, it does. It result that, by reducing one or both of the involved rates of wage taxation, government can increase the net wage and this way can increase the consumption.

In both cases examined here, the government intervention in the economy is discretionary. Although there are situations in which such interventions cannot be than discretionary, the free decentralised market must be avoided from this type of interventions. So, some automatic stabilizers (or, if the case, distabilizers) should be designed and implemented in order to drive the wage evolution so the WLG models work. In the final of the paper, some suggestions in this matter will be provided.

7.2. Some adverse effects of wage increasing related to WLG model

Figures 2 and 3 show how a wage increasing leads to economic growth, using the accepted economic theory (more exactly, the demand-side economic theory). However, the additional wage, and, consequently, the additional demand for consumption could manifest some adverse effects which compromise the expectations regarding the WLG (Lavoie & Stockhammer, 2012) model efficacy. Let's examine two (most probable) of them.

(1)increasing the propensity to saving when net wage increases

When the net wage (i.e. the disposable wage) increases, someone could find here a chance to increase not his/her consumption, but his/her saving. Such a motivation can arise from many reasons: a) s/he doesn't need to consume more from luxury goods and services, while the consumption from staple goods and services is anyway capped. Of course, such a case implies that the „law" of marginal propensity to consumption be violated, that is, as the disposable wage increases, the marginal propensity to consumption decreases; b) s/he is cautious and take measures to save the additional net wage for times to come, for the eventuality when the wage could be reduced. So, such adverse effect consists in the fact that as the net wage increases, the propensity to saving increases too.

(2)directing the additional net wage to external supply (import)

This time, the propensity to consumption doesn't decrease as the disposable wage increases, but the additional demand for consumption is not directed to the internal supply, but to the external one (that is, to import). As Figure 2 shows, the import is subtracted from the value of GDP, so GDP decreases as import increases. This means the increasing of the disposable wage do not lead the economic system to grow, but by contrary. Such an adverse effect always happens when the economies are open, but the contemporary economies are all open.

(3) autonomizing the wage kinematics from its economic foundations

The wage is the monetary expression of the marginal labour productivity. If the governmental interest is to increase the gross wage in order to push on the economic growth without correlating the increase with the increase of the marginal labour productivity, it is possible the wage increase become unsustainable. Of course, the government could increase the gross wage in the model of efficient wage (the concept of efficient wage means: paying to someone more than its marginal labour productivity will incite him/her to increase the productivity so to maintain the new level of the wage), but, even so, there is the risk to introduce unsustainability factors on the labour market.

8. About automatic devices in WLG models

In order to avoid the discretionary intervention of the state (government) in the economy to generate an increase of the disposable wage, automatic devices could be designed and implemented (of course, in a …discretionary way) so such an increase (or decrease, after the case) occurs automatically. In the followings, some suggestions will be made. The suggestions will address punctually the two ways in which, discretionarily, the government changes the disposal wage.

(a)on the minimal wage

Establishing of the new level of the minimal wage must be removed from the government's aegis (or, after the case, from mix committees – government, employees' representatives, and employers' representatives) and linked to a macroeconomic variable which ensures the sustainability of the wage increase. As discussed above, such a macroeconomic anchor to sustain economically the gross wage increase can be the average productivity calculated based on gross added value and on average number of employees. An algorithm could be introduced by law so, any increasing of the average labour

productivity lead to increase the minimal gross wage at most with the index of average labour productivity.

(b) on the wage taxation

Using the wage taxation also allows designing and implementing of an automatic device. We'll briefly describe such a device:

- a grid regarding the average propensity to consumption, at national level will be introduced, so allocating a rate of wage taxation (either globally – that is, including the social contributions and the wage tax – or separately, for the social contributions and the wage tax) for any interval of average propensity to consumption variation;
- the grid will allocate progressively the rates of wage taxation to values of average propensity to consumption;
- so, whenever the average propensity to consumption decreases, the wage rate of taxation will decrease too, so more disposable wage remains to individuals, hoping the average propensity to consumption so will increase;
- to be mentioned that the automatic device will act only if a decreasing of the average propensity to consumption occurs, but not in the opposite case.

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THEORETICAL PERSPECTIVES OF THE RISK MANAGEMENT APPROACHES IN SCHOOL ORGANIZATIONS

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Abstract: *The challenges imposed by the dynamics of today's society and the change of educational paradigms in the last two decades require at the level of school organizations a rethinking of managerial strategies from the perspective of managing the identified risks. Risk management is an essential condition for the effective management of a school organization. The school manager has the task to combine the tactics and the strategy, to have a holistic view on all the causes that can in a way affect the health of the school organization. The purpose of this paper is to highlight the importance of the manager, the managerial style approached, his personal profile in order to obtain the best risk management in the school organization. This paper is based on a rigorous analysis of the literature, scientific documents that regulate and define risk management from the perspective of the manager's personal approach.*

Keywords: *personal skills, internal managerial control, risk management, school manager, school organization.*

JEL classifications*: I21, G32, O15.*

1. Introduction

In school organizations, risk management is extremely important and the institution's manager needs to have a comprehensive approach to risk management that allows the organization to consider the potential impact of different types of risk on processes, activities, operators, products and services. It is not surprising that, in a social realm, regarding children and their future, play has an important role in education and at the same time represents a risk. The number of applications has risen sharply against educators, teachers, and education authorities have been a boost to government interest, with emphasis on mandatory risk oversight and control. This report presents different perspectives on risk. In addition to the obvious remarks about the main risks, a less common discussion of how principals may be at risk refers to the indisputable issues that accentuate risk in education. The possibilities for risk in practice are also increasing. This paper exposes inherent, contradictory and problematic aspects, so-called risk aversion practices, to inform research on both risk and school management.

2. Risk management in school organizations. Theoretical perspectives

Twenty years ago, in some school organizations, risk considerations were different, while facing the school manager. Risk is a word we all use, but we interpret it differently. The risk may not be visibly tangible, but it is always present in every action, effort, and function that an organization can perform (Roughton, 2019).

Now, in school organizations, risk is the responsibility of everyone, but especially of school managers and department heads. All risk procedures have become mandatory, everyone joins the procedures that they cannot ignore. In addition, there is the aggressive parent, showing harassment with disrespect, who do not comply with the regulations and do not respect the law, who deals with the disloyalty of staff , which Barth (2007) says is

always accompanied by risk and involves managing critical incidents, rendering the main negligents, those who do not follow the procedures.

Occupational safety and child safety are the primary risk factors, with negative consequences. School managers work in different periods with great obligations and high monitoring. In some circumstances, it is difficult for the school manager to make any move without extending the consultations and counselors, for fear of the concomitant risks they might inadvertently cause. Risk management requires an increasing amount of energy and time.

In recent decades, the direction of guidance and control has changed irrevocably and continues to evolve. For example: the nature of the work, the working hours, the working conditions, the working tools, the expectations and the responsibilities are different. School managers feel more and more stressed as the tasks they receive are more complex, becoming demanding and time-consuming tasks.

As a result, school organizations suffered, affecting the time available for children, classrooms and curriculum. School managers are responsible not only for the money they contribute to the education system, but also for diminishing the problems that pose a threat to the educational process of the students. Successful educational organizations will be the ones that benefit from professional managers in identifying and controlling most of the risks that are unique to school systems. Most schools place this responsibility on the shoulders of the school manager or on the shoulders of the financial administrator who may not have the experience of identifying all the risks. School risk managers are responsible for a wide range of issues, as well as benefits such as healthcare, unemployment, environmental safety, etc. At the level of the organization, there must be a risk analysis form identified in the compartments: management, didactic, administrative and financial accounting, in which the objectives of the activity are specified, the identified risks, and the person in charge of risk management will centralize the inherent risks.

Starting from the definition given by (COSO) of the risk management system, this is a process implemented by the personnel of an entity, exploited to develop the strategy. Risk management is an essential part of the task related to the internal management control system. The main expected effects within an entity, regarding the objectives of an internal control system and risk management, are to identify the potential events that may affect the achievement of the objectives, positive if it is appropriate and negative, if there are risks. The public entity's risk portfolio, to control the risks according to the level of each risk in order to increase its value. For a proper risk management we must allow the management to make informed decisions, in accordance with the risk for an efficient monitoring of the internal control and risk management systems according to their severity, to which they are exposed, and to plan the actions to be taken in case of risk (D ans l'ensemble du document, la dénomination « conseil » se rapporte au conseil d'administration ou au).

The aim was to provide reasonable assurance regarding the achievement of the entity's objectives. As we are integrated in the risk management activity, in the control mechanisms we must follow, more precisely to ensure:

- Compliance with laws and regulations;
- Application of instructions and guidelines established by management;
- The good functioning of the internal processes of the institution, especially those that contribute to the protection of the goods;
- Reliability of financial information.

According to the IFA ideological guide (LE suivi de l'efficacité des systèmes de contrôle interne et de gestion des risques, 2010), a system is effective as long as it meets the objectives for which it was implemented. Thus, the risk management system and the internal control process must operate in a coordinated manner to achieve the risk

management assigned to them. The efficiency of the internal control and of the risk management system goes through the good coordination of the activities: risk assessment regarding the evaluation of the control activities, remediation plans, management and dissemination of information in order to ensure a continuous supervision. Therefore, the whole system must be adapted to the characteristics of each entity. After the 15 practices were implemented, the effectiveness of the system could be ensured:

1. The risk defined by the department heads;
2. Responsibility for risk management;
3. Identifying events that could have an impact;
4. Analysis of negative events that may generate risks;
5. Risk assessment and their potential impact;
6. Development of risk responses;
7. Residual risk analysis in relation to acceptable risk levels as defined by management;
8. Implementation of activities in each organizational process;
9. Evaluation / self-evaluation of the control activities;
10. The control activities are supervised by the supervisory functions;
11. Submitting the evaluation of the control activities to an independent analysis;
12. Define and monitor the key performance indicators related to the risk management system;
13. Submission of remedial plans for a documentary follow-up;
14. Identification and analysis of proven incidents;
15. Periodic updating of system objectives and strategy.

3. The school manager - responsible for risk management

In the educational management, an important role is played by the profile of the one who holds the leading position. The quality of the specific actions depends to a large extent on the manager's abilities and on his qualities to handle critical situations. To address this topic, I will start from identifying the defining elements of an educational manager through a critical analysis of specialized sources. The topic addressed is a current one at the level of the international educational systems, each educational organization following the managerial performance.

With the development of the private education market, the management aspects become more and more important, realizing the need to adapt the services offered to the market. This analysis is also necessary in view of the specifics of rural schools. Given the fact that the values, principles and methods of educational management penetrate with great difficulty, it is necessary to provide materials from which the staff of these units to find edifying elements.

The conceptual delimitation of the term manager refers to the specialized theoretical considerations, "if management is the science of management, then the manager is that type of leader who not only executes as he is told, but acts in such a way as to obtain very good results, accordingly. with the proposed objectives and adapting to new realities. The manager identifies solutions for achieving the proposed objectives, making them aware and motivating the members of his team in the same direction" (Niculescu, 2010). When we refer to the manager, in the context of educational management, "this is one of the key factors in introducing any educational changes. Without competent managers, prepared and able to decide quickly and efficiently in the most varied conditions, the educational reform will fail. In the context of managerial activity defined as the art of making things happen in organizations through others, it is the manager who procures, allocates and uses physical and human resources to achieve the goals set" (Niculescu,

2010). It is necessary to emphasize that the position of director is constantly evolving, adapting to the different social and educational contexts.

In order to create a picture of the educational manager, it was assumed that certain specific characteristics of the educational manager could be identified, which would recommend him to be able to perform a managerial function. In support of this statement, the educational management expert Niculescu M. emphasizes that "the profession of educational director / manager implies a certain human material, a personal commitment, signifying managerial functions that require an important development of human qualities and a leadership through complex competences" (Niculescu, 2010). Regarding the qualities of the managers (Figure 1), their scale, developed especially in the 50s - 60s, tried to explain the organizational efficiency through the personal qualities of the managers (Cojocaru, 2006).

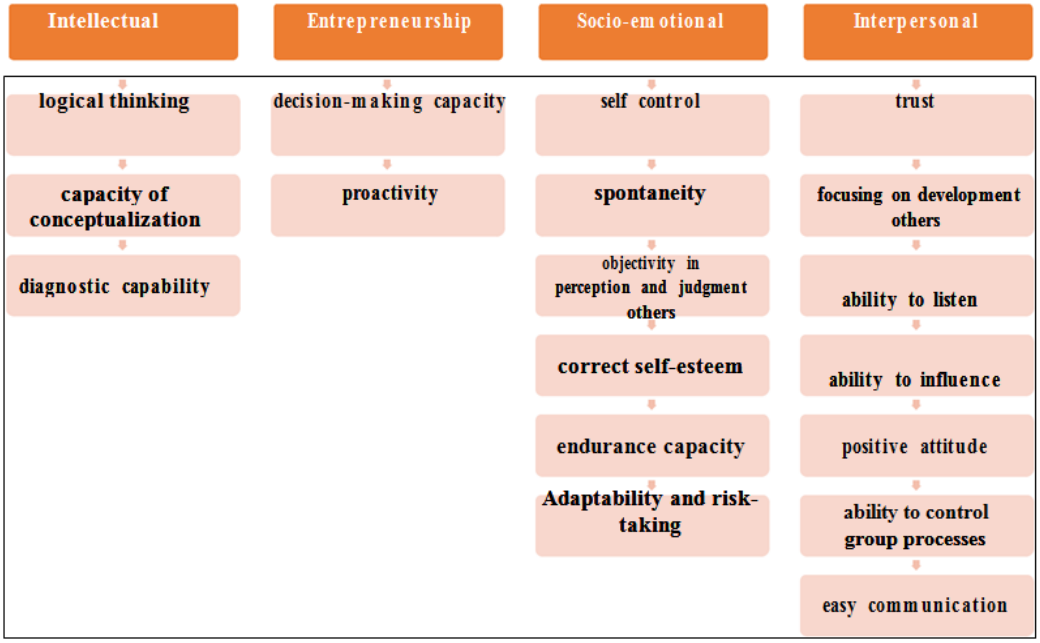

Figure 1. Personal qualities of managers

Source: adapted by Cojocaru, (2006)

To complete the list of qualities that should characterize an educational manager, Stogdill (1974) considers that an effective manager is characterized by a high level of responsibility, vigor, consistency in achieving goals, creativity in problem solving, initiative, self-confidence, accepting the consequences, taking decisions and the ability to influence others.

4. The importance of the school manager's profile in implementing risk management

Employee trust in the school manager managing risk plays a significant role in controlling disaster damage (Wachinger, 2013). If the school manager takes the risk, trusts the decisions he makes, the followers follow his actions and help the organization to cope with the risks and try together to reduce the effects of the risks.

Risk taking should be a common thing for the school manager. This risk-taking will help lead the school organization to success. Taking a risk could make school managers less courageous to take the initiative. The ability to take risk is a beneficial thing for a school organization, when managers are well informed. The school manager must, in conditions of extraordinary strain of will, in moments of danger, be able to operatively

adopt optimal decisions. Sometimes success depends on decisions made in minutes or seconds.

Also, in order to be able to identify the risks, in order for the school manager to manage them later, he needs a series of skills through which he can create a managerial trajectory to follow in the risk management (Figure 2).

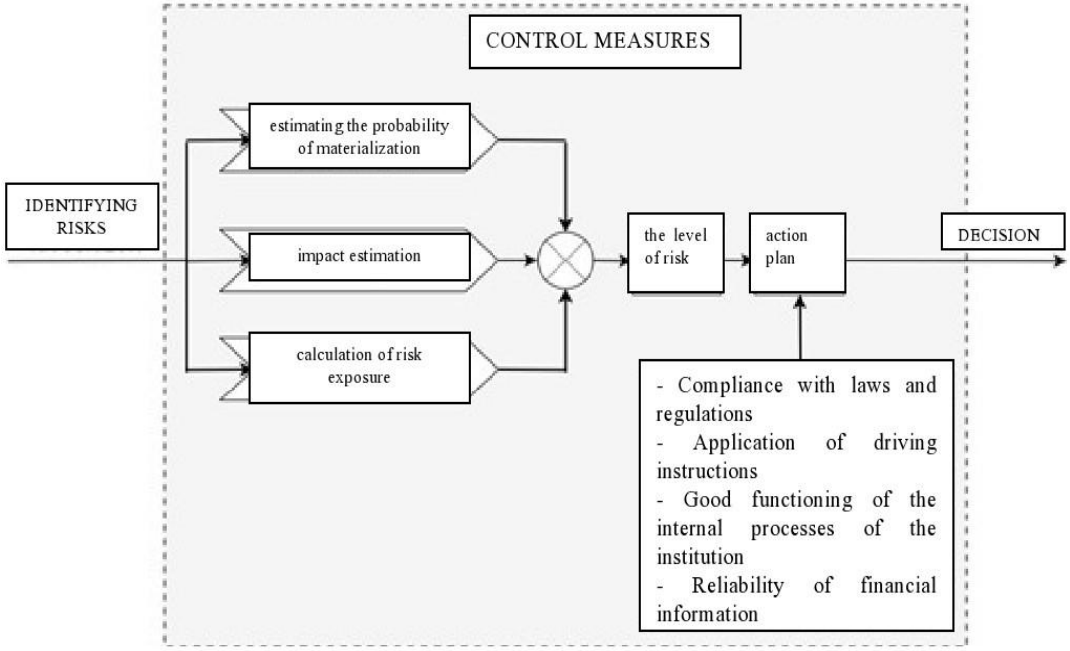

Figure 2. The managerial trajectory to be followed in risk management
Source: made by the authors.

Initially, the school manager will have to identify the risks, determine the level of risk, propose an action plan and make a decision. The decision of a risk manager to share a common fate regarding disaster risk exposure means that he risks the same values as his employees. When followers see such actions, they will realize that the risk manager shares the same values in the same situation with them, causing them to evaluate him as trustworthy. Moreover, volunteering in the actions of risk managers will function as a signal of high confidence (Nakayachi, 2014). Risk perception studies have examined various determinants of trust, for example, perceived competence, integrity, fairness, transparency, objectivity and honesty of the trustee have been examined as potential determinants of trust (Johnson, 1999).

The level of risk consists of the impact it has, the exposure to risk and the probability it has. We must also keep in mind that the action plan must be in accordance with laws and regulations, driving instructions, etc. The process of updating and evaluating the objectives and activities will be coordinated by the Monitoring Commission, at the level of each public entity.

Depending on the size of the organization, the types and complexity of activities, each school organization will adapt its own procedure system, which describes in detail how to develop, endorse, verify, record, approve, disseminate and archive procedures, according to law.

5. Conclusion

Effective risk management consists of understanding the risks we face and which must be prevented or reduced, so that we can reach a final result. Now more than ever,

schools need to use risk management to generate short-term and long-term loss planning that affects the institution's budget. School organizations increasingly understand the importance of successful risk management, as each risk can be viewed as both a threat and an opportunity. In order to control the risks as efficiently as possible, the risk management process implies that the manager of the school organization has creativity in problem solving, initiative, self-confidence, accepting consequences, taking decisions and being able to influence employees to follow the decisions made by this. Through the pro-active attitude towards risk of the manager, risk management and by streamlining the decision in risk analysis, the school organization can become more competitive from the perspective of several important areas of interest: activities, processes, actions and strategies.

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POSSIBILITIES OF EVALUATION OF THE EXPENDITURE OF THE CLOTHING INDUSTRY BY THE MONTE CARLO METHOD

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Abstract: *The analysis of the possibilities by which the expenses can be measured in the clothing industry in Romania, is the starting point of this research. We consider it useful to know the ways of measuring the expenses at the level of companies, in order to obtain a greater profit, by using as little resources as possible. The results of the empirical study are satisfactory, in the sense that through the safety interval of the average of the expenses, it is possible at any time to check the state of the company's performance. Therefore, according to the results of the proposed model, the company that is the subject of the case study should find solutions to reduce the operating and financial expenses existing in 2017.*

Key Words: *Monte Carlo method, expenses, probability distribution, random variable, clothing industry, scenario.*

JEL classification: *C63, D24, L67.*

1. Introduction

The clothing industry in Romania has a tradition of over 100 years, which has been forced with the passage of time to adapt to the various requirements coming from customers for lohn production as well as for mass production. In addition, the technologization of the activities carried out were necessary in order to help the efficiency of the production activities and the efficient management of the operating costs.

We believe that the garment industry, as an important branch of the national economy, contributes to ensuring sustainability in Romania, because sustainable development cooperates with economic development. In the years of communism Romania was internationally recognized for its garments and is still present but on a much smaller scale, as statistics show, where it is observed that at present - in 2019, there are 3,814 active companies that have as their object of activity - Manufacture of clothing (www.topfirme.com). In order for this industry to become what it used to be in the years of communism, we believe the need to use the existing resources towards some more advanced ones to attract external customers.

The challenges arising in the clothing industry in Romania and the European Union after 2000 are multiple, due to the impact of more and more existing companies as a result of two priority factors: the global economic crisis and the migration of lohn from the western European countries and even from Romania, towards the Eastern European or even the Asian countries where the labor force is vast and cheap. We consider that these two factors determined consequences that led the companies in the clothing industry to losses both from the perspective of the production made and the marketing of products, even more some of the companies reached the threshold of bankruptcy.

The expenses, according to Nicolae Todea (2002, p. 348) represent from a financial perspective any payment made to third parties for the purchase of the production factors, which can effectively become a component of the cost only when the production factors are consumed, the costs quantifying the relationship between the expenses and the results obtained, which can be materialized in products, works, services.

The two components of accounting - financial and management, highlight the expenses in their own way, taking into account the accounting records, which is the most important source of data for economic analysis. The total expenses found in the Company's Income Statement include both Financial expenses and Operational expenses that have the

following components: Expenditure on raw materials and consumables, expenses on works and services performed by third parties, personnel expenses, Other operational expenses (Camelia Burja, 2009, p. 91).

We believe that the need to reduce expenses in a company is a necessary measure in order to increase the profit to the same volume of activity. At the same time, it is necessary to take into account an important aspect in the analysis of the reduction of costs, that is, not to go up to the threshold of their sub-reduction, because in this way it will create a malfunction in the production process, which could have adverse consequences in the form of losses, which would be even more important than the economy that could be made by reducing expenses.

2. Literature Review

The Monte Carlo method is closely related to the problems of probability and value theory, as Paul Glasserman (2003, p. 1) points out. This method is distinguished by simplicity, the generality it proves and is based on the law of large numbers for independent random variables.

The idea of calculating by Monte Carlo method according to László Pokoradi (2016, p. 44) is older than the calculator, which has a history that has been noted since the last century, when numerical calculations were made using pencil and paper.

The name of the Monte Carlo method, however, is relatively recent since 1949 and was invented by Nicolas Metropolis. The Romanian researchers Ion Dobre and Floare Mustaţă-Horpos specify that the Monte Carlo method is known in the specialized literature and under the name of "the method of equivalent tests," the method of statistical experiments "," the method of indirect simulation "," the method of numerical simulation "," the method random numbers "," Monte Carlo simulation "," Monte Carlo sampling ", the name being taken after the name of Monte Carlo city of Monaco (Dirk P. Kroese, 2011; Robert L. Harrison, 2010; Alexander Shapiro, 2003), and in the States The United States of America is also referred to as the "Las Vegas method".

Ion Dobre and Flower Mustache-Horpos consider that the Monte Carlo method demonstrates its efficiency in analyzing phenomena and processes characterized by a large number of variables. It is shown that the method is used for the purpose of designating two techniques:

- The first technique involves evaluating the different integrals by using random variables;
- The second technique involves the replacement of a real phenomenon with a statistical one, which can be studied by modern calculation methods.

We are of the same opinion with Alexandru Manole, Constantin Anghelache, Mădălina Anghel, Andreea Marinescu (2016, p. 51), who considers that the Monte Carlo method presents a sensitivity analysis that returns the unilateral effects of the variables under various scenarios that can calculate the effects of a limited number. changes.

In another opinion, the Monte Carlo method (Samik Raychaudhuri, 2008, p. 91) relies on random values and statistical analyzes to calculate the results. This simulation method is closely related to random experiments, for which the result is not known in advance.

From the perspective of Frances Greselin, Fabio Piacenza and Ricardas Zitikis (2019, p. 2), the Monte Carlo method is a flexible one and widely used, but it requires intense calculations that slowly converge to the correct result.

In the Monte Carlo technique, as Victor Dragotă, Anamaria Ciobanu, Laura Obreja, Mihaela Dragotă (2003, p. 87) take into account, “the probability of the emergence of a certain economic status, but for purely rational reasons, which are directly related by the

preponderance of the objectivity of work and of the necessity of observing the law of normal distribution by the analyzed performance indicator. For each of these variables, the Monte Carlo method, a certain interval in which they can record values and a certain law of evolution. With the help of an electric calculator, it is possible to generate a series of values, at random, for each determined variable of the analyzed performance indicator ".

3. Research methodology

In order to perform a simulation based on the Monte Carlo model, the following steps are required (Georghe Barbu, Maria Miroiu, 2012, pp. 13-16; Daniel Manaţă, Pavel Fărcaş, 2010, pp. 60-62):

- Defining the problem, implies explaining the working variables. Also at this stage it is established: the set of admissible solutions, the standard error and the proposed effective method;
- Primary data collection, analysis, interpretation and processing. At this stage the statistical data are collected and characterized;
- The formulation of the simulation model, implies the determination of the measure of the statistical parameters of the random variables respective to the model;
- Estimating the input parameters of the model, in which the probability distributions of the variables are established;
- Evaluation of model performances and testing of parameters. In this stage, the results characterizing the variables are analyzed;
- Description of the simulation algorithm and writing the calculation program. The evolution cases of the model and the calculation error for each individual case are specified;
- Validation of the model, requires the certification of the performance of the model;
- Planning simulation experiments, estimating the statistical characteristics of the variables and estimating the results;
- The analysis of the simulated data, implies the interpretation of the model results.

The model proposed in this study is characterized by the following system described (Daniel Manaţe, Pavel Fărcaş, 2010, p. 60):

1. the entries include:

- *Input parameters* - p1, p2, ..., pn, which are known in the analysis;
- *Random variables* - X1, X2, ..., Xn, which depend on the evolution of the stochastic events;
- *The probability distribution to be achieved and cumulated* - f1, f2, ..., fn, which provides the association for each simulated size of the analysis;

2. transfers include:

- *The transfer function* called generic - g, depends on the system parameters and the random variables - $RK \rightarrow R$;

3. The outputs depend on:

- *Inputs* (input parameters, random variables, probability distribution);
- *Transfers* (transfer function).

Thus we can say that the model generates random vectors according to the laws of probability for each random variable. Therefore this model (Y) is of the form:

$$Y = g\ (p_1, p_2, ..., p_n, X_1, X_2, ..., X_n) \quad (1)$$

Taking into account the values of the outputs, a statistical analysis can be performed which involves the determination of the following statistical indicators:

1. Arithmetic Mean ($\bar{x}$)

$$\bar{x} = \frac{1}{n}\sum_i x_i \quad (2)$$

2. Standard Dispersion (s)

$$s = \sqrt{\frac{1}{N-1}\sum_i (x_i - \bar{x})^2} \quad (3)$$

3. Mean Square Deviation (s^2)

$$s^2 = \frac{1}{N-1}\sum_i (x_i - \bar{x})^2 \quad (4)$$

4. Coefficient of Variation (CV)

$$\mathrm{CV} = \frac{s}{\bar{x}} \quad (5)$$

5. Allowable Error (E)

$$\mathrm{E} = \frac{s}{\sqrt{n}} \quad (6)$$

where: N - number of values
n - years / months / days

Due to the academic complexity in the study of expenses, the limits of the present study focus on the importance of accounting information in making decisions at managerial level. From here started the customization of the Monte Carlo model at the CONF Ltd. through the scenario of the evaluation of the expenses, regardless of their nature. The name of CONF Ltd. it is a purely hypothetical one, with the purpose of maintaining the confidentiality of the data, although the company and the data on which the simulation was made are real and belong to the companies that own CAEN 1413 - Manufacture of other clothing (excluding underwear).

4. Results and Discussion

In order to highlight this simulation, CONF Ltd. it wants to reduce its expenses which vary from month to month depending on various factors such as: volume of work, investments made, consumption of electricity, gas, water, etc. For this simulation, we present below to CONF Ltd. the average expenditure range for 2017, spread over 12 months:

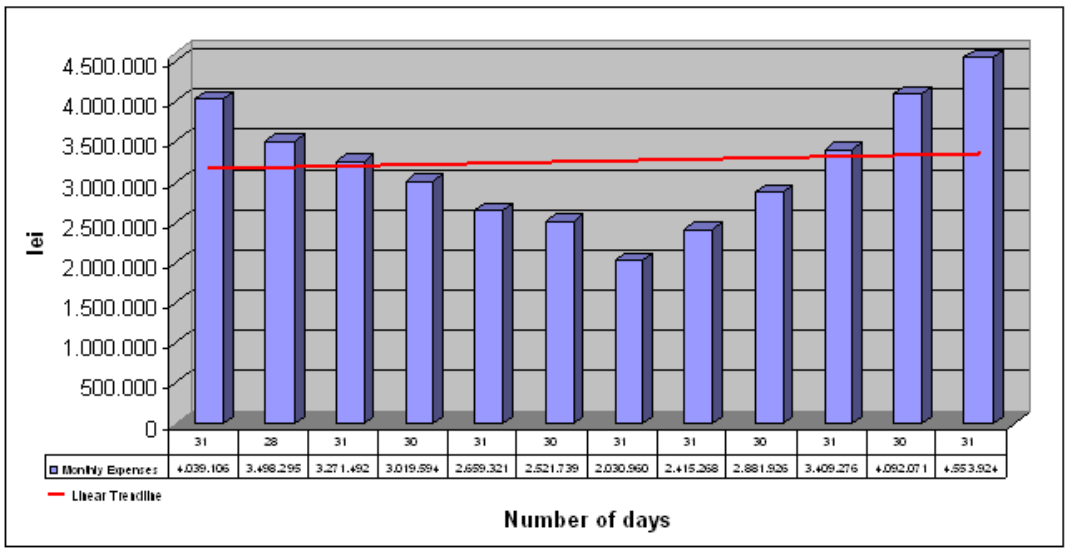

Chart 1. Expenses and trend in the months of 2017
Source: Own processing

We can say that these input parameters (expenses) at first glance present a relevant and slightly upward trend line. This fact is a warning of the increase in expenses, so it is necessary the need for a comprehensive analysis at managerial level to show what are the causes that led to the upward trend line. However, according to the discussions with the company representatives, we found that what led to this fluctuation of expenses in 2017 according to months is due to the production achieved, which in the summer period is much lower due to the holidays. granted to the execution personnel, and also to the reception of a much smaller number of clients from the clients. We note that the level of expenditure increases in the winter months, when the consumption with the suppliers increases, and production reaches the highest level of execution.

In order to determine an average spending range through the Monte Carlo model, we show in table no. 1 based on the 365 measurements expressed in days, the probability values of the 12 months analyzed.

Table 1. Probability distribution at CONF Ltd. in 2017

Probability	**Month**											
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Trust probability	0.950											
Achieved probability	0.085	0.077	0.085	0.082	0.085	0.082	0.085	0.085	0.082	0.085	0.082	0.085
Cumulative probability	0.085	0.162	0.247	0.329	0.414	0.496	0.581	0.666	0.748	0.833	0.915	1.000

Source: Own processing

The double sense of probability presents us the number of real possibilities of spending by frequencies, on the one hand and the degree of trust on the other (Petru Balogh, Pompiliu Golea, Valentin Inceu, 2013, pp. 33-40). For this study I considered it appropriate to establish the probability of confidence at 95%. We notice that the probability was realized during the whole period analyzed, and the sum of the calendar days for the year 2017, depends on each month separately. So we can say that between the

days of a month and the total of the days of a year there is dependency, although the two variables in the present study - the expenses and the number of days are independent.

Based on the results obtained in the calculation of the forecast achieved and cumulated from the table no. 1, we believe that the measure of the chances in the present model was reached, because in all the 12 months the probability registered values over 0, even more reaching in December 2017, in the case of the cumulative frequency of the number of days to a certainty, a necessary element by which we demonstrate the validation of the model.

To continue the study in establishing an average value of expenses, we consider a sample of 31 days for which we determine on the basis of random variables, the square of the deviation from the average of the expenditures in 2017 at CONF Ltd.

Table 2. The frequencies of the random variable for December 2017 according to days at CONF Ltd.

-lei-

Day	Random variable	Expenditures - xi	xi - $\bar{x}$	(xi - $\bar{x}$)^2
1	0.092	209,147	57,349.53	3,288,968,973.55
2	0.707	199,695	47,897.53	2,294,173,699.42
3	0.474	165,249	13,451.53	180,943,749.02
4	0.343	156,598	4,800.53	23,045,120.28
5	0.624	161,573	9,775.53	95,561,051.95
6	0.088	189,147	37,349.53	1,394,987,640.22
7	0.283	107,974	-43,823.47	1,920,496,230.68
8	0.790	156,764	4,966.53	24,666,453.35
9	0.179	143,491	-8306.47	68,997,388.48
10	0.452	135,249	-16,548.47	273,851,749.02
11	0.482	135,249	-16,548.47	273,851,749.02
12	0.233	143,491	-8,306.47	68,997,388.48
13	0.333	116,598	-35,199.47	1,239,002,453.62
14	0.321	107,974	-43,823.47	1,920,496,230.68
15	0.317	107,974	-43,823.47	1,920,496,230.68
16	0.136	189,147	37,349.53	1,394,987,640.22
17	0.088	196,477	44,679.53	1,996,260,698.88
18	0.125	159,241	7,443.53	55,406,188.48
19	0.931	153,924	2,126.53	4,522,144.02
20	0.774	156,764	4,966.53	24,666,453.35
21	0.285	117,974	-33,823.47	1,144,026,897.35
22	0.476	135,249	-16,548.47	273,851,749.02
23	0.655	161,573	9,775.53	95,561,051.95
24	0.978	153,924	2,126.53	4,522,144.02
25	0.356	116,598	-35,199.47	1,239,002,453.62
26	0.445	135,249	-16,548.47	273,851,749.02
27	0.613	161,573	9,775.53	95,561,051.95
28	0.645	133,478	-18,319.47	335,602,858.95
29	0.545	162,618	10,820.53	117,083,941.62

30	0.908	183,962	32,164.53	1,034,557,204.55
31	0.530	200,509	48,711.53	2,372,813,479.68
Total	-	4,553,924	-	23,078,000,335.47

Source: Own processing

For the representativeness of the chosen sample, 31 random values (numbers) from the range (0,1) were considered, corresponding to which was chosen the expenditure whose value of the cumulative probability is immediately higher than the random number. Considered as a whole, the sum of the deviations from the average of the expenses is equal to 0, thus the equality is verified methodologically. The statistical series presented by the sample can be interpreted by the size "xi", which appears most often in the sample. This value of the expenses is equal to 135,249 lei, appears in four days of the sample and is therefore the most representative.

Summary of the Monte Carlo model for the expenditure variable at CONF Ltd. depending on the number of days, it finally involves establishing the average of the statistical variable, of the dispersion and of all the specific indicators of the econometric modeling, which are presented systematically in the table no. 3.

Tabel 3. The script centralizer at CONF Ltd. according to the Monte Carlo model

-lei-

Indicator	Value
Arithmetic Mean - $\bar{x}$	**151,797.47**
Standard Dispersion - s	795,793,115.02
The Mean Square Deviation - s^2	**28,209.81**
Variation Coefficient - CV - %	**18.58**
Allowable Error - E	0.05
Distribution *t*. Values tα/2, no. degrees of freedom	2.04
Average range of expenses / day	**(141,461.53; 162,133.41)**

Source: Own processing

The Monte Carlo model presented under purely statistical influences for the sample of expenses during 2017 according to days, at the analyzed company, synthetically describes the model dashboard, where all the synthetic indicators of variation are presented.

Interpreted from a contextual aspect, the parameter of the overall position of the expenditures at CONF Ltd., Indicates the central tendency of the consumption of the described sample. Note that the arithmetic mean of the sample does not coincide with any of the monthly expenditure values, but falls between the minimum and the maximum specific consumption of the sample. By this we mean the representativeness of the sample arithmetic mean and implicitly the possibility of use in practice.

By determining the average of the squares of the deviations from the average, we determined the dispersion that is expressed without unit of measure. Its result presented in the table no. 3, shows us that the series of expenses analyzed for the sample revolves around the arithmetic mean. The average square deviation presented means that the number of days of the sample at a level of expenses equal to 4,553,924 lei, deviates on average by 28,209.81 lei from the estimated average. The value of the coefficient of variation expressed as a percentage presents the statistical sample analyzed as being below 35%, so that the sample of electricity consumption for the 31 days is a homogeneous one.

From this we deduce that the intensity of the variation is a reduced one, and the average is representative.

Due to the confidence probability established in table no. 2., the permissible error value in this case is 5% (Camelia Raţiu-Suciu, 2005, p. 458). A final impediment in establishing the average range for the value of expenses in 2017 in CONF Ltd. was the extraction of t distribution, in the case of the present model for ($t_{0.05/2}$; 30), taken from the annexes of the book entitled Modeling and simulation of economic processes (Camelia Raţiu-Suciu, 2005, p. 458). We consider the average of the expenses of the sample expressed in lei / days of a month, a homogeneous one from an economic perspective, and from a statistical point of view we can say that it is a representative one.

5. Conclusions

We conclude by stating that CONF Ltd. through the simulation model presented it is useful to the management of the company for making managerial decisions in analyzing the financial position and performance. Therefore, we consider useful the study undertaken in order to reduce the expenses at CONF SRL, by redesigning the sewing machines that could be of last generation and that could help in the process of making the garment in order to reduce the expenses with the service providers, especially electricity.

The diminution of the economic benefits appeared in CONF Ltd. imposes measures necessary to streamline production activity and increase revenues, which we believe could be possible through investments to modernize work equipment, which in the long run could lead the company to favorable economic results, attracting qualified personnel, as well as customers with requirements especially satisfied. Therefore, the Monte Carlo model through the analysis presented aims to establish the financial balance at CONF Ltd. which has the role of diagnosing and adjusting from an economic perspective the activity carried out.

Due to the fact that the proposed model is one created for a real commercial company, active in the Romanian clothing industry, we consider that the proposed simulation process is a true one, which presents all possible results, together with their probabilities.

In order to reduce the expenses, especially of the production ones, we consider that it would be necessary to use the value analysis that starts the analysis from the product design phase and continues until the final phase where the products reach the customers. We also believe that the Monte Carlo method can be introduced for the purpose of analyzing expenses, as this is generally realized and applied by consulting companies, having as an informative purpose for companies, which, following this analysis, the management can make optimal financial decisions.

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CORPORATE GOVERNANCE POLICY AND ITS INFLUENCE ON THE FINANCIAL REPORTS TO THE PUBLIC INTEREST ENTITIES

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Abstract**:** *For the global market players, financial and accounting information has become an essential component of the corporate governance mechanism. In the current context, the influence of corporate governance principles and codes on the structuring and quality of financial-accounting information in financial reporting is the basis for approaching quality financial reporting at the level of public interest entities. The impact of accounting phenomena and trends and those related to the transparency degree of information (central issue of governance codes) on the economic decisions of the financial-accounting information users reveal the importance of the present research study.*

Key words: *financial reporting, corporate governance, transparency and quality of the financial-accounting information, decisions, financial communications.*

JEL Code: *M41 – Accounting; G34 – Governance.*

1. Introduction

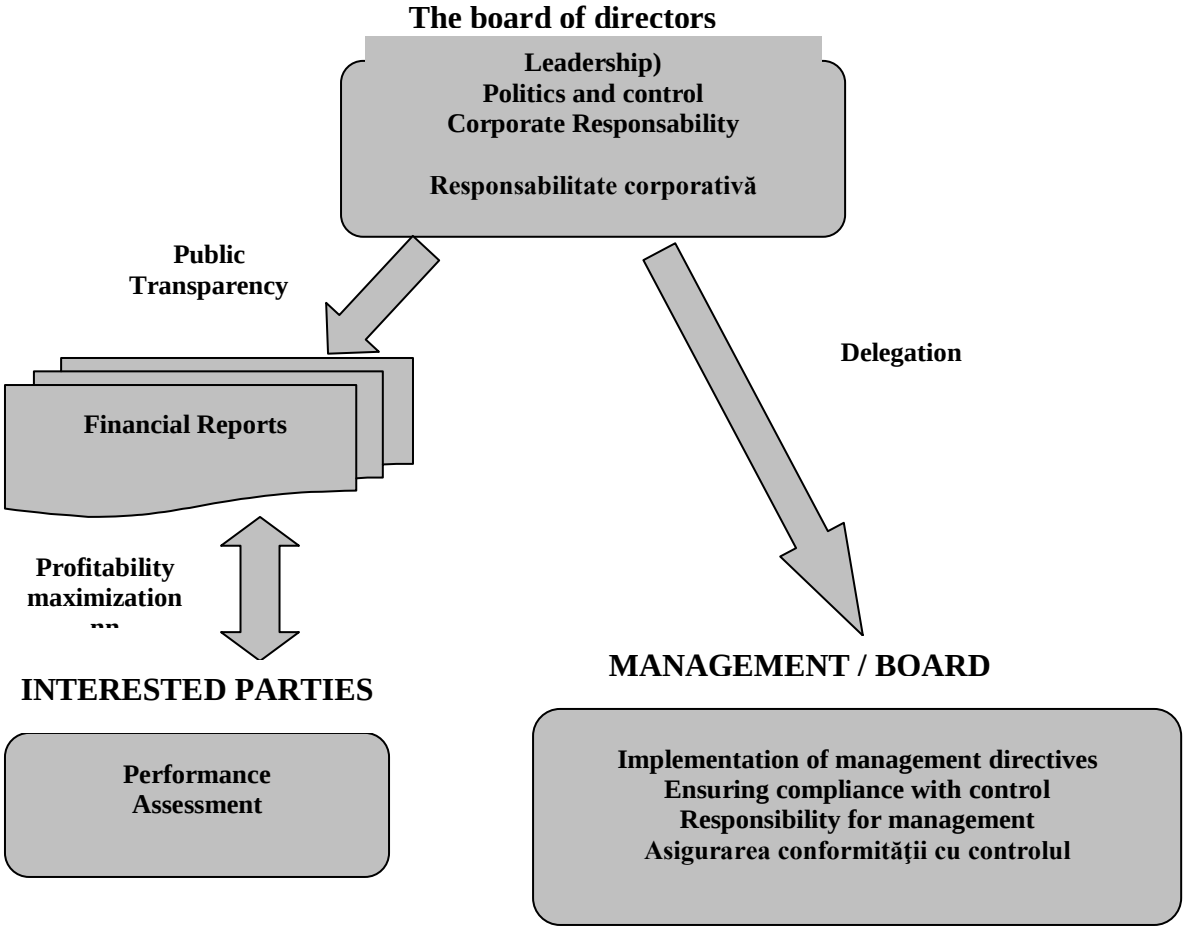
The financial reporting rules, in line with efforts to modernize the accounting techniques and policies, represent an essential element of the corporate governance system at European and global level. The relevant and especially credible information is intended to reduce agency conflicts and build trust between stakeholders' groups (Feleagă and Vasile, 2006, pp.21-30). The financial markets unification, the IT facilities for information disclosure and external communication, the volatility of the economic environment and the competition acceleration have imposed companies a continuous adjustment in order to be operational and efficient in the market. The lack of adequate information regarding the communication and transparency of information in financial reports has in some cases led to a corrosive effect on the level of trust in the reporting process.

In today's context, for globalized market players (large listed companies, investors, financial analysts, regulatory bodies etc.) the financial-accounting information is a "public asset" (Ionașcu and Ionașcu, 2006, p.243) used in decision making and therefore it must ensure the comparability that leads to its standardized production.

In the current business context, financial - accounting information has become a component of corporate governance mechanisms, transparency and quality of information being one of the principles of these mechanisms. Thus, it was questionable whether the financial reports published by the companies should serve the interests of shareholders, a specific approach of corporate governance in the Anglo-Saxon countries, or all the stakeholders' interests. The issue of the financial statements objectives (Ionașcu and Ionașcu, 2006, p.243) led to a series of discussions between the IASB and the FASB, both councils acknowledging (based on the conclusions of IASB-FASB, 2008:BCI.20) that the designation of investors as the main group of users (owner theory) offers an unrealistic perspective on financial reporting, the entity theory being considered much more appropriate for the current economic model.

Schematically, the main aspects of the corporate governance - financial reporting relationship can be represented as follows:

Figure no. 1. The corporate governance and the financial reporting



Source: Apud <Model Annual Report>, Deloitte, available on www.deloitte.com .

2. Literature review

Regarding the corporate governance (CG) and along with the concerns about its activity improvement, the European Federation of Accounting Experts of (EFAE) considers it advisable to revise the recommendations on CG (FEE, 2003) "so as to become equally effective in the preparation and presentation of quality financial information, by applying IFRS". The document also refers to the basic elements inside and outside the enterprise (components of the CG system) as they are necessary for a quality financial reporting. In this context, the EFAE also supported the conclusions of the European Commission regarding the imperative introduction of a European Code of Corporate Governance and a common approach at European Union level of the provisions of the other codes.

In connection with the organization and management methods of a company at international level, there are both "monistic" management systems and "dual" management systems. Thus, within the "monistic" management, the shareholders may ask the board to be responsible for the company management and also for the results and the financial statements quality. The Cadbury Committee recommends that in the Board of Directors these companies appoint both executive directors responsible for the company management and non-executive directors who monitor, supervise and control the financial reporting. Within the "dual" management there is a board of directors with responsibilities for the company strategy and a supervisory board that ensures the quality of financial

reporting and the resolution of conflicts of interest. Certainly, in practice, this delimitation of duties is not very rigorous, being influenced by the communication level and the habits of each area. In most countries where the "dual" structure is generalized, the supervisory board must analyze and approve the financial statements. In Germany, for example, the employees can appoint or elect members of the supervisory board, and in Italy, in addition to the board of directors, there is also a union council made up of independent accounting professionals with similar duties to audit committees. In Romania, the legislation stipulates the certification of financial statements by an independent auditor. In almost all countries there are concerns for the shareholders' protection, the balance of power within the governing bodies, the organization of the internal control, the certification of the financial statements of independent bodies, the understanding of the transparency and the quality of the financial information. Therefore, the expansion and globalization of the financial markets have required a consensus regarding the transparency and quality of the information presented through the financial reports, a first step being the adoption of IFRS standards.

Regarding the level of quality of financial - accounting information displayed by the public interest companies in Romania, a series of studies have been carried out. Hence, Ionaşcu (2008) is conducting an empirical study that reveals mediocre scores on the quality of information published by the listed entities, underlining the hypothesis that the information quality is reflected in prices, and entities with a better information level are more appreciated by investors. Similarly, Bogdan and Pop (2008) carry out a study that reveals a low level of voluntary communication practices.

C.M. Vasile's study (Vasile, 2008, p.155) of a sample of 140 companies from four emerging countries (Romania, Poland, Czech Republic and Hungary) shows that, in terms of GC improvement, priorities are aimed at improving the internal GC mechanisms (67% for Poland and 42-47% for the other three countries) and the accounting standards, auditing and disclosure of information, as well as reducing the concentration of ownership (especially in the Czech Republic) and restricting transactions with related parties (especially in Romania).

3. Research Methodology

The investigation methodology included general and specific approaches regarding the critical analysis of the financial reports quality and the way the information is generated in the entities of public interest. Through *theoretical documentation*, there were taken into account the bibliographic sources related to *the corporate governance - financial reporting* relationship at the level of public enterprises and to the accounting and their financial-accounting information system. These sources were published in books, articles, printed studies and / or published online, relevant national and international accounting standards and regulations, official documents of the different profile bodies (IASB, FASB, SEC, EFRAG, etc.), analyses of the annual reports of some entities of public interest. The graphical representation method comes to visually present relevant aspects of the study. For the collection of theoretical data, the databases of some university libraries were consulted, such as: Central Library of the Academy of Economic Studies in Bucharest, Multimedia Library of "Valahia" University in Târgoviște, Central University Library in Cluj Napoca and University Library "1 December 1918 "from Alba Iulia. Access to online publications was obtained by consulting scientific databases such as Thomson Reuters, Springerlink, Ebsco, Eolss, Emerald, RePec, Jstore.

The empirical research was based on the specialized literature revision, on other authors' studies, but also on the practical realities within the entities of public interest. The applied deductive method regarded analysis of the financial - accounting information

systems, but also of the content and quality of the financial accounting information from the financial statements of the public interest entities, as a final product of the system. The content analysis referred to that research technique for the objective, systematic and quantitative description of certain communications content, going to be interpreted later on.

4. Corporate governance and financial reporting quality

The financial reporting quality can be classified into four distinct categories depending on the level of transparency of the information contained:

- Poor quality financial reports, which contain a minimum level of accounting financial information that cannot be identified on the public interest entity's own site, in case the entity has a site.
- Financial reports of acceptable quality, provided that the public interest entity makes its financial statements known on its website.
- Good quality financial reports, in this case the public interest entities must make public both the financial statements and the management reports, the auditors' reports and any other information possibly relevant for the decision made by potential investors or any other interested parties.
- Financial reports of excellent quality, when the information quoted as such is complete, uncensored and undoubtedly proving the extent towhich the public interest entity has acquired the principles of corporate governance and has applied them throughout the previous financial year in own activity.

We can conclude that the application of the principles included in the codes of good practice in corporate governance was reflected in the structure and quality of financial-accounting information. However, in order to assess the stage of implementation and development of corporate governance, there must be a system based on two defining elements:

- the rating given to the country where the public interest entity exists;
- the rating given to the public interest entity.

The estimation of the country qualifier takes into account the support that is granted to the public interest entity by the state so that it could reach an adequate level in terms of corporate governance, achieved through: creating and developing a legislative framework in the field of corporate governance, regulating the capital market also through legal norms, bringing the way of reporting the annual financial statements to a common denominator for all public interest entities and last but not least the observance of international financial reporting standards .

The estimation of the public interest entity qualifier is based *on the ownership structure, on the transparency of the financial accounting information, on the efficient relationship with the stakeholders, on the executive directors' degree of independence and on the performance evaluation method.*

By summing up the ratings given to the country and to the public interest entity, respectively, the achieved final score helps potential investors to substantiate their decisions:

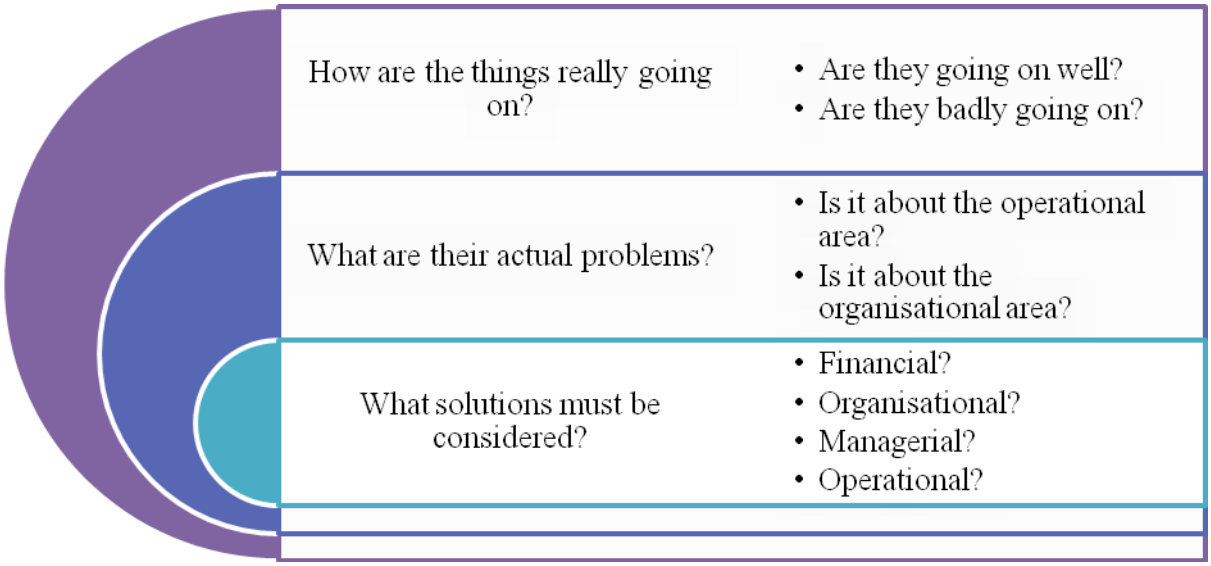
- the better the country's rating, the greater the confidence of investors;
- the lower the rating of the public interest entity is in stagnation or regression compared to the previous reporting period, the lower the investors' security level;
- for two public interest entities with the same rating but from different countries, the country rating is given priority and the investors' attention is directed to the public interest entity that operates in a country with a developed rating.

The financial-accounting information provided by the annual financial statements represents a range of essential elements in the development of the corporate governance concept for the following reasons:

- it strongly influences the decision-making process at the level of the public interest entity;
- it provides a complete, clear and timely picture of the financial results of the performed activities for everybody interested in the economic life of that entity;
- it accomplishes the integration of information and the connection between the economic field and all the other components of the information system developed at the level of the public interest entity.

The financial-accounting information provides answers (Figure no. 2) to questions of great importance both for the employees of the public interest entity and for the members of its management bodies, for the shareholders and for the potential collaborators as well.

Figure no. 2. Questions for the financial-accounting information



Source: own processing.

The corporate governance governs and controls the activity of the public interest entity. As an important part of this activity, the financial-accounting field is the steady provider of the collected and properly processed information, by means of the accounting instruments available, which provides all those interested, with information to support the decision-making process. As the main target of the shareholders of a public interest entity is to maximize the profit, we can undoubtedly state that the financial-accounting information represents the key elements, essential and relevant for good activities administration.

5. The financial reporting in the context of corporate governance reqirements

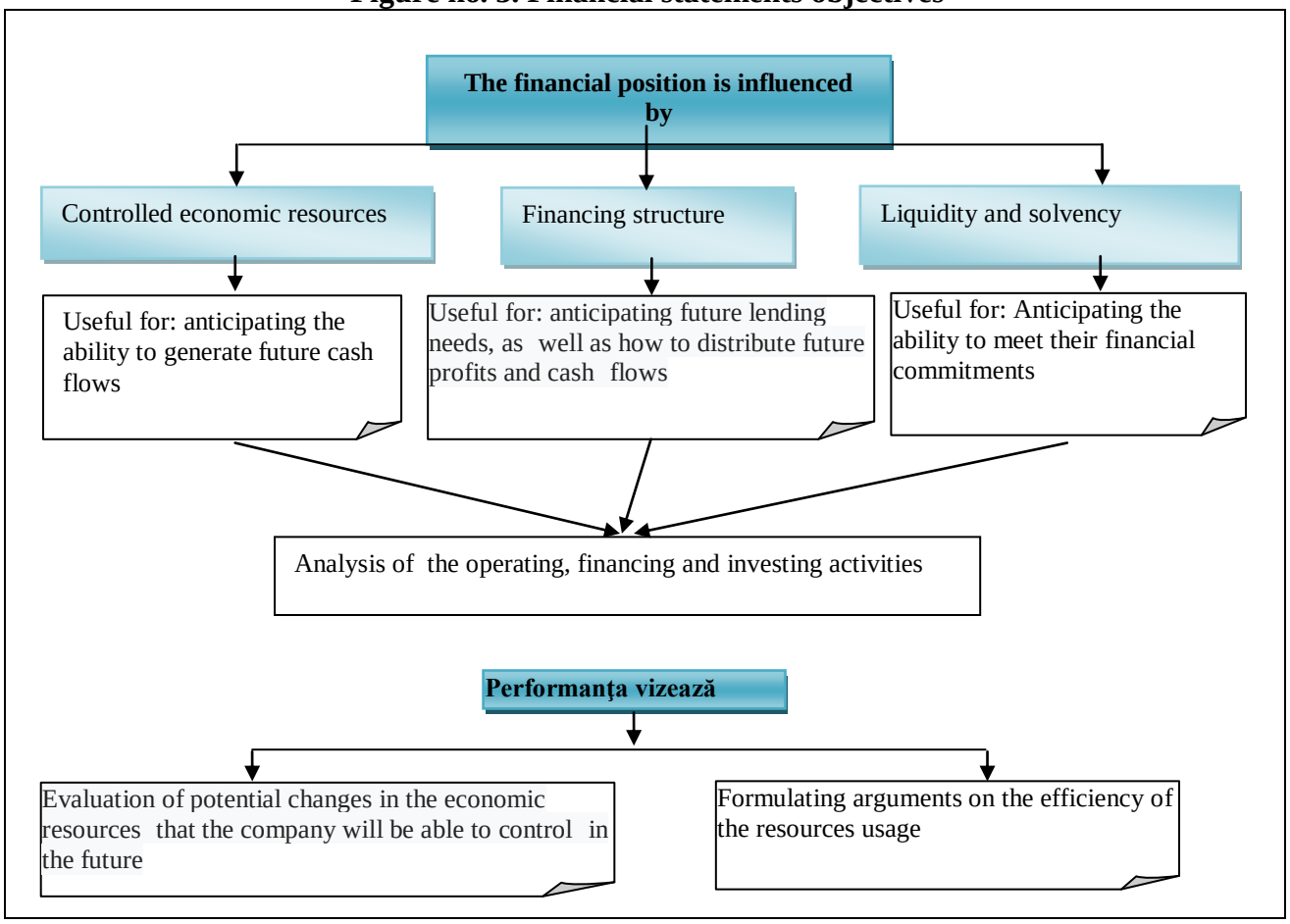
Through the annual financial statements a public interest entity synthesizes information regarding the following aspects*: the achieved performances; financial position; resource management efficiency; the results of the management and administration of the activities; deviations / deviations from the predicted targets.*

The financial reporting is performed in the context of the existence and application of the International Financial Reporting Standards[1], and the information cumulatively fulfills the following functions:

- the function of information centralized display provided by the financial-accounting system. The financial-accounting information establishes a reliable system of economic-financial indicators, of result and performance reflecting the financing efficiency and the use of the resources available to the public interest entity;
- the function of the results communication. All the other activity areas within a public interest entity are based on the planification, development and reports making on the activities results by sharing information in the financial reports. This fact gives the financial accounting information a privileged position within the information system of the public interest entity.
- the analysis function. The financial statements reflect in the most eloquent way the achievement of the objectives foreseen for the reporting period, in the context of the efficient use of the resources available to the public interest entity together with its ability to attract new resources under advantageous conditions. Therefore it offers an accurate picture of the deviations from the established performance indicators and the best solutions for improving the quality of the carried out activity are also identified considering the respective information.
- the forecasting function. The financial statements provide the basic information in making forecasts on the way the activity will be carried out in the next financial year and on the expected results. The decision-making process is clearly based on financial accounting information and in this context a graphical illustration of the objectives of the financial statements is made in Figure no. 3.

[1] http://www.mf.gov.md/ro/actnorm/contabil/standartraportianuarie2015;

Figure no. 3. Financial statements objectives



Source: apud Ciuhureanu, A.T., Balteş, N., Aspects regarding the accounting Information offer through the financial statements, Studia Universitatis „Vasile Goldiş din Arad", nr. 1/2009

The impact of the financial reports in the context of the demands of corporate governance is shown itself especially long term, consisting of:

- increasing the possibilities of comparing the economic position and performances of public interest entities, which allows it to be observed on the market under conditions similar to any other entity;
- increasing transparency and credibility of accounting financial information in the context of resizing the number of users;
- stimulating the access to finance with reasonable costs for those public interest entities that improve their quality level of financial reports addressed to all interest groups;
- ensuring the investors' protection of interests relying on the application of the corporate governance principles and on meeting their expectations regarding the relevance and quality of the information provided through the financial reports.

6. Valencies capitalization of the financial-accounting in achieving corporate governance

In the long run, a public interest entity resists and develops when its ability to make a profit is high. In this case, we refer to a "*satisfactory profit*" in the context of the influence of internal and external factors.

Gaining profit becomes both the engine that sets in motion a public interest entity but also the result of its good administration. The quality of the profit made by a public

interest entity must be measured by the management or by the interested specialists in the context of the information provided by the financial-accounting system (Crecană, 2000, pp.28-29).

The public interest entities are compelled to create their own manual of accounting policies and procedures in compliance with the specific activities carried out, the organizational culture, the management requirements and especially with the shareholders' expectations. These rules, regulations and procedures can influence the increase or decrease of the patrimonial result. As the accounting policies and procedures are individualized on a case-by-case basis, there are encountered situations when, within the public interest entities, the provisions of the above-mentioned manual prevail, the specialists in the financial-accounting field either fail to make substantiated forecasts or they apply alternative accounting treatments or approach an original way of using accounting techniques, all of them being at the limit of the legal provisions in force. Thus, both the reality of financial reporting and the principles of corporate governance are seriously harmed, in terms of affecting the performance of the public interest entity.

The decision-making system based on the financial-accounting information must be coherent, correct and in accordance with reality in order to find the optimal solutions for the deficiencies arising in the activity of the public interest entity (Ișfănescu, Stănescu, Băicuși, 1999, p.17). Moreover, the good corporate governance depends on the quantity and quality of financial-accounting information as well. Hence, in order to be useful for the promotion a modern management model, financial-accounting information is characterized by the fact that it concretely and correctly presents the economic phenomena going to positively or negatively affect the public interest entity. The information is highly accurate and defines the size of the flows availability.

Last but not least, the investment performance is closely correlated with the qualitative level of financial-accounting information (Tiessen and Waterhouse, 1983, pp.251-267). The latter is the instrument used by the investors in the public interest entity and also by the potential ones to make their calculations and forecasts and to consequently make the decisions for their expected benefits. Therefore, the financial-accounting information becomes a reliable companion for all investors, whether they are present or prospective.

7. Connections between the decision-making process and the financial accounting information

The financial-accounting information helps the public interest entity identify the inappropriate activities and take the optimal steps to obtain the best results in future. The efficient use of human, material and financial resources in the accounting financial information is revealed by the knowledge of the past and present activity of the public interest entity as well as by identification of the causes that generated the accomplished results.

The importance of accounting financial information is significant because *it can influence the entire economic policy adopted at the level of the public interest entity,* relying on its value assessment and acting as key elements in streamlining the decision-making process.

Considering this information as an essential source of data useful to managmenent and other interest groups, it provides well defined purposes, as regards:

- reporting;
- estimation of economic potential;
- achieving efficient management of assets, liabilities and equity;
- relation to the external environment.

As a basic element in the decision-making process, the financial-accounting information helps management to properly plan activities for the future financial year, predict the evolution of the public interest entity and take preventive measures to adjust the gaps, as well as find optimal solutions for the performance improvement.

Based on the accounting financial information provided by financial reports, a system of useful indicators is set up in assessing the activity of the public interest entity and in making appropriate decisions.

From this point of view, the result indicators are the most interesting ones as they reflect in the best way the performances at the same time achieving the evolution in time. Here there are enumerated some of them:

- sales volume;
- gross profit;
- the operational activity result;
- the result of financial activity;
- the result of the investment activity;
- the net profit.

Another category of indicators is represented by the efficiency indicators and on its basis there are assessed the results in relation to the used resources, they actually measure the available resources that can bring profit. The most relevant are:

- the rate of economic profitability;
- the rate of return on income;
- the rate of financial return;
- the rate of consumed resources' return.

The third category of indicators consists of management indicators assessing how efficiently the public interest entity uses its assets. These are:

- the number of current assets rotation;
- the period of avarage income;
- the number of stocks rotation;
- the number of total assets rotation.

The performance of the public interest entity depends on its ability to make profit. The measurement of its level and evolution is carried out by the profitability indicators that consist of:

- the profitability of production - the ratio between the production income and its volume represents the value of the total receipts related to direct expenses;
- the net profitability - the ratio between the net profit and the volume of the accomplished production and represents the capacity of the public interest entity to make profit from the whole performed production;
- the assets return - the ratio between the net profit and the average value of the assets represents the efficiency of capital used by the public interest entity
- the financial profitability- the ratio between net profit and the average equity value represents the satisfaction degree of shareholders.

Taking into account the interpretation of the value indicators resulted from the public interest entity activities, the management can make decisions focused on the problems generating distortions in the economic activity.

8. The relationship of corporate governance with the SIFC of public interest entities

In order to achieve its objectives in the most efficient conditions, a public interest entity must take into account the existence of a financial-accounting information system to carry out the following operations:

- recording, processing, conveying and maintaining information in compliance with the trend of resources available to the public interest entity and deviations from the established targets;
- creating conditional connections between the decision-making system and those responsible for execution;
- balancing the influences of internal and external factors on the public interest entity evolution.

The decision is the conscious choice between several possible actions of the modality to be taken so that the results are as expected. In order to make the right decision for the situation faced by the public interest entity, it is necessary for a financial-accounting information system to operate within it and there is required an ability to provide complete, real and timely information.

Therefore, for making decision, it is necessary to know the achievable objectives, their accurate circumstances, to identify a number of options and to take into account the possible situations that will contribute to the objectives' achievement.

The financial-accounting information system of the public interest entity must support its functioning through three ways of acting, such as:

- *the execution system*, where the operative activities are carried out;
- *the management system*, which includes all decision-making centers, including their action on the execution system;
- *the information system*, which ensures the connection, in both directions, between the management system and the execution system, on the one hand and between them and the external environment, on the other hand.

9. The impact of corporate governance in the evolution of a reliable and optimal financial-accounting information system

The efficient communication of financial-accounting information highlights the business stodginess, the sales growth level and implicitly the increase of the people's trust. In practice, the total and partial lack of a public interest entity transparency, with regard to financial reporting, leads to suspicion on the users' behalf as well as to an unfavourable entity image.

The communication of financial and accounting information shall also be with the shareholders of the public interest entity. For any entity, the maintenance of interest in its own activities is valid both for shareholders and for customers and investors.

On the one hand the role of publishing financial-accounting information is to protect the shareholders' interests, especially the minority ones, and on the other hand it has to increase the value of the entity shares. In this respect, the communication of financial-accounting information represents an investment in informing shareholders and investors and an opportunity to identify the perceptions of the target audience, actions that ultimately lead to increasing the value of the public interest entity.

As for the communication of financial accounting information, one can state that (Pantea, 2009, p.19): *"the financial communication provides accounting and financial information such as two different products both as a source of use and as a purpose; the information sources are provided by the financial statements for accounting information and the systems of economic-financial indicators for financial information; the information destination is represented by the external environment of the enterprise, made up of the owners of enterprises, employees, state, etc. on the one hand, and of the financial institutions providing their capital on the other hand".*

By setting up an Audit Committee at the level of the public interest entity, there can be ensured an increasing transparency of accounting financial information. This is a

mechanism able to act on improving the quality of financial-accounting information for both internal and external users, as it uses the skills given by the Board of Directors, whose consultant is a representative of internal audit and control.

Nowadays, the transparency is increasingly demanded and promoted in business relations. The investors, as well as other interest groups, claim to be allowed the increasing access to financial-accounting information as well as to those regarding the administration of public interest entities. For an accurate image on the public interest entity, on the official websites or in the public information, the entities must include information regarding the ethical, social and any other performance besides the information about the economic performance.

In the current trend we can include the reports on the social, environmental and sustainable development policies of the public interest entities, specially yet not exclusively requested by the government institutions. They are of great importance in assessing the potential of a public interest entity, meaning that they must be as safe and credible as financial reporting. In this respect, reporting criteria have been defined in the three segments (social, environment, development).

The transparency is the mechanism used to explain the way of acquiring financial-accounting information and to provide their interpretation. The transparency creates an environment in which information on existing conditions, the decisions and actions are accessible, visible and easy to understand for everybody concerned. The transparency is translated into the open and sincere character of the public interest entity as follows:

- it improves the decision-making process based on the possibility of forecasting;
- it compels the public interest entity to face the reality of a situation;
- it determines the management to responsibly act, to justify its decisions and to explain the actions;
- it encourages accountability, strengthens discipline and increases the value of corporate governance at the level of the public interest entity.

The public interest entities must be sure that transparency is not threatening and the ensuring is not compulsory. When they overcome these barriers, they will learn how to use it for their benefit and will enjoy the confidence, performance and credibility of the large audience.

10. Conclusions

The working coordinates of accounting in the new information age aims at giving up many of the traditional tools and accepting others imposed by corporate governance codes and principles, as well as recognizing the quality of reporting and financial-accounting information as a necessity in decision making.

In this approach, for most public interest entities it is imperative to redesign an information system that corresponds to the accounting information demands, since the accounting information system of the public interest entities in Romania currently proves its imperfection altered by redundancy, inefficiency and overloading. Communication channels, circuits and accounting information flows, as incorrectly defined, still generate malfunctions and deficiencies with negative impact on the performance of the accounting information system and implicitly on the management process of these entities.

Situated within the scope of the information-decision-action relationship, the usefulness of the financial - accounting reports depends on the qualitative characteristics of the financial - accounting information as every public interest entity must have information that reflects reality. Whether we refer to the information provided by financial accounting and / or the information generated by managerial accounting, the public interest entities must be able to make the correct decisions taking the above mentioned into account.

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FINANCIAL INNOVATIVE APPROACHES TO ENSURE ECONOMIC SUSTAINABILITY

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Abstract: *The problem of ensuring the conditions of sustainable development is one of the most frequently discussed theme at international summits and meetings at different levels. The international community has recognized the degree of responsibility for future generations and outlined the concept of further development, but there are still difficulties in its implementation. The lack of uniform methodological approaches for the transition to a new development path, the lack of development of financial mechanisms and models of cooperation between international organizations and local communities - all require generalizations of modern experience and practical actions on the path to sustainable development. In this regard, the authors analyzed innovative financial approaches used for economic sustainability.*

Key words: *Sustainable development, innovations, blended finance, green economy, Moldova.*
JEL Classification: *G02.*

1. Introduction

In recent decades, the problem of ensuring the conditions of sustainable development is one of the most frequently discussed theme at international summits and meetings at different levels. Especially often this topic and everything connected with the financing of new development goals appears on the agendas of intergovernmental discussions after the onset of natural disasters in the world. The international community has recognized the degree of responsibility for future generations and outlined the concept of further development, but there are still difficulties in its implementation. The concept of sustainable development (CSD) today is a kind of synonym for the well-being of life. However, the realization of this does not lead to effective measures. The lack of uniform methodological approaches for the transition to a new development path, the lack of development of financial mechanisms and models of cooperation between international organizations and local communities - all require generalizations of modern experience and practical actions on the path to sustainable development.

2. Interaction of the economy with the environment

2.1. Literature review

The fundamental principles of the interaction of the economy with the environment were laid for a long time by such world-famous scientists as D. Meadows, R. Hüting, M. Mesarovic, E. Pestel, J. Forrester, D. Gabor and others. Later, these problems were reflected in the works of such scholars as G. Daily, J. Bartholomew, P. Davis, and others. Works on financing sustainable development began to appear in the late twentieth century, their authors were J. Gembrell, D. Stiglitz, D. Makey, P. A. Victor, M. Friedman, S. Ketkar, L. Emerton, M. Porter, P. Rogers, and others. Of great scientific interest are studies conducted under the auspices of the UN, the World Bank and the World Wildlife Fund.

2.2. Research methodology

In present paper were used comparative analysis in defining and identifying innovative approaches to ensure economic sustainability.

2.3. Green economic development

Applying **green economic development** as a priority at the national level will help to attract investment in environmental protection, modernize the national economy and at the same time promote the country's image in the context of European integration, and at the regional and global levels to ensure practical application of the norms of the Association Agreement between the European Union and the Republic of Moldova.

The concept of a **"green economy"** does not replace sustainable development, but is increasingly recognizing the relationship between sustainability and a green economy. In this context, the growth of incomes and employment of the population are influenced by public-private investments and can create opportunities for increasing the scale of financing in order to stimulate the transition and strengthen the role of the financial sector as an agent of green economy changes.

Modern practice is characterized by the erosion of the goals of sustainable development, the unsystematic distribution of funds, the lack of clear motivation to help the underdeveloped countries, and extremely insufficient financial support. In practice, the solution of world problems, which are widely discussed during numerous summits, are postponed, and the deadlines for taking measures are stretched to uncertainty. Moreover, during the recession, when the financial crisis comes to the fore, countries are in no hurry to send money to solve problems related to sustainable development. For example, *the Sustainable Development Impact Summit 2018* (WEF) is a platform to fast-track solutions to the world's most complex problems. By focusing all sectors of society into working together and applying technological innovation we can achieve far-reaching, sustainable impact. The summit is spotlighting and scaling 100 alliances, coalitions and cross-sector initiatives for climate action and sustainable development on the 17 *UN Sustainable Development Goals* below to find out how each coalition is driving collective action. Most coalitions are working on multiple Goals. Also, the *Sustainable Development Investment Partnership (SDIP*) is a platform of public, private and philanthropic entities with shared ambitions to scale the use of blended finance in sustainable investments in developing countries. The initial focus of SDIP is on sustainable infrastructure investments, given their importance to closing the overall financing gap to the Sustainable Development Goals (SDGs). SDIP focuses on activities that facilitate transactions and scale and replicate models to enable broader systemic change for financing sustainable and climate-resilient infrastructure projects in developing countries. Since its inception in 2015, SDIP has put in place a solid foundation to mobilize and scale blended finance in sustainable investments in developing countries.

Scaling Blended Finance Mechanisms. SDIP identify, scale and replicate blended finance mechanisms and instruments that are effective in bringing projects to a financial close. SDIP has showcased 14 financing models, with efforts underway to replicate and scale the most effective of these. SDIP identifies blended finance mechanisms and instruments (i.e. guarantees, credit enhancements, and/or other structures) that can be scaled and replicated to catalyze more investments in sustainable development projects. Examples of *blended finance mechanisms and instruments* are:

1. **Local Currency Guarantees**: InfraCredit from Nigeria;
2. **Development Finance**: Sovereign portfolio risk transfer represented by Asian Development Bank; Synthetic securitization of non-sovereign loans represented by

African Development Bank; Managed Co-Lending Portfolio Program (MCPP) - International Finance Corporation;

3. **Green Financing Programmes**: Africa GreenCo; Scaling Solar; Sunref
4. **National Programmes / Funds**: Climate Investor One; Danish Climate Investment Fund; European Union External Investment Plan (EU EIP).

2.4. Regional Engagement on Blended Finance

Regional hubs. Through *regional hub* concept, SDIP is able to implement blended finance at the local level. Each hub is formed of an engaged community of local institutions (including local representatives of global institutions) able to provide specific insight into regional challenges, share best practices, and support governments on how to finance project pipelines effectively. SDIP regional hubs bring together a wide range of local institutions and representative offices of SDIP members to tackle financing challenges at the local level.

As international practice evidence, there is fragmentation and a lack of coordination across blended finance activities. In areas such as infrastructure, there is often duplication of efforts and funding from donors.

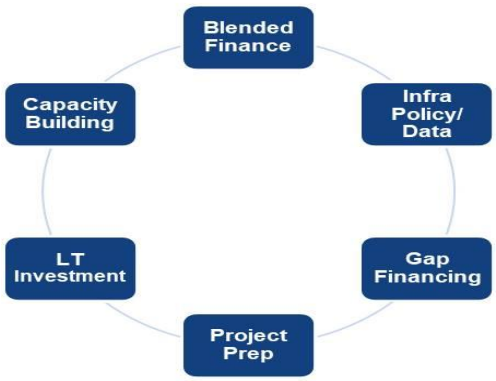

Figure 1. Coordination with other blended finance and infrastructure initiatives

In practice, the global crisis is expressed in the fact that natural resources are being depleted, the quality of habitat is deteriorating, and the level of investment in sustainable development in the world is declining. As access to international bank loans, bond issuance, as well as foreign investment is lost, the chances of implementing the CSD are reduced, threatening the political and economic stability of developing and developed countries.

Finding the best ways to finance CSD, achieving environmentally and socially sustainable economic growth is a key task for both the global economy and the national economies of various countries. The search for new ways of development is associated with the promotion of environmentally-oriented investments. It is believed that targeted investment policy can simultaneously contribute to the economic recovery and the creation of the necessary infrastructure for the long-term functioning model of sustainable development, socially and environmentally responsible business. In this context, the role of large financial institutions, state-owned banks, which must, first of all, meet the requirements of ensuring environmentally sustainable growth, is important. International financial institutions are called upon to become the main drivers in the implementation of the sustainable development process.

The failure of the modern model. The failure of the modern model to finance new development goals is associated with the lack of a unified financial policy for the provision of ODA and a well-directed funding strategy. As a result of an analysis of the practice of national strategies of countries in implementing the MDGs, it was noted that the financial mechanisms developed at various conferences and summits and adopted by most countries are still unimplemented. The largest international financial institutions - the World Bank, the GEF, the EBRD are the largest lenders of sustainable development goals, while not having clearly developed tools for allocating funds for development. The ODA standards agreed by all countries have not yet been reached - in the amount of 0.7% of GNP. An analysis of the official reports of these organizations on financing the development strategy, as well as the G8 and G20 programs shows that in achieving the goals of the sustainable development concept there is no coordination of funding priorities, the expenditure items for ODA are not supported by justifications from international financial institutions.

At the same time, the methodological approaches of independent private institutions are more adapted and developed to modern practice in the analysis of the system of sustainable development indicators; and the share of participation of private financial (commercial) structures in sustainable development exceeds the contribution of international financial institutions.

In order to improve the distribution of financial resources by major international financial institutions for new development goals, we consider it expedient to use methodological approaches (for example, equator principles, responsible investment principles, and other independent private institutions) to analyze the system of sustainable development indicators that are more developed and adapted to modern practice. Implementation of the CSD is possible only with the help of well-organized control by global independent financial corporations and the interest of the state (Moseikin, 2011) itself in this regard.

Moldovan banking system. The current level of development of the Moldovan banking system is clearly not in line with international trends in the transition to environmentally and socially responsible investments. MDG priorities are also not taken into account when selecting and analyzing projects. Under current conditions, active participation of state financial institutions is necessary. Since, having monetary resources, being leaders of the market, these organizations are able to form the conditions and mechanisms for the work of all participants. In accordance with the Environment Strategy for 2014-2023 (Strategia de mediu pentru anii 2014-2023), the cost of implementing the strategy will be about 9.1 billion lei, which is about 1% of annual GDP; most of the allocations are planned for the environmental infrastructure. Most of the costs of implementing the Strategy stem from the requirements of the Association Agreement and the Deep and Comprehensive Free Trade Area Agreement were in accordance with international best practices in economic analysis and cost-benefit analysis, taking into account the following components:

1) *The costs of the necessary investments* cover not only the investments necessary for the infrastructure, but also other non-recurring aspects that are not related to human resources. In this regard, external co-financing will be requested for capital investments. Recurring costs, for example, for maintaining and replacing assets by the end of their life span, will be funded from domestic sources.

2) *Costs associated with technical assistance* cover the cost of services of local and foreign consultants. Single quotas that are used for valuation are typical of financial intervention by the United Nations and the European Union.

3) *The time spent* by government officials is related to the provision of external financial assistance and is less than 1% of the total cost of applying the Strategy.

The size of the required capital investment is quite large, and therefore requires a substantial amount of external co-financing. At the same time, the allocation of state resources for maintaining and improving the environment in the Republic of Moldova should depend on a clear understanding of the environmental benefits that can be obtained as a result of investments, and not on monetary costs; there are needed at least 20% of capital investments in the short and medium term (about 1.8 billion lei) in conditions when the principles of environmental protection and sustainable development are not included in all sectorial policies and are not recognized as priorities, and *greening the economy is not perceived as a new engine of economic growth*.

Domestic financing can be provided both from the state budget and through other financial mechanisms. They may include the promotion of market economy instruments that take into account environmental aspects, the promotion of eco-innovations that may contribute to the creation of new business opportunities. Special funds, such as the National Ecological Fund, the National Fund for Regional Development, the Energy Efficiency Fund, etc., are an important tool not only for channeling internal cash flows to environmental investments, but also a means for combining external and internal financing.

In recent years, new financial technologies have emerged and become available, including to SMEs sector and new concepts corresponding to new financial instruments, for example:

• Blockchain: A digital, decentralized, shared and tamper-proof registry that stores and transfers information transparently, securely and autonomously, without a central authority or intermediary.

• Cryptocurrency: Virtual currency (such as bitcoin, etc) created from blockchain technology.

• Smart contract: A computer protocol that automatically executes certain actions defined in advance without the need for human intervention (according to the "if, then" principle).

• Token: Digital asset created on the blockchain and exchangeable on it. This tamper-proof token can be exchanged with another player without the intervention or authorization of a third party. A token is a smart contract (because it comes with conditions, including utilization).

• Tokenisation: Representing "real" assets (stocks, bonds, real estate units, precious stones, cars, etc) in the form of digital tokens.

The capital market is changing and offers opportunities previously unthinkable. These are aimed at (almost) all types of businesses and investors. New solutions have emerged and allow a real democratization of the capital market for companies, what energize the economic fabric and eco-innovation. These solutions are called Initial Coin Offering (ICO), Security Token Offering (STO) and Tokenization asset. These three approaches have a common basis: they rely on the block chain, which makes it possible to transfer digital assets without going through intermediaries.

These solutions are also matched by unknowns and risks. The universe of ICOs has also experienced setbacks after the period of euphoria late 2017-early 2018, which has cleaned up the market and now requires companies to submit offers stronger.

New technologies in the capital market are the following:

1. ICO et STO - a company that does an ICO aims to raise funds from a large number of people by issuing digital tokens, which it sells to investors for crypto currencies. In other words, it is crowd funding via the block chain.

There are two types of tokens most useful for businesses:

-Utility token - give access to a future use or service, like a presale. The company, thanks to the money collected, will be able to develop its product / service and the investors having acquired its tokens at the ICO will be able to benefit from its benefits in first-choice, in priority and / or at a reduced rate.

-Investment token / security token - a heritage value (e.g. share or participation bond). It is therefore "backed" by much more concrete assets and is subject to stricter regulations, which is why most experts are banking on a skyrocketing of this type of OIC, commonly known as STO, since they use "Security tokens".

The two types of tokens (utility and security) can be exchanged at the ICO for crypto currency or be resold later on a trading platform. Further, it is this listing on a secondary platform that gives the title its liquidity. The investor can then resell it to a third party and, as it is on the blockchain, in a completely traceable way.

2. Tokeniser 'existing products - the block chain makes it possible to "tokenize" existing products such as stocks or bonds. This approach has the merit of being clearly understandable and of interest to institutional investors. Indeed, the share of a start-up who wants to become a fully licensed bank is issued numerically on the block chain in the form of chips. Holders of these tokens are shareholders of the establishment and enjoy the right to vote and dividend rights, as a "traditional" shareholder.

These financial instruments allow companies to raise funds more flexibly than through an IPO or venture capital (which is not suitable for small companies). The fact of "tokenize" a part of its capital allows a company to have access to the capital market in a facilitated, inclusive way abroad. It becomes possible to encode in the underlying protocol of the token all information related to the transaction, facilitating reporting, auditing and compliance. Eventually, it could for example become possible to program and automate the payment of interest.

It also allows small investors to invest in a promising venture because the investment process is standardized. Finally, it offers an interesting visibility for the company. In short, STOs make it possible to democratize venture capital investment in companies, which is extremely positive for boosting the ecosystem of innovative companies (e.g. tokenization is likely to facilitate the financing of start-ups and SMEs).

There is no specific regulation for ICOs. The regulation will depend on the type of ICO and is based on the general law governing financial markets. An OIC using utility tokens is not subject to securities law, whereas a STO, which is based on investment tokens, so STOs are safer.

It can be mentioned that is further needed investigation of regulatory aspects of other countries, because there is a big disparity in this area. Thus, the United States considers all tokens as investment tokens and Asian countries have very heterogeneous legislation, ranging from the total ban of ICO to the active promotion of such projects.

It should be noted that traditional financial players and institutional investors are increasingly interested in this new asset class.

Investing in an ICO or STO certainly involves more risk than investing in a "blue chip". Companies are young, technologies are often in the making and legislation is weaker than for other asset classes (the STO is however subject to more rules than the ICO). The entrepreneurial risk associated with any young company is added to the highly volatile crypto currency and new technologies that few people still master.

3. Conclusions

The issue of ensuring the conditions of sustainable development is one of the most frequently discussed theme worldwide. Applying *green economic development* as a priority at the national level will help to attract investment in environmental protection, modernize the national economy and at the same time promote the country's image in the context of European integration, and at the regional and global level to ensure practical application of the norms of the Association Agreement between the European Union and the Republic of Moldova.

Author's identified that *blended finance mechanisms and instruments* (Local Currency Guarantees, Development Finance, Green Financing Programmes, National Programmes/Funds) can catalyze more investments in sustainable development projects. Still, as international practice evidence, there is fragmentation and a lack of coordination across blended finance activities; in areas such as infrastructure, and there is often duplication of efforts and funding from donors.

Finding the best ways to finance CSD, achieving environmentally and socially sustainable economic growth is a key task for both the global and Moldova's economy. The search for new ways of development is associated with the promotion of environmentally-oriented investments. In this context, international financial institutions are called upon to become the main drivers in the implementation of the sustainable development process, including in Moldova.

In order to maintain and improve the environment in the Republic of Moldova it should firstly understand clearly by all actors the environmental benefits that can be obtained as a result of investments. In this regard, state must support promotion of market economy instruments that take into account environmental aspects and promote eco-innovations that may contribute to the creation of new business opportunities; special funds, such as the National Ecological Fund, the National Fund for Regional Development, the Energy Efficiency Fund, etc. in Moldova are an important tool not only for channeling internal cash flows to environmental investments, but also a means for combining external and internal financing.

It is recommended for SMEs sector to use new concepts corresponding to new financial instruments that already become available and are able to boost additional development, such as: block chain, crypto currency, smart contract, token, tokenization; also new solutions and technologies that can allow eco-innovation and a real democratization of the capital market for SMEs are: initial coin offering, security token offering and others, that as result make possible to democratize venture capital investment, which are extremely positive for boosting the ecosystem of innovative SMEs. In the same time is further needed investigation of regulatory aspects in different countries, because at international level there is a big disparity in this area.

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PERSPECTIVES OF AGRICULTURAL SECTOR DEVELOPMENT THROUGH IMPLEMENTATION OF SMART TECHNOLOGIES (REPUBLIC OF MOLDOVA CASE)

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Abstract: *Digitalization of agriculture aims at optimizing the IT knowledge and technologies in order to achieve long-term stability of agricultural production, environmental protection and consumer security. Sustainable agriculture can be achieved through management strategies that assist the producers in selecting hybrids and varieties, soil conservation practices, biodiversity conservation, and pest management systems. In other words, the purpose of digital agriculture is to minimize the negative impact on the environment by producing a stable level of production and profit. The objective of this research is to analyze the state of affairs of the agricultural sector in the Republic of Moldova and to examine digital technologies as effective solutions for the sustainable development of the agriculture.*

Key words: *Precision farming, Smart agriculture, sustainable development, simulation models, tele-detection, Information Systems for data collection and processing (GPS), System Decision Support.*
JEL Classification: *R11.*

1. Introduction

Humankind lives and develops progressively in the presence and with the help of information technologies. In the evolution towards the "Gigabit Society" of the next decade, the challenges that we have to face are great: the development of human capital, the integration of digital technologies in business and the public services sector are the main priorities.

The growth of the world population, according to the European Commission estimates, will determine an increase of food demand by 70% towards 2050. Another persistent challenge is to meet the demand for healthy foods and with an optimal food supply for the consumption needs of the population.

The increasing lack of availability of agricultural land, ecological losses and environmental degradation, water shortage, growing needs for energy, as well as the emergence of new harmful organisms and new diseases exert considerable pressure on the environment, and for farmers it is more and more difficult to produce food in a sustainable way.

Digital technologies constitute the future of agriculture, and the attempts to ignore them are preventing the development of this sector.

The Internet of Things, Robotics, Artificial Intelligence and large volumes of data are applied by farmers around the world and make an essential contribution to streamline the processes efficiency.

Technological innovation in agriculture represents an essential part of the solution. Agricultural technologies, in particular, have the potential to increase the productivity and sustainability of agriculture. Research in the field considers digital technology – the only realistic way to meet current challenges.

Worldwide, about 805 million people suffer from chronic malnutrition. Although global food and ecological security concerns have recently brought public sector research and development into focus, the agriculture is still lagging behind.

The digitization of agriculture improves the working conditions for farmers, reduces the negative impact of agriculture on the environment, but also ensures a much higher profitability of the enterprise.

Digital agriculture will take the place of the traditional one, with producers realizing that by investing in technology, they can achieve efficient results, such as saving planting material, fertilizers, herbicides, pesticides and fuels.

2. Material and analysis method

In order to carry out research in the field of implementing information technologies in the agricultural sector, the data of the National Bureau of Statistics, the National Strategy for Agricultural and Rural Development 2014-2020 of the Republic of Moldova, the reports of the Agency for Interventions and Payments in Agriculture, the data provided by the Ministry of Agriculture, Regional Development and Environment were examined. The data from the financial statements and the experience offered by the agricultural enterprises and associations from the Northern region of the Republic of Moldova were examined. Also, the advantages of IT implementation in agriculture have been generalized by studying the European and international practice.

3. Analysis of the agri-food sector

The large flow of foreign investments in recent years in the field of automotive industry development, currently this industry holds a 3% share of the national economy, and the rapid growth of fiber and cable production (43% in 2019 compared to 2018) has not changed the vector of the development of the country's economy, oriented towards the development of agriculture and agri-food production. Agriculture remains an important sector in the economy of the Republic of Moldova, although its contribution to GDP (gross domestic product) is in a continuous decline.

Thus, according to the data of the National Bureau of Statistics in 2015, the contribution of agriculture to the formation of GDP constituted 12.1%, compared to those over 30% registered a decade ago, and in 2018 this share constituted only 10.2%.

The negative dynamics of global agricultural production in GDP was determined by the development of the service sector. This trend is observed in developing countries, where the service sector plays an increasingly important role in the national economy, and the agricultural sector is in decline.

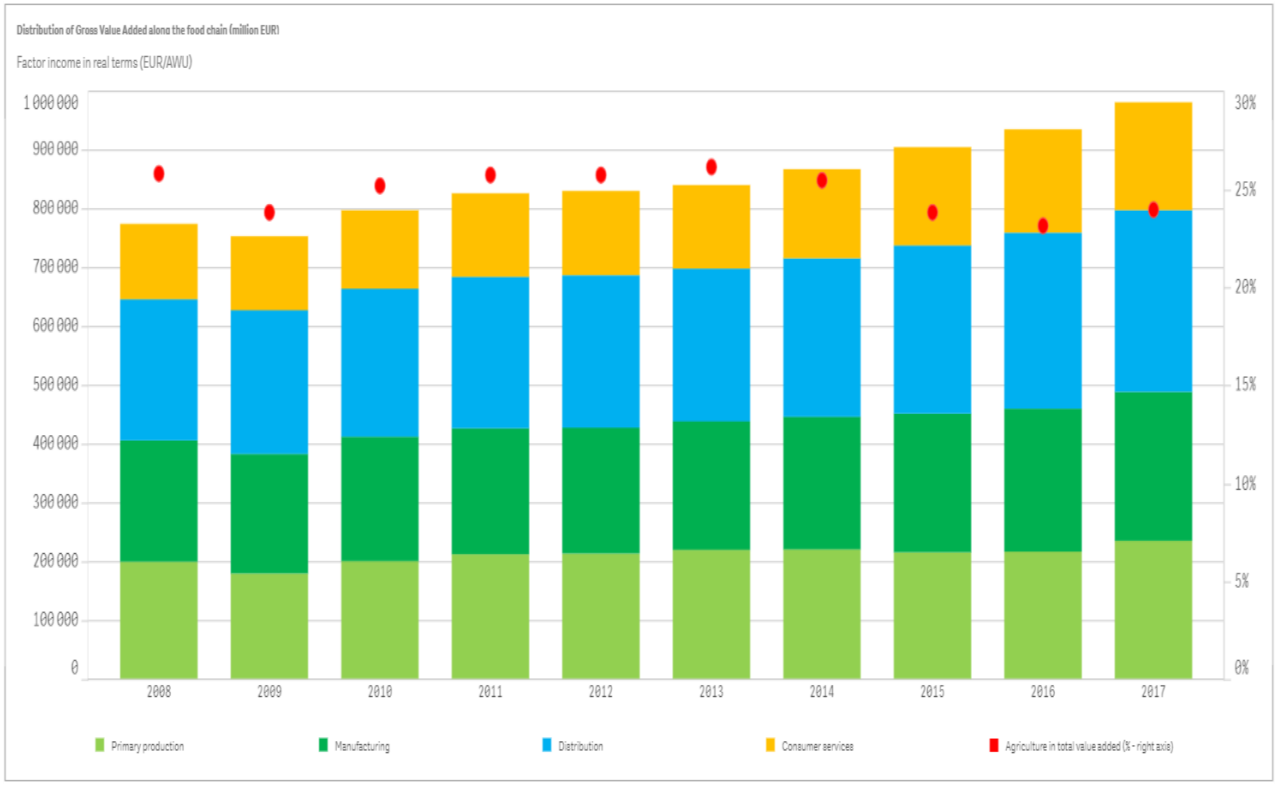
According to the data of the *Eurostat* portal, the gross added value from agriculture by economic branches in the European Union entirely is decreasing in 2017 (23% of GDP) compared to 2010 (28%). At the same time, agriculture plays a vital role in the Eastern European economies, its contribution accounting for about 10% of GDP in the last decade. In this regard, it is important to mention the gap between different areas of Europe, where, in 2018, the contribution of agriculture to GDP was 10% in Eastern Europe and 28% in the European Union.

The employment rate in Moldovan agriculture is still important, but it also registers a decline, both in absolute terms and in relative terms.

In 2019 the economically active population of the Republic of Moldova constituted 1,407 million people, increasing by 7.6% compared to 2018, and the share of economically active persons from the rural area was higher than that of the urban area: 58.6% correspondingly and 41.4%, according to data presented by the National Bureau of Statistics (NBS).

From the distribution of the employed persons by economic activities follows that in the agricultural sector 556 thousand persons worked or 40.4% of the total employed persons. Of these, 51% constitutes the individuals employed with the production of agricultural products, exclusively for their own consumption.

Chart nr.1 Gross added value from agriculture by economic branches



Source: EUROSTAT 2017, https://agridata.ec.europa.eu/extensions/DashboardIndicators/AddingValue.html

As far as the Republic of Moldova is concerned, the employment rate in agriculture has decreased by almost half in a decade, but compared to other regions of Europe, it is still high.

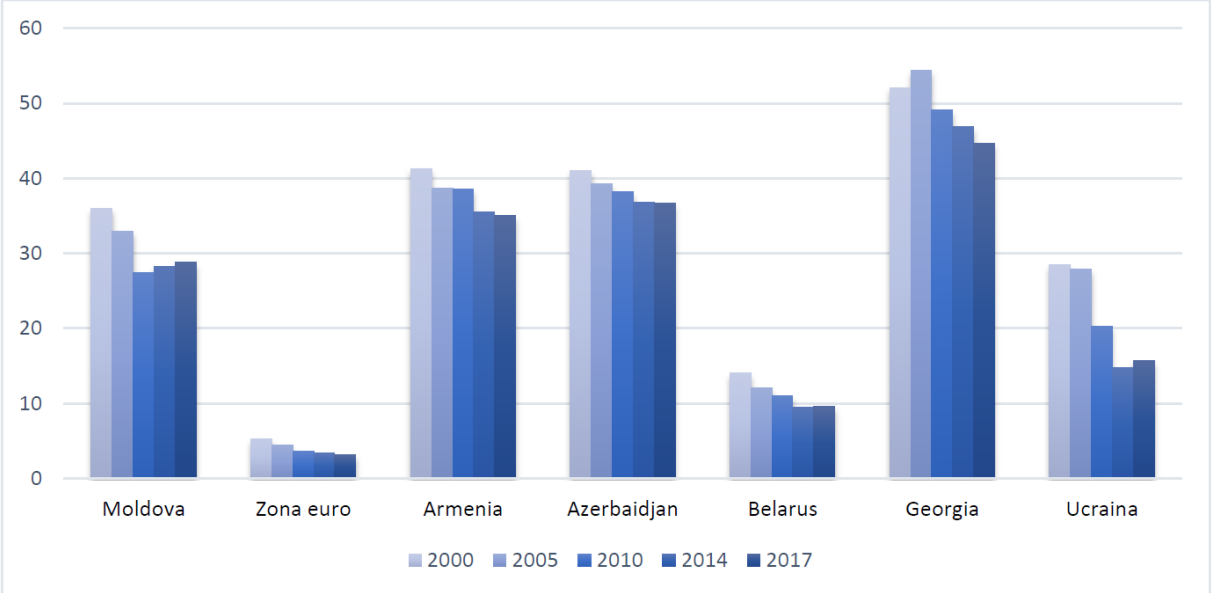
Rapid structural changes in the country's economy have led to the emergence of new employment opportunities in sectors other than agriculture, thus conditioning the migration of population from rural areas and employment in other industries, which are not traditional for the national economy. Although the rate of employment in agriculture is declining, the agricultural sector continues to play an important socio-economic role. Obviously, agriculture remains one of the most important employers in the economy. The decrease of the employment rate in agriculture together with the increase of the production of the sector led to the increase of the labor productivity in the agriculture of the Republic of Moldova. However, compared to other countries in the region, the index remains at a significantly low level.

In Eastern Europe, the employment rate in agriculture continues to be high, but is declining. While in the EU about 3% of the working population is employed in agriculture, in the countries of the former Soviet Union from this region, the employment rate in agriculture in 2017 was 30% (Chart nr. 2). In the case of the Republic of Moldova, the employment rate in agriculture has decreased by almost half in a decade, but compared to other regions of Europe, it is still high.

The agricultural sector of the Republic of Moldova is dominated by vegetable production, while the zootechnical sector plays a less important, but stable, role in production, which suggests a potentially low level of competitiveness. In the years 2000-2017, the crop production accounted for 60-70% of total agricultural production, being largely represented by the raw material exported in bulk to the CIS and the EU.

According to statistical data, 8% of US farmers are processing about 65% of tillable land, and in Europe 5% of farmers are processing more than half of the land. This is achieved through automation. The digitization makes it possible to remotely measure the state of the soil, ensures a better water management of the entire farm and a better crop monitoring using phones, tablets, field sensors, drones and satellites at hand.

Chart nr. 2. Employment in agriculture as a share of total employment in EU countries and some Eastern European countries, 2000–2017 (%)



Source: Eurostat (2018)

In addition, digitization can improve the working conditions for farmers and reduce the negative impact of agriculture on the environment. At the same time, the flows of improved agricultural data throughout the agri-food chain generate many benefits for those involved, including farmers and other stakeholders from the distribution and retail sector.

Agriculture can make many contributions to the economic growth. It may have a contribution to smart, sustainable growth, favorable to the inclusion. We cannot talk about a rational and efficient use of natural resources without thinking about agriculture and the way it is managed.

4. Considerations regarding the implementation of IT technologies for the development of the agricultural sector

In the specialized literature two new concepts are formulated "Precision agriculture" and "Smart Farming".

Therefore, precision agriculture, which originated at the beginning of the 90's of the last century, with the advent of the geographical positioning systems (GPS), is inscribed as a new methodology (a new agricultural system), which could be the key to solving many current problems. This agricultural methodology aims to optimize the use of soil, water and chemical inputs resources (fertilizers and pesticides) on specific local bases. Its basic objectives being the following:

- obtaining large quantities and quality products;
- optimizing the economic profits;
- carrying out the integrated protection of the environment;

- increasing the sustainability of agricultural systems.

Precision agriculture constitutes the use of information and communication technologies, together with the best agricultural practices for the acquisition, transmission and processing of large amounts of data from agricultural fields in order to increase productivity and environmental protection (Hopkins, 2015, p. 28).

The emergence and development of precision agriculture was favored by a number of factors such as:

- the ability to understand the complexity of agricultural systems (systemic and holistic approach);
- the ability to monitor phenomena and processes (automation of data acquisition);
- the achievements in computing techniques (hardware, software and databases);
- the improvement of the calculation and interpretation methods (statistics, modeling, simulation, decision support systems);
- the development of geographical information systems (GIS);
- the emergence and development of the analysis of spatial statistics (geo-statistics);
- the progress in space techniques (tele-detection, GPS);
- the technical achievements in agricultural machinery improvement (VRT).

In the Republic of Moldova, the promotion of precision agriculture is justified by the following hazards pointed out by the agricultural associations and farmers:

1. Use of plant varieties not adapted to the specific conditions of our country
2. Elimination of the specialized units in plant culture
3. Deregulation of the national seed production system
4. Use, by private producers, in a significant proportion, of non-certified seed material
5. High level of prices for agricultural inputs (fertilizers, pesticides, fuels, equipment, agricultural equipment, high bank interest rates)
6. The producers do not finance the culture for economically optimal productions
7. The recent climate change in our country
8. Disregarding the spatial variation of climate and soil resources in agricultural crop zoning
9. Passing the crop culture, in a proportion of 94%, to non-specialized private producers

The use of geospatial and information technologies allows the fields, their productivity and populations of pests to be properly assessed and mapped. These possibilities offer essential advantages in scientific research and the implementation of results.

Precision management in agriculture (precision agriculture) includes the use of three basic elements:

a. Simulation Models, Decision Support Systems and the Geographic Information System (GIS)

A Geographic Information System (GIS) consists of data and computer programs intended for spatial analysis. This system is particularly used to create, store, analyze and process spatially distributed information through a computerized process. The GIS technology can be used in various scientific fields such as: the resource management, environmental impact studies, mapping, route planning.

In the case of Precision Agriculture, the computer programs are intended to obtain results regarding the size and quality of the crop and the factors that affect the development of the plants. These factors include the soil fertility, the disease control, the pests and weeds control, the precipitation distribution, the temperature, the altitude etc. Furthermore,

the GIS technology ensures the planning of the actions necessary to eliminate the factors that may limit the use, number or quantity of chemical materials in agriculture, first of all, of pesticides, by preventing their use, when it is not needed.

b. Tele-detection (TD) and Information Systems for Data Collection and Processing (GPS)

Tele-detection images have been identified as the most appropriate data sources for Precision Agriculture requirements. TD is an observation on a non-contact object. It consists of the measurement and recording of the electromagnetic energy, which is reflected from the surface of the earth, using the sensors attached to airplanes or satellites. The identification of the information regarding the state of the atmosphere is made based on the observations obtained from the sensors. Usually, the digital data is further analyzed using specialized software (Gameda, Dumanski and Acton, 2007, p. 38).

The research carried out in recent years has shown that the Global Positioning System (GPS) best meets the needs of Precision Agriculture in terms of capabilities, price and economic effect. GPS is a location system that provides extremely accurate data for any point on the planet, at any time or weather conditions. The Global Positioning System is a set of global radio navigation based on a set of 24 high altitude orbital satellites.

Nowadays, most of the agricultural land is manually tested, farmers manually collect samples from the pre-set locations, which are sent to the laboratories for analysis. Then, the agronomist engineer creates an appropriate map of the fertilizers recommended for each area designed to optimize the production. Afterwards, a GPS fertilizer distributor applies the selected amount of nutrients to each location.

c. Decision Support System (DSS)

The management of agricultural land today means the management of the sustainable use of the land, and the sustainable use must solve problems of productivity, security, protection of the potential of the land and prevention of the degradation of the quality of the land and the environment, (economic) viability and(social) acceptability (Vlad, 2001, p. 4).

A Decision Support System is a computer tool (a computer program and database system) that supports the decision-making activity in poorly-structured problems, in which it is not possible, for a fully automated system, to carry out the entire decision-making process.

Precision agriculture refers to the "differential" approach of the field versus the "uniform" approach on which traditional management systems in agriculture are based. The precision management of agricultural lands takes into account the natural, specific variation of the soils and not their administrative division.

Therefore, based on the above, we can conclude that precision agriculture:

1. ensures the strategy of sustainable development in agriculture;
2. uses geospatial and information technologies in order to use the specific data of the given place in the direction of making decisions related to agricultural production;
3. presents a set of modern technologies for a sustainable agriculture.

Precision agriculture constitutes a management approach for the entire household, using the information technology, the positioning data (GNSS), the tele-detection and close data collection. These technologies aim to optimize the efficiency of inputs while reducing their negative impact on the environment.

The measurement of the different working parameters by sensors, the analysis of the information received through the specific software and the sending of orders for the modification of other parameters on tractors and agricultural machines created the "Smart farming" system.

For the Republic of Moldova this is a new technology of soil processing, which is used only by some agricultural enterprises for some years.

According to the experts in the field, the economic effect of the technologies of precision agriculture, would be: the reduction of the expenses by minimum 10% -15% and the increase of the productivity in adverse weather conditions of the season by 20-25% (Timofti, 2020, p. 4).

With the use of GPS, the application, development and extension of the *E-Agriculture* concept becomes more and more modern, this being a relatively new term used in the field of agriculture. The concept of *E-Agriculture* describes an emerging domain focused on consolidating this field through the best communication and information processes. E-Agriculture is a smart investment in the agricultural sector, using the ICT domain. This will allow the modification and improvement of the sanitary-veterinary, phytosanitary and food sectors, both at operational level and at managerial level, acting directly and indirectly for the benefit of farmers and the business environment in the agricultural sector.

The aim of *E-Agriculture* is:

- streamlining the development and implementation of sectoral policies;
- focused subsidization;
- optimizing the farmers' activity by digitizing the public services;
- monitoring the sectoral policies.

Agricultural producers, practicing such a kind of agriculture, have modern management technologies that provide them with real-time detailed information on the crops they manage.

These management systems provide considerable financial benefits to farmers as well as significant environmental benefits, including reversing soil degradation, reducing river pollution, increasing carbon sequestration, and reducing greenhouse gas emissions (Hedley, 2015, p. 17).

Based on the analysis of the experience of several countries, the stages of implementation of precision agriculture can be:

1. Use of the concept of specific local management in agriculture. Accepting the condition, that the fields, other management units, which were considered as an integrated unit, further must be divided into smaller units (plots), homogeneous, which will be processed according to the individual needs.

2. Definition of small units. Highlighting the particularities, based on which the fields can be divided into smaller units. Topography and the soil type can serve as a basis for the subdivisions. Field mapping according to the requirements of precision agriculture.

3. Obtaining information on the productivity of small field units. Most important is the size and quality of the crop for each plot. Harvest mapping.

4. Identification of restriction factors. The analysis of each plot on the main factors that influence the size and the quality of the crop. By superimposing the obtained maps, you will get a performance map, which can detect under what conditions the worst results will be obtained.

5. Appropriate response. Applying corrected actions only as required.

6. Evaluation of results. Economic and ecological effect of applying the elements of Precision Agriculture (Hopkins, 2015, p.13).

Increasing the productivity of agriculture through process mechanization and technical management have become important factors in maintaining the balance between the production of agricultural products and the needs of the population. At the same time, the application of nutrients and combating harmful organisms will continue to be a critical link between the production of food resources and the sustainability of agriculture.

Coupled with the needs of increasing productivity, farmers are forced to produce more food products with minimal effect on the environment, in parallel with reducing the application of polluting substances. Farmers face the dilemma of raising productivity and, at the same time, reducing costs and ensuring the protection of the environment.

In this context, the strategic activities at the country level must be coordinated in the aspect of agricultural land resource management, land use planning, including evaluation and interpretation of soil information, land use, integral with agroclimatic resources, crop needs and other environmental factors, which influences the production potential, in order to determine the limits and the potential of agricultural production.

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HIGHLIGHTS, CONCEPTS AND METHODS IN ADDRESSING THE SHADOW ECONOMY: THEORETICAL APPROACH AND SOME COUNTRIES' EXPERIENCE

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Abstract: *From ancient times the shadow economy has always found various ways and means to have its presence in any national economy in various forms. The development of this phenomenon leads to an economic activity parallel to the official one, which will eventually lead to the loss of control of the state authorities. The paper aims to make a general analysis of the theoretical aspects of shadow economy, being focused on concept approach, methodology of evaluation, as well as presentation of some countries' experience in assessing the shadow economy. Taking into account that the paper has a pronounced theoretical character, the research methods are mainly focused on bibliographic research of foreign and local articles of scholars who dedicated their work to assessing the shadow economy. At the same time, a series of other scientific research methods have been used such as: the logical-abstract method, the method of comparison, the monographic method, etc. The main results are focused on development of an own definition of shadow economy by the authors and assessment of evaluation methods through their advantages and limits.*

Keywords: *shadow economy, methods and models for measuring the shadow economy, assessment of shadow economy.*
JEL classification: *O17, B41.*

1. Introduction

In the contemporary era, the shadow economy represents a real threat both globally and nationally. It has a particular impact on all the economic phenomena and processes taking place in society, starting with the economic growth and sustainable development of the country, but also on investments, trade, entrepreneurship, etc.

Taking into account that most of countries are dealing with this phenomenon, it is becoming increasingly important to study the factual features of shadow economy, emphasizing the methods used for its assessment and how accurate they are. Therefore, the paper aims to make a general analysis of the theoretical aspects of shadow economy, being focused on concept approach, methodology of evaluation, as well as presentation of some countries' experience in assessing the shadow economy.

After the collapse of the USSR and the declaration of independence, the Republic of Moldova underwent a complex transition to a market economy. The economic crisis of that period materialized in the development of the phenomenon of the shadow economy. The need for its study results from the amplification of the effects and impact on the national budget, as well as on social life, welfare, political system, education, health system, etc. In order to carry out a reliable study and make an applied analysis, there is needed for existence of a theoretical background in order to tackle this phenomenon more accurate and to make a theoretical background for future research.

It should also be noted that the analysis of this phenomenon in most cases provides estimates and can not be performed with a great accuracy.

2. Degree of scientific approach of the topic in specialized literature

A particular interest in the assessment of the shadow economy is observed in the research of scholars from abroad, such as Schneider F., Williams C. (2013), Cobham A.

(2005), Tanzi V. (1999), Feige E. (1994), Thomas J. (1999), Schneider F., Enste D. (2000), Fleming M. (2000) and others. An important feature of studying this phenomenon is the fact that the above-mentioned authors do not only summarize the theoretical research of the phenomenon at the level of conceptualization or description of its research methodology, but are directly involved in the analysis and assessment of the shadow economy.

Generally speaking, shadow economy represents a phenomenon which is difficult to be defined, as it implies a series of components and dimensions that can vary depending on the region or country. The history of shadow economy lies back in the past. It is believed that the shadow economy emerged simultaneously with commodity and commodity-money relations. Prior to the formation of national legal systems, a major restriction of unfair business practices was a tribal moral or religious morality. Ethical standards were formed mainly on the basis of religious principles. Although the studies on the shadow economy have been going on for several decades ago, economists have still not formed a unified conceptual framework for its analysis. Most authors, who tried to assess the shadow economy, are still facing the difficulty of producing a precise definition of the phenomenon (Caurkubule, Rubanovskis, 2014).

In the specialized literature, shadow economy can be found under different approaches and notions, such as: ***underground, informal, grey, illicit, parallel, hidden economy, etc***. There are various opinions on the difference and similarities among these definitions, but most of the scholars agree that they represent, basically, a part of the economy that is not found in the legal evidence - the shadow economy. Respectively, in this research, the authors address the concept of shadow economy as an eminent and risky one for countries with economies in transition.

3. Research methods

Taking into account that the paper has a pronounced theoretical character, the research methods ae mainly focused on bibliographic research of foreign and local articles of scholars who dedicated their work to assessing the shadow economy. At the same time, a series of other scientific research methods have been used such as: the logical-abstract method, the method of comparison, the monographic method, etc. All of them allowed to make a synthesis of the current state of play in the field of theoretical study of the shadow economy phenomenon.

4. Conceptualization of the shadow economy phenomenon

4.1. Defining shadow economy

Defining the shadow economy aims at a better understanding of its components and causes. Several scholars and international organizations defined this concept according to their observations and research. Thus, according to Feige, the shadow economy consists of all currently unregistered economic activities that would contribute to the officially calculated gross national product, if they were registered (Feige, 1994).

As Vito Tanzi remarks, exist at least two definitions of the shadow economy. The first, is connected to the production missed in the official statistics; the other, refers to "…revenue not reported to, and not discovered by, the tax authorities" (Tanzi, 1999).

According to Fleming et al. (2000), it is possible to distinguish two approaches, in defining hidden economy:

-The definitional approach, which considers it as simply unrecorded economic activities. Thomas (1999) notes that "it is difficult to provide a formal definition" of the shadow economy and suggests that it covers those activities which are not recorded in the national income accounts; Schneider and Eneste (2000) define the shadow economy in a

similar manner as all economic activities which contribute to the officially calculated (or observed) gross national product;

- The alternative approach finds that shadow economic activities are best defined with respect to the particular behavioural characteristics of the activities in question carried out by the economic agent.

Schneider and Williams offer a wider definition, by defining it as including all market-based production of only legal goods and services that are deliberately concealed from public authorities for the following reasons: to avoid payment of income, VAT or other taxes; to avoid paying social security contributions; to avoid having to meet certain legal labor market standards, such as minimum wages, maximum working hours; to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms (Schneider, Williams, 2013).

Smith defines the underground economy as the portion of the total economy that is unobserved due to the efforts of some businesses and households to keep their activities undetected. At the same time, he gives several alternative definitions to this phenomenon that are somehow connected between them, but differ in components, as follows:

- Market-based production of legal goods and services that escapes detection in the official estimates of GDP;
- Market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP;
- Market-based production of goods and services, whether legal or illegal, that escapes detection by the tax authorities;
- Market- and non-market based production of goods and services, whether legal or illegal, that escapes detection in or is intentionally excluded from the official estimates of GDP (Smith, 1994).

In the current conditions of the Republic of Moldova, the phenomenon of shadow economy has been studied by such researchers as: Costandachi (2012), Budianschi, Lupusor, Fala, Morcotilo (2014), Ganciucov, Gutium (2018), Ceban (2016) and others. However, there is still no unambiguously acceptable concept of the shadowy economy related to the country's realities.

Therefore, under these circumstances, the authors attempt to provide a definition of the shadow economy which is related to the conditions of the Republic of Moldova. Thus, "*Shadow economy represents the total economic activities performed by a natural or legal person that generates advantages, whether executed legally or illegally, and are intended to camouflage the economic results, reduce or totally omit them under the records of the relevant public authorities in order to obtain illicit economic benefits*".

4.2. Components of the shadow economy

In order to better understand the phenomenon of shadow economy, it should be seen through its components. According to Dell'Anno (2003), shadow economy comprises all product activities that can be classified into the following three areas: underground production, informal production and illegal production.

The underground production represents the area of production activities that are not directly observed due to:

a) Economic reasons (the activities carried out with the deliberate desire to avoid taxes, social contributions in the favour of employees or, also, to avoid observing the law provisions concerning minimum wages, the number of work hours, job safety, etc.)

b) Statistical reasons (production activities that are not registered due to:

- The failure to fill out the administrative forms or statistics questionnaires because of the lack of sensitivity to statistics of those asked to fill them out and/or shortcomings in the statistics system;
- The difficulty in grasping the changes of a rapidly evolving productive system, characterised by small productive activities which are often not detectable with the traditional survey techniques.

The informal production refers to productive institutional units characterised by:

a) a low level of organisation;
b) little or no division between work and capital;
c) work relations based on occasional jobs, kinship, or personal relations. (This context comprises the activity of craftsmen, peddlers without licences, farm workers, home workers, and the unregistered activities of small merchants).

The illegal activities are all those oriented to the production of goods and services whose sale, distribution or possession is prohibited by law. Falling within this area are also the productive activities carried out by unauthorised operators. Due to the difficulty of estimation, that could be limited the international comparability, the illegal activities are excluded by the national accounts (Dell'Anno, 2003).

A little bit distinctive components can be found in the work of Budianschi et al (2014), who divide the shadow economy in four components:

- The informal sector - includes all the units that produce legal goods but are not registered or have a number of employees below the established census. As a rule, they are small businesses whose target customers are individuals, they are set up from their own resources, have a low level of organization, and the division of the production factors is not clear.
- Hidden production in the formal sector - all legal productive activities hidden by economic agents in order not to be registered by the administrative and fiscal bodies for the purpose of tax, social insurance contributions evasion, etc. This includes not only the non-registration of certain types of products and services but also the payment of wages in the envelope when the salary is registered with a minimum wage or the number of worked hours is reduced.
- Household production - all goods and services produced and consumed by households themselves for their own needs are not considered as a compartment of the shadow economy. But when households dispose of these goods in excess and start selling them to third parties (relatives, peers, etc.), there is an additional source of income that in most cases is not brought to the attention of public authorities.
- Illegal production - the production of goods and services the sale or distribution of which is contrary to law and is carried out by unauthorized persons. This includes both illegal activities (distribution of drugs, toxic substances, prostitution services) and the production of goods or the provision of services by unauthorized agents (the production of unlicensed alcoholic beverages).

4.3. Causes of the shadow economy

There are a number of factors that cause the economic agents to enter the shadow economy. In order to be able to reduce the effects and combat this phenomenon, it is necessary to identify and understand these factors. As a result of the studied literature (Budianschi, 2014; Arsik et al, 2015; Schneider, 2007), a set of systemic factors has been identified, namely:

- Tax burden, which is a complex system with high rates and fees that causes economic agents to consider them too large and to use tax evasion. Increasing the tax burden makes it more cost-effective to operate in the informal sector. Tax evasion is

typically implemented through several methods, such as unregistered entrepreneurial activity in order to avoid attention from tax authorities, incomplete declaration of goods and services, employee remuneration in the envelope.

- Intensity of regulation represents a legislative complexity and administrative barriers that negatively influence the process of launching and closing a business. Even when managing an enterprise, the fiscal agent is obliged to carry out relations with State Tax Service, Customs Service, National Social Insurance House, National Insurance House in Medicine and local tax services, not only to follow the changes that appear in the Tax Code but also different laws that appear both, at the territorial and national level.
- Taxation morality represents the lack of trust from the citizens and the economic agent in the qualitative provision of public services. It reflects the internal motivation to pay taxes. This result is due to the inefficient functioning of public institutions, the failure to solve important economic problems and the high level of corruption that leads to mistrust in the public system. According to Schneider and Buehn (2007), an increase of the shadow economy can lead to reduced state revenues which in turn reduce the quality and quantity of publicly provided goods and services. Ultimately, this can lead to an increase in the tax rates for firms and individuals in the official sector, quite often combined with a deterioration in the quality of the public goods (such as the public infrastructure) and of the administration, with the consequence of even stronger incentives to participate in the shadow economy.

5. Theoretical approach of assessing shadow economy

Measuring the level of shadow economy has represented a real challenge for a long time for the scholars around the world. Scientists have developed several methods in an attempt to assess the shadow economy in an accurate way, more closely to the reality, but a unanimous accepted method of assessment has not come to an end yet.

Thus, according to Schneider (2012), there are three methods of assessment, which are mostly used:

- Direct procedures at a micro level that aim at determining the size of the shadow economy at one particular point in time. An example is the survey method and tax audit;
- Indirect procedures that make use of macroeconomic indicators in order to proxy the development of the shadow economy over time. They include the gap method of national accounts, the labour force model, physical input method, input – output model, Cobham model, etc.
- Statistical models that use statistical tools to estimate the shadow economy as an "unobserved" variable.

By investigating each of these methodologies for estimating the shadow economy, their description will be further presented below, highlighting their advantages and limitations.

5.1. Direct methods

Direct methods refer mainly to microeconomic approaches that employ either well-designed surveys and samples based on voluntary replies, or tax auditing and other compliance methods.

Sample surveys designed to estimate the shadow economy are widely used. They mainly contribute to determine the unreported employee wages and unreported business income. It may look at the first sight as a simple method of estimation, but the results of the survey, if it has been done appropriately, can be very exhaustive.

Advantages	***Limits***
- Responses are obtained from the first source of information. - Very detailed information can be obtained about the structure of the shadow economy.	- Respondents can hide information about fraudulent behaviour during the survey. - Responses can be difficult to be quantified in monetary values (estimation of losses due to the existing shadow economy). - Results from these kinds of surveys are very sensitive to the way the questionnaire is formulated. - Survey results can be inconsistent at the international level.

Tax audit method is another direct method for estimating the shadow economy. Estimates of the shadow economy can also be based on the discrepancy between income declared for tax purposes and that measured by selective checks. Fiscal auditing programs have been particularly effective in this regard. Since these programs are designed to measure the amount of undeclared taxable income, they may also be used to calculate the size of the shadow economy (Schneider, Buehn, 2016).

Advantages	***Limits***
- Results obtained from tax audit are closer to the real situation. - Results can be quantified in numbers. - Results of tax audit from several enterprises from the same branch can offer a general overview of the level of shadow economy in a certain sector.	- Selection of taxpayers for tax audits is not random but based on properties of submitted (tax) returns that indicate a certain likelihood of tax fraud. Consequently, such a sample is not a random one of the whole population, and estimates of the shadow economy based upon a biased sample may not be accurate. - Estimates based on tax audits reflect only that portion of the shadow economy discovered by income tax authorities, and this is likely to be only a fraction of all hidden income (Schneider, Buehn, 2016).

5.2. Indirect methods

Refer to macroeconomics and are based on a series of economic indicators that can offer a picture about the evolution of shadow economy during a period of time.

The discrepancy between national expenditure and income statistics is based on discrepancies between income and expenditure statistics. In national accounting the income measure of GNP should be equal to the expenditure measure of GNP. Thus, if an independent estimate of the expenditure side of the national accounts is available, the gap between the expenditure measure and the income measure can be used as an indicator of the extent of the shadow economy (Schneider, Buehn, 2016).

Advantages	***Limits***
- Represents a complex model allowing identifying at what stage and what sector is more susceptible to shadow economy.	- Accuracy of the statistical system can be doubted in some countries.

The discrepancy between the official and actual labor force. A decline in participation in the labor force in the official economy can be seen as an indication of

increased activity in the shadow economy. If total labor force participation is assumed to be constant, then a decreasing official rate of participation can be seen as an indicator of increased shadow economic activities (Schneider, Buehn, 2016).

Advantages	***Limits***
- Represents a very good method if used in combination with other indirect and/or statistical methods. - Allows some forecasts for the future: if the number of employees increases, then production should also increase (only if qualifications of workers remain the same).	- Differences in the rate of participation may have other causes. - A part of people can work in the shadow economy and have a job in the official economy.

The physical input (electricity consumption) method. In order to measure the overall economic activity in an economy, Kaufmann and Kaliberda (1996) assume that electric power consumption is regarded as the single best physical indicator of overall (or official plus unofficial) economic activity. Thus, growth of total electricity consumption is an indicator for growth of overall GDP, either official or unofficial.

Advantages	***Limits***
- Simplicity of the method. - Precision of this method can be increased in combination with observation of indicators related to gas consumption, water, coal, etc.	- Not all shadow economy activities require a considerable amount of electricity (e.g. personal services), and other energy sources can be used (gas, oil, coal, etc.). - Over time, there has been considerable technical progress so that both the production and use of electricity are more efficient than in the past, and this will apply in both official and unofficial uses (Schneider, Buehn, 2016).

The input-output model was developed by Wassily Leontief and is used to describe and analyze economic relations between industries and allocation of resources. The fundamental information used in input–output analysis concerns the flows of products from each industrial sector, considered as a producer, to each of the sectors, itself and others, considered as consumers (Miller, Blair, 2009).

	Intermediate consumption	Final consumption
Intermediate product	I	II
Gross value added, import, net taxes	III	IV

The simplified model takes the shape of a dial. Data in natural values from the 4 dials can explain the difference between resources and consumption, which helps to identify the shadow economy.

Advantages	***Limits***
- Use of the natural values allows ignoring such factors as monetary values, inflation, etc. - Can be used both, at	- There may be a margin of error due to the fact that the services are not included. - Is based on statistical data which can not always be accurate.

macro and micro level of the economy.	- If the analysis is carried out for a longer period of time, technological developments within enterprises must be taken into account.

A simple model of tax (Cobham, 2005). This method involves calculations for each type of tax and shows the difference between the potential taxes that could be collected and the losses that took place. The formula looks like this:

$$T_0 = tY \quad (1)$$

where: T_0 represent the potential taxes that could have been collected

t - the tax rate that is tax dependent.

Y - Income to be taxed specifically with this tax.

In such a case, the real value of tax will be expressed through the following formula:

$$T_1 = t_c[Y(1\text{-}s)\text{-}h\text{-}p]\text{-}U \quad (2)$$

where: T_1- the amount of the tax received by the tax authorities

t_c - tax competition, taxes after negotiations with local authorities.

Y - Amount of income to be taxed.

s - the share of the shadow economy as a result of the activity of informal sector, the hidden production in the formal sector, the production of domestic households for self-consumption and the illegal production.

h - accumulated income in assets held in offshore areas.

p- corporate profits, which are moved to other jurisdictions if lower tax rates are applied.

U - the sum of taxes not paid each year, which represents the payments that must be paid by the economic agents, but for various reasons are not paid.

Advantages	***Limits***
- Can present quite accurate the real volume of taxes that a state can receive.	- Concerns only the tax issues, which makes is limited.

The main **statistical method** of assessing the shadow economy to be studied is the *MIMIC model*, defined as multiple indicators-multiple causes. The method has its origins in the literature of factor analysis of psychometrics. In the first application of MIMIC method for estimation of the gray economy, data collected from 17 OECD countries has been reviewed (Trebicka, 2014).

The MIMIC model explains the relationship between observable variables and an unobservable variable by minimizing the distance between the sample covariance matrix and the covariance matrix predicted by the model. The observable variables are divided into causes of the latent variable and its indicators. Formally, the MIMIC model consists of two parts: the structural equation model and the measurement model (Buehn, Schneider, 2008).

Figure no. 1. The MIMIC model for assessing shadow economy

Source: Buehn, Schneider, 2013

In order to evaluate the shadow economy, a set of causes and a set of indicators are assumed, which are influenced by the size of the shadow economy, thus being found the structural dependence of the shadow economy on these variables. The interaction, over time, between the causes Z_{it}(i=1,2,..,k), the size of the underground economy X_t and the indicators Y_{jt}(j=1,2,…,p) is shown in Fig. 1. This dependency helps us to forecast changes in the size of the shadow economy in the future.

Advantages	***Limits***
- Makes the difference between causes and indicators. - Considers various causes and effects at the same time when estimating shadow economy.	- MIMIC model estimations lead to unstable coefficients in the face of minor changes in either the data period or the group of countries studied. - The lists of causal and indicator variables are unconvincing, sometimes. - The relevance of casual and indicators variables is also questioned, sometimes. - Only relative coefficients (no absolute values) are obtained. - There are difficulties in differentiating between the selection of causes and indicators

6. Some countries' experience in assessing the shadow economy

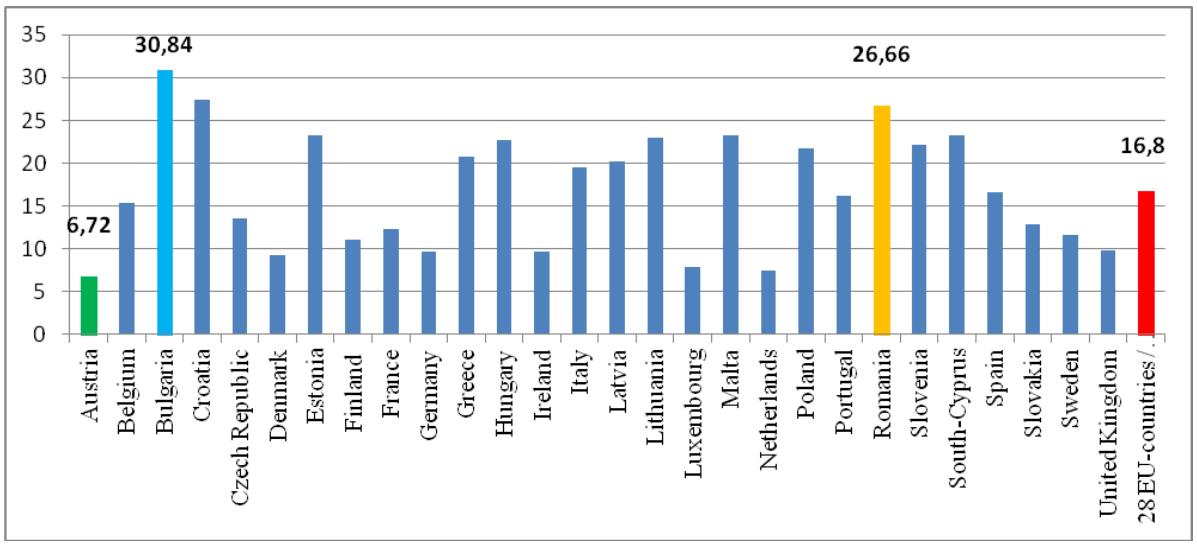
European Union represents an important actor on the international arena, from the economic point of view, as well as regarding the social aspect. The socio-economic development of the EU is hindered by the presence of the shadow economy in every member state, but at a different extent. In order to reduce the size of this phenomenon, economic, fiscal and institutional approaches appear as basic tools in the redefinition of the quantitative and qualitative coordinates of a transparent and efficient economy (Tudose, Clipa 2016).

According to the most recent researches in the field carried out by Schneider (2019), the shadow economy in EU countries has been estimated with the help of the MIMIC model for a large period of time - 2003 – 2018. The MIMIC approach explains the relationship between observable variables and an unobservable variable by minimizing the distance between the sample covariance matrix and the covariance matrix predicted by the model. The observable variables are divided into causes of the latent variable and its indicators. Formally, the MIMIC model consists of two parts: the structural equation model and the measurement model (Buehn, Schneider, 2008). At the moment, taking into account that a very accurate model of assessing the size of shadow economy still does not exist,

most of the European researchers use the MIMIC model, which according to its components, represents the most reliable way of evaluation.

Analysing the existing data, some trends in the development of shadow economy can be noted. First of all, all EU member states countries succeeded to diminish the percent of shadow economy in GDP. Thus, these figures vary between 9.8% (Luxembourg) and 35.9% (Bulgaria) in 2003 and between 6.72% (Austria) and 30.84% (Bulgaria) in 2018. The most valuable results can be noted in case of Baltic States, where Latvia during 2003 – 2018 reduced the shadow economy as % of GDP with 10.2%, Lithuania – with 9% and Estonia with 7.5%. The average share of shadow economy of EU 28 states as % of GDP decreased from 22.6% in 2003 to 16.8% in 2018. At the same time, there are states like Bulgaria, Croatia and Romania where the size of the shadow economy reaches almost one third of GDP, while in such countries like Austria, Denmark, Germany, Ireland, Luxembourg, Netherlands and United Kingdom it accounts for less than 10% see Figure 1). The geographical distribution of the high and low shares of shadow economy is also worth to be mentioned, as the Eastern and Central Europe countries have higher values of shadow economy, while the Western European countries – have the lowest ones. This fact can be also explained due to the only recent integration of Eastern and Central European countries in the EU, compared to the older member states. At the same time, the level of shadow economy in Northern countries (Denmark, Finland and Ireland) is lower than the one in the Southern part of the continent (Greece, Italy, Malta and Spain).

Figure no. 2. Size of the shadow economy in the EU member states in 2018, % of official GDP



Source: developed by author based on Schneider (2019)

Shadow economy in Romania

Romania has very good practices in measuring the shadow economy, mainly due to the fact that it is a member state of the EU, which allows for a permanent calculation of the indicator of unobserved economy, and at the same time, due to the available statistical data and their incorporation in different models, allowing the measurements to be done in a relatively accurate manner.

Since 2000, several studies have been carried out in order to estimate the shadow economy in Romania, by using different approaches and methods. A compilation of the

main attempts to assess the shadow economy has been done by Popescu, Davidescu and Huidumac (2018) and is presented below in a form of a table.

Table 1. The size of the Romanian shadow economy, % of official GDP

Authors	Approach	Size of shadow economy
Albu Albu et al.	Income discrepancy method	21.7–22.3% (2000) 20.6–21.2% (2001) 20.2–20.7% (2002) 19.3–19.6% (2003) 17.6–17.6% (2004) 17.2–17.3% (2005) 16.3–16.5% (2006) 14.6–15.0% (2007)
National Institute of Statistics	Labour input method	18.1% (2000) 15.4% (2003) 16.6% (2005) 20.0% (2007) 21.3% (2009) 23.5% (2010)
Andrei, Stefănescu, Oancea	Monetary method	25–35% (2000–2009)
Schneider, Buehn and Montenegro Medina and Schneider	The MIMIC approach	34.4% (2000) 30.5% (2005) 26.8% (2010) 29.1% (2012) 24.0% (2013) 28.0% (2015) 27.6% (2016)
Alexandru and Dobre	Currency demand approach Vector Error Correction Models (VECM)	36.5% (2000) 34.23% (2003) 33.6% (2005) 32.1% (2008) 31.6% (2010)

Source: Popescu, Davidescu, Huidumac (2018)

After analysing the approaches used to measure the shadow economy in Romania, there can be noted discrepancies among the outcomes of the different approaches. Thus, the Currency demand approach and Vector Error Correction Models give the highest shares of shadow economy in GDP (32,1% in 2008), while the income discrepancy method presents relatively lower data of about 15% in 2007. It is worth mentioning that data after 2010 is available only from the MIMIC model.

The size of the shadow economy, together with estimations of tax evasion has been analysed in Romania for the period 2000–2017 by Dell'Anno and Davidescu (2019). The MIMIC model has been used for the estimation of the size of the shadow economy, while the currency demand approach was tackled for the assessment of tax evasion.

The most recent valuable research has been done by Popescu, Davidescu and Huidumac (2018), who have combined several methods such as surveys and MIMIC model. A random stratified sampling has been used in order to assure the national representativeness for companies with more than five employees, while 420 respondents were interviewed based on the computer-assisted web interviewing (CAWI) method. The questionnaire contained information related to the firms' attitudes regarding the level of

satisfaction with the National Agency for Fiscal Administration, the government's tax policy, business legislation, tax evasion, bribery, government aid for entrepreneurs, tax morale, opportunities in the business environment, barriers in the business environment, and the main obstacles in starting a business. All the findings have been incorporated in the MIMIC model, with the main drivers of shadow economy being the unemployment rate, the self-employment rate, part-time employment, and government effectiveness. The shadow economy was reflected in the rise of currency ratio and the labour force participation rate. Thus, according to the researchers, at the beginning of 2000, the size of the shadow economy in Romania registered the value of 34% and followed a declining trend, attaining almost 29.4% by the end of 2008, which was considered the start of the economic crisis in Romania. As a consequence, the shadow economy increased to almost 32.3% in 2010. Until the beginning of 2011, the size of the shadow economy decreased slowly, and was at 27.7% at the end of 2016. From the beginning of 2017, due to the modifications brought to the Labour Code and Fiscal Code, and also due to the political instability and the increasing lack of trust in public officials under the perspective of a future "Tax Revolution" (implying the transfer of contributions from employer to the employee), a reversal of the trend can be highlighted: the size of the shadow economy following an ascendant evolution, registering an increase with more than 1 ppt. in the second quarter of 2017 (28.6% of official GDP) (Popescu, Davidescu, Huidumac, 2018).

Romanian experience in assessing the shadow economy can represent a good practice for the Moldovan researchers, as the most recent methods used are in line with the EU standards of evaluation of this phenomenon. Being a neighbouring country of the Republic of Moldova and due to the existence of common history and language, taking the good practices of Romania would increase the Moldovan researchers' capacities in developing a relatively accurate analysis and forecast of the shadow economy in the Republic of Moldova.

Shadow economy in Ukraine

Assessment of shadow economy in Ukraine has been done by a series of researchers like Vinnychuk and Ziukov (2013) who mentioned that a tendency of reducing the level of shadow economy has been observed in the recent years in Ukraine. The model used in assessing the phenomenon is the legal and shadow economies interaction, which is considered one of the simplest models of functioning of legal and shadow economies. They are connected with the economic structure of society, when it refers to the distribution of citizens, their families, etc., for liquid accumulation (savings) in cash and securities that are convertible into cash quickly. In the simplest case, the aggregate economy that produces a single aggregate social product can be considered. The experiments with the model show that the emergence of the shadow economy slows down the income growth of workers. The delay of this growth reflects the typical economic slowdown, and its duration is directly related to the shadow exchange. The emergence of the shadow sector in transition economies also strongly affects the financial position of highly skilled professionals, for whom there is no employment in the informal labour market. In addition, the experiments with the model show that only a complete economic revitalization reduces the shadow sector (Vinnychuk, Ziukov, 2013).

At the same time, the role of public institutions and NGOs is very obvious in assessing the size of the shadow economy in Ukraine, taking into account that there are considerable differences in terms of outcomes of both types of organizations.

Thus, according to the recent data provided by the Ministry of Economic Development and Trade of Ukraine (2019), shadow economy decreased in size during 2018 and now stands at below 30 per cent of GDP, the lowest figure in 10 years. The made

calculations are based on the model of estimating the size of shadow economy developed within the Ministry. The highest share of shadow economy, 40 per cent, was recorded in the financial services sector, although the figure decreased by 10 per cent compared to 2017. Other notable decreases were recorded in the mining sector (8%), trade (5%) and real estate (4%). At the same time, shadow economy in population expenditure and retail turnover fell by 2% to 46%, while the number of loss making enterprises showed a 4% drop (to 18%).

On the other hand, contradictory data is presented by the Kyiv International Institute of Sociology (2019). Research was carried out based on the survey method and 800 owners and top-managers of companies over all Ukraine except AR Crimea and temporary occupied NGCA of Donetsk and Luhansk oblasts have been interviewed. The main results present that the size of shadow economy in 2018 accounted for 47.2% of the total GDP and 46.8% in 2017. The most shadowed economy sectors are Retail and Construction, where shadow economy outreaches 50%, but despite other sectors, only here the size of the shadow economy decreased from 2017 to 2018. At the same time, analysing the three components of the shadow economy: underreporting of business income, underreporting of real number of employees and underreporting of real value of paid wages, or "Envelope wages", there can be noted that the largest part in the shadow economy in 2017 and 2018 is taken by the unreported business income, though its share has diminished from 60% to 57%. The following one is unreported employees, whose share left without changes during two years 2017 and 2018, while the third component is the smallest among others but in contrast with them, its share grew significantly from 18 % in 2017 up to 21% in 2018.

Thus, Ukrainian example of assessing the size of shadow economy demonstrates that the survey method tends to present higher figures that the statistical ones, as it based not only on statistical data, but also on direct interviews with respondents, which are first source of information and provides data about the structure of the shadow economy. At the same time, it is worth mentioning that results from these kinds of surveys are very sensitive to the way the questionnaire is formulated.

7. Conclusions

Elements of the shadow economy, from ancient times, are present in any type of economic organization and economic activity, in different forms and with a different ratio.

As a result of the researches carried out, one can mention that most authors define the shadow economy almost identical. The difference lies in the complexity of the notion, as well as the specificity of the economy analyzed by the researchers.

Often, the lack of knowledge of the regulatory environment by the economic agent may shift its activity to the informal sector. On the other hand, a good knowledge and manipulation of legislation can cause subjects to resort to tax evasion or illegal evidence.

The estimation of the shadow economy by quantitative methods represents a major, even eminent necessity, both from a practical and scientific point of view.

From an applied point of view, the experts need to know the real potential of the economy, in order to ensure the sustainability and the economic levers to be applied for regulating the economic cycles. The existing shadow economy, on the other hand, greatly diminishes the visible potential of the economy.

From the scientific point of view, the new approaches in estimating the shadow economy are of major interest, and it becomes necessary to adapt them to the development conditions of the countries. At the same time, the research of the tools applied for estimating the shadow economy generates new methods of evaluation and identifies new factors that determine the shadow economy to be a phenomenon present in all countries.

The analysis of the specialized literature that addresses the problem of estimating the shadow economy indicates that there is not yet a precise method of evaluating this phenomenon. Each method analyzed has its own advantages and limitations. Qualitative methods of analysis, such as surveys or fiscal audit, show a fairly good accuracy at the level of the economic agent or maximum at the branch level. Due to the lack of the quantitative part, the results obtained as a result of applying these methods cannot be extrapolated to the level of the entire economy of a country. On the other hand, from a quantitative point of view, the methodology based on statistics, the discrepancy between expenses and incomes, the method of physical inputs, offers some data at the macroeconomic level, but their accuracy is not maximum, due to the existing limitations.

In order to carry out reliable research, while the result to be as close as possible to the real situation in the economic sector, it is often recommended to use several cumulative methods. Also, a series of more in-depth and comprehensive research on the methodology of evaluating the shadow economy is needed.

Despite of the numerous studies and analysis of data as a result of application of different estimation methods, and the difficult process of data quantification, the real dimensions of the shadow economy are still unknown. Being a complex phenomenon, with different components and requiring diverse approaches, it needs a set of measurement methods and instruments of estimating its size, based on relevant data and indicators, but also taking into the account the specificity of each country.

Data referring to shadow economy in EU member states vary significantly and remain a continuous concern for the national governments, public bodies and civil society. In 2018, as % of GDP, figures begin from 6.72% for Austria and end up with 30.84% for Bulgaria. The most developed EU countries have the smallest shares of shadow economy, while the newly integrated nations still have some backlogs in terms of this issue. At the same time, the continuous decrease of this phenomenon in EU countries demonstrates that diminish of the shadow economy is a task that can be achieved. Practices of EU countries in assessing the shadow economy have demonstrated that regardless of the used method, the outcomes are not accurate for 100%, mainly due to the limitations of each method used.

The Ukraine experience also demonstrates that different approaches such survey or econometric model may result in contradictory results.

Thus, based on the lessons learned from the experience of EU and neighbouring countries, the further research of the topic will be focused on fundamentation of the theory and methodology of a model estimating the shadow economy in the Republic of Moldova in the context of financial stability and taking into account the specifics of the country's economy.

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STRUCTURAL INFLENCES AND CIRCULAR BUSINESS MODELS

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Abstract: *The purpose of the presentation of the article is realized or imagined about the whole on the structural influences of the circular economy, the care needed for structural modifications and adaptation. Modifying the business models is the main reason for the care needed to create or have the functions necessary to configure or reconfigure resources for us or for their existence. The article discusses structural differentiation in terms of confidentiality and barriers to integrate into the pieces, and must model in the regime, regulate community placement and redistribute internal resources, for compatibility with requirements and environmental conditions, for the implementation of the circular business model, with large investigations and longer time horizons for generating revenue.*

Keywords*: circular economy, economic growth, sustainable development, markets.*
Classification JEL: *O11, O44, Q53.*

1. Introduction

In a circular economy, the more efficient use of materials allows the creation of a greater value, both through cost savings, as well as by developing new markets or increasing existing ones. These markets can be understood as early-stage business environments, in which economic units offer and compete with a new type of business models based on profits obtained as a result of circularity implementation.

Some economic units have a slow start in the implementation of a circular business model, due to organizational inertia and resistance to this radical transformation.

While managers in economic units that continue with the status quo of the linear model can plan and forecast their future based on historical data, for managers who have implemented the circular business model, there is a limited value of historical data.

The limits of the use of resources, energy and the importance of creating use values in terms of closing the loops are the basis of the reasoning of the circular economy. Changing the entire value chain by initiating a circular business model is based on the theory of resources, which proposes the construction and completion of the resource portfolio of an economic unit, which gives it a lasting advantage.

In this context, the challenge is to establish and organize activities in the reverse value chain, which covers all activities from the return of the product to the potential recovery of the maximum value of the products through recovery and recycling activities.

2. Structural influences

Moving to a circular model can lead to cost savings by reducing waste, better supply chain management, lower sensitivity to resource price volatility, and longer customer relationships.

High investment requirements create entry barriers, which restrict the number of potential collaborators a manufacturer can choose when establishing alliances. Thus, switching to a circular system can lead to high-concentration industrial structures, which means that the industry is dominated by a relatively small number of actors in its early stages.

In highly concentrated industries, it is important for network actors to build and maintain collaborative relationships, because mutual dependencies are significant, because the concentration of a small number of economic units connected through a network of links tends to lead to high industry profitability.

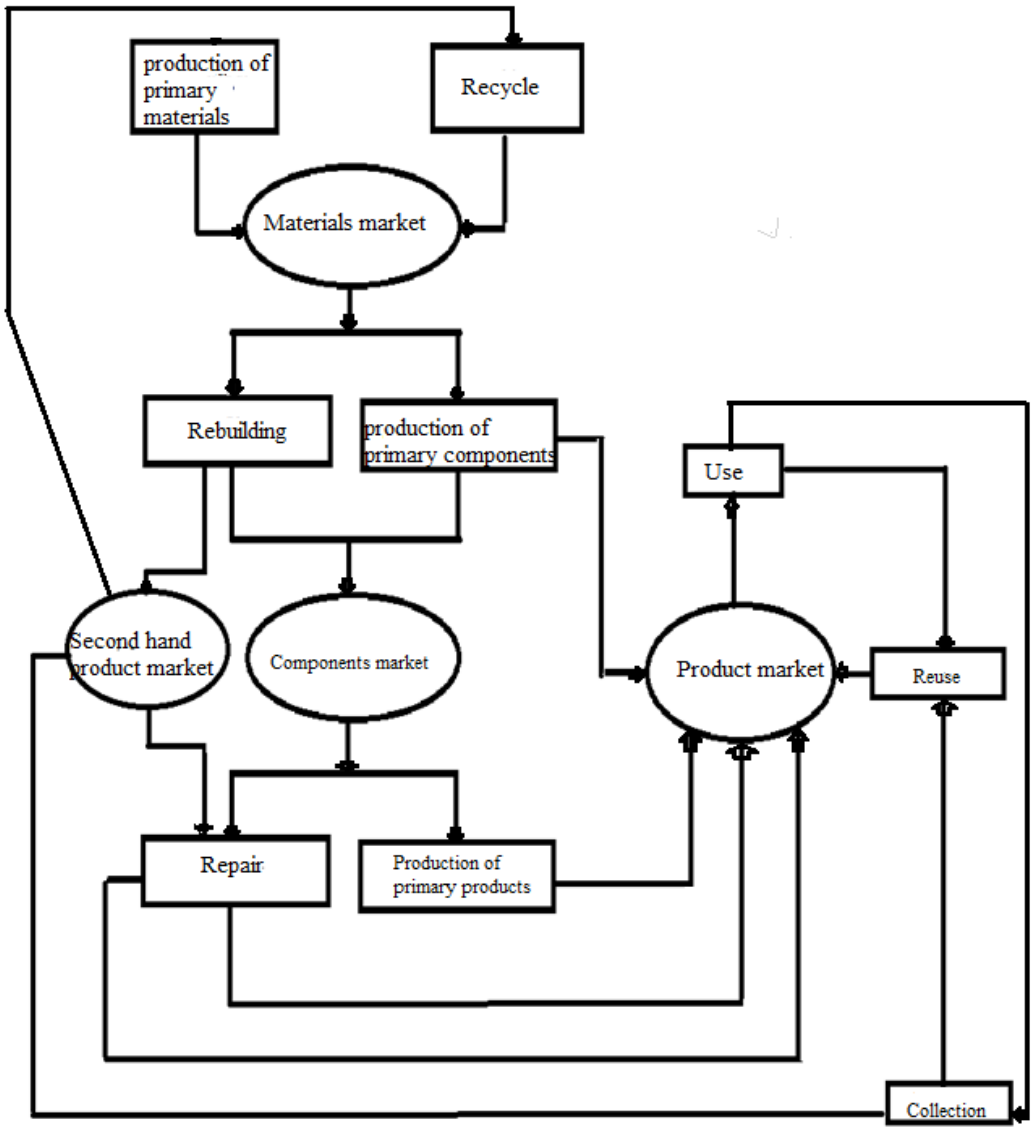
Consequently, because the decisions of structural alignment are made by the top management, their creativity, capacity and commitment are relevant factors for the research examining the transition to the circular business models.

3. Business circular models

The circular business models imply a substantial uncertainty regarding the profitability. In the circular economy, in almost every stage of the active circular process there is a market: a market for final goods, for goods at the end of the life cycle, for unprocessed waste, semi-processed waste, recycled materials, reconditioned products, used repaired products, etc. (Figure 1).

In each of these markets, the secondary goods compete directly with the primary goods.

Figure 1. Markets of circular economy



Source: Graphic construction of the author

The competition of primary and secondary goods in markets is what makes the circular economy promising, it creates the hope that secondary goods and materials could compete and reduce the production of primary goods and materials.

However, interactions between primary and secondary goods are more difficult to predict, and lack of consumer knowledge is also a problem. Some companies that have circular products have difficulty selling their products, especially when it is a price-governed market and a circular product is more expensive than an average product.

The markets in which the economic units compete may have an unclear structure, the product is unclear or absent, and the circular activities can be considered experimental, unstructured and at high risk.

With an uncertain framework as to how tenders should be executed, manufacturers and other actors in the circular process form new types of relationships and collaborations with third-party suppliers. Thus, suppliers of virgin materials have to compete with suppliers of reused materials, and if they are as valuable as virgin materials or if they have a higher and more sustainable value due to recycling, manufacturers will choose reused materials because their prices do not it differs substantially.

The presence of substitutes affects the competitive intensity within an industry, for the benefit of the producers, which have a greater bargaining power. a dominant position in the market.

In industries that are heavily affected by resource shortages and rising demand, suppliers are raising the price of virgin materials. In the long term, minerals, metals and energy sources need to be replaced with renewable alternatives.

The optimal use of resources in manufacturing strengthens the negotiating position of the producers in relation to the suppliers of materials, and the decrease of the demand for materials due to the technological improvement, minimizes the dependence of the producers on the suppliers.

The immediate short-term effect of the transition to business circular models is the outsourcing by manufacturers of reverse logistics operations to third-party suppliers. Logistics services, which are usually outsourced to third-party suppliers, include transportation, warehousing, inventory, value-added services, information services and redesigning the supply chain. The differences between the structures of the industry can affect the relationship between the manufacturer and these service providers.

The new types of structures, which are characterized by concentration and market power, influence the network relations, the positions of the economic units within it and the performance of the industry. The redesign of a product causes its manufacturer to require employees in the reverse supply chain to develop unique expertise, for example, for disassembly, inspection and repair of used products, all of which require substantial investment from third-party service providers.

High investment requirements create entry barriers, which restricts the number of collaborators a producer can choose when establishing collaborations.

Thus, the transition to a circular system can lead to structures with a high degree of concentration, which means that the industry is dominated by a rather small number of actors in its initial stages.

In highly concentrated industries, it is important for network actors to build and maintain collaborative relationships, because mutual dependencies are significant. Therefore, the shift to the circular economy may result in industries with strong links between companies.

Economic units operating in the circular economy by building strong and tight positions in the new industries and markets that are formed Therefore, the companies that

are facing the challenge of carrying out activities in the circular economy by building strong and tight positions in the new industries and emerging markets

There are other significant differences in the implementation of the circular economy between the production companies. In their circular projects, some manufacturers have focused on modularizing their products and components to facilitate their disassembly and repair for reuse.

This approach implies that companies use the same components for different product categories, thus leading to more homogeneous products. In this case, it is easier for manufacturers to find third-party service providers to help disassemble and inspect used products, because the requirements for this in terms of training, specific skills and expertise are relatively small.

Thus, the negotiating position of the producers in relation to these service providers is improved by reducing switching costs. Also, the reduced investment requirements of the service providers increase the rivalry, making it easier for new actors to access the industry, and greater competition (less concentration) between these economic units, allows the producers to occupy a central position in the strategic networks.

For third-party service providers, the quick and easy processing of returned products due to increased modularization or standardization can provide opportunities to gain scale benefits, serving more manufacturers, which can lead to cost advantages. Market entry is fast, because modular product design has made reusing them easier, faster and cheaper.

In the circular economy there are four categories of barriers: cultural, technological, market and regulatory, which are interconnected. For example, cultural barriers determine regulatory barriers, and these, in turn, can determine market barriers, with regulations that frequently create markets.

Market barriers can determine technological barriers from certain market forces, for example financing for a particular technology is required for the emergence of technologies.

Also, there are multiple possible interaction effects between the different categories of barriers. For example, if technological barriers "lack of impact data" exist, market players may have a limited interest in implementing circular business models, thus encouraging the persistence of "limited funding for circular business models" and low pressure to remove "laws." and regulations".

In turn, this can make the products and services of the circular economy more expensive, which may further lead to "lack of awareness and interest of consumers" (Figure 2). The interactions between the four interrelated categories of barriers of the circular economy can lead to a chain reaction, to its failure, thus leaving the linear economic system unchanged.

Another example in terms of the interconnection between regulatory and market barriers is limited circular procurement, which may result in limited funding for circular business models because circular firms may not be able to convincingly prove that they exist. a market for their products in the absence of such purchases. This, in turn, may further undermine the development of a global consensus among decision-makers regarding the transition to the circular economy. Therefore, regulatory barriers can create market barriers that create new regulatory barriers.

The lack of communication and awareness makes it difficult for both manufacturers to sell their products, especially when it is a market governed by price and a circular product is more expensive than a linear product, as well as buyers who have no knowledge to sell. see additional values that circular products have. The knowledge of circular

products is lacking, and it is difficult for economic units to indicate in terms of value what is circular to their product.

Figure 2: Types of barriers in the circular economy

Cultural barriers	Regulatory barriers	Market barriers	Technological barriers
The culture of the hesitant company	Limited circular purchases	Low prices for virgin materials	Ability to deliver high quality remanufactured products
Limited availability to collaborate in the value chain	Obstruction of global laws and regulations	Standardization	Circular design
Lack of consumer awareness and interest	Lack of global consensus	High onvestment costs	Too few projects to prove their validity on a large scale
It operates in a linear system		Limited funding for business circular models	Lack of impact data

Source: Kirchherra, J., Piscicellia, L., Boura, R., Kostense-Smitb, E., Mullerb, J., Huibrechtse-Truijensb, A., Hekkerta, M., (2018). Barriers to the Circular Economy: Evidence From the European Union (EU), Ecological Economics 150, 264–272

Market barriers are considered, especially the low prices of virgin materials and the high investment costs for circular business models. Markets for secondary raw materials, products of the recycling and reprocessing sector, are facing particularly difficult market conditions, with economic units failing to achieve low prices for recycled materials, which barely cover the costs of collection and processing, along with price volatility and competition. from virgin materials at lower prices.

A viable business model for creating markets for secondary raw materials depends on reliable and predictable markets, any weakness of which will affect the entire supply chain, until recycled materials are collected. There is no motivation to collect the material if there is no final market for it.

Reduced prices for recovered materials

Commodity prices are influenced by a different set of factors than those that influence secondary commodities. The prices of secondary materials are established according to the cost and efficiency of the collection and processing of waste, mediated by market demand. In the case of plastics, the fall in the price of oil has lowered the price of virgin plastics to the lowest, equal to that of the recovered plastics.

A surplus of the market for virgin materials, accompanied by the decrease in demand, lowers prices, which makes secondary raw materials not competitive. Under these conditions, the economic units opt for virgin materials, when purchasing the raw materials.

Because the business cycles of virgin and SRM production are so different, the damage to our sector and the circular flow of SRM cannot be easily reduced.

Vulnerability through price volatility

Price volatility is particularly pronounced on the secondary commodity market, and may cause instability between the entry and exit prices, insofar as operators may even face negative net margins.

Some economic units cannot implement strategies so that the commodity market is at the right price point, such as storing secondary raw materials or reducing production by restricting the flow of waste collected in the processing unit. The high costs of waste collection and processing make these activities continue uncontrolled, regardless of the state of the secondary raw materials market.

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4. Conclusions

The article aims to identify the barriers to entry in the circular economy, how the state is involved in the formation of the market mechanism, as well as the evaluation of the sources of financing of the economic agents that have implemented the circular model.

For this purpose, an explanation of the theoretical basis of the concept of active circular process is made and a theoretical analysis of the value creation and implementation of the business models in the circular economy.

One difficulty analysed in structural adaptation is uncertainty, which can influence and slow down the ability of managers and economic units to identify circular business models and define new value propositions that align with the circular economy.

Starting from theoretical orientations that highlight how the circular business model is implemented in practice, the main barriers to entry are identified, and the logical model for interpreting the relationships established within the circular economy is developed.

Given that government regulation and market interventions are direct means of enabling innovation for the transition to the circular economy, institutional conditions that facilitate and encourage investments to improve natural capital and social equity are analysed, with research focusing on government interventions in particular.

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ANALYSIS OF THE MONETARY POLICY TRANSMISSION INTO CEEs COUNTRIES. A VAR APPROACH

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Abstract*: Understanding how real economy adjust to the exchange rate fluctuations enables us to anticipate the effects on inflation, capital market, exports, as well as the monetary policy responses. This study examines the extent of the exchange rate pass-through to the real economy (consumer price index, industrial production, capital market, exports, interest rate) in Bulgaria, Czech Republic, Poland, Romania, and Hungary over the 2008M01-2019M08 period. A Vector Autoregressive analysis using impulse-response functions supported the results for the short term and found a lower degree of passthrough for the exchange rate shocks for all CEE countries. The results of its econometric analysis show that the degree of the exchange rate pass-through is incomplete. The conclusion is that exchange rate remains an important instrument for monetary policy in these economies.*

Keywords*: exchange rate pass-through, vector autoregression, Cholesky decomposition, impulse response function.*
JEL Classifications*: E31, E52, E58, C32.*

1. Introduction

The quantification of the magnitude of exchange rate variation transmission in the real economy represents an extremely important element for the elaboration of economic policies in a small and open economy as it is the case of the central and eastern European states.

The impact of the exchange rate variation on the economy can be measured by the exchange rate pass-through (ERPT), which shows how much the price level changes (and possibly other macroeconomic variables (such as real GDP, industrial output), respond to a change by 1% of the exchange rate. When the passage is equal to one, the exchange rate shock is completely transferred to the price level for example. On the other hand, a zero change implies that the level of domestic prices is independent of the exchange rate. The magnitude and speed of this transmission depend on different determinants, such as the expectations of the economic subjects regarding the evolution of the exchange rate, or the internal demand conditions.

The mechanism of transmitting for depreciation of exchange rate to inflation and increasing production in a small open economy is assumed to operate through direct and indirect effects. In the beginning, the prices of imported final goods are rising, which increases the production costs of domestic producers. Depending on the ERPT size, the price level also increases. In addition to these direct effects, domestic production becomes less expensive than foreign production due to real depreciation, and external demand for domestic goods gradually increases. In response, both the trade balance and domestic production are balanced, and, under these improved conditions, the economy creates premises for more jobs and greater salaries. The magnitude of the exchange rate pass-through receive even a supplementary relevance for monetary policy when the exchange rate is used as an additional unconventional monetary policy tool when short-term interest rates are truncated by the zero-lower limit.

Another mechanism that could be involved in transmitting changes of the exchange rate on the internal rate of inflation, affecting even goods that are not directly sensitive to the exchange rate changes, is represented by the so-called - second-round effects through the inflationary expectations of the economic subjects.

By virtue of exchange rate theories, exchange rates matter because they influence long-term interest rates. A highly valued domestic currency is associated with reduced

long-term risk premiums, while a national currency that suffers from a sharp depreciation is associated with significantly increased risk premiums. Even for a central bank that is not afraid of financial stability, these variations in long-term rates matter for the conditions of the aggregate demand. When financial stability issues are considered, the impact of the exchange rate is even greater. External loans from banks and foreign capital markets increase the exposure in foreign currency, which is further increased with domestic loans denominated in foreign currency.

The exchange rate appreciation tends to reduce inflation, but it fuels debt accumulation by weakening financial conditions, raising vulnerabilities in the medium term. As the risks of financial stability also entail risks for longer-term price stability, this mechanism imposes on central banks in emerging economies a trade-off between short-term and medium-term actions, both for production stability and for price stability.

The economies of Central and Eastern Europe have a number of particular characteristics of the transmission mechanism compared with the old Member States, such as: less developed financial systems, which could result in a weaker effect of autonomous monetary policy on the economy; additional difficulties in anchoring inflation expectations, which can lead to price responses with a larger time lag; higher inflation rate, which complicate the mechanism of monetary policy transmission (because in an inflationary environment, agents adjust their prices more frequently and as such, a lower price rigidity can be identified in these countries compared to more developed economies); the prevalence of the exchange rate channel over the other two traditional channels of the monetary policy transmission mechanism (the interest rate and the credit rate channel); technological and productivity differences; gaps in the level of research and development. Furthermore capital flows are higher than in the euro area, but these capital inflows are also extremely volatile and capital controls have been eliminated; foreign direct investments in these states are large relative to the euro area but there were real appreciations of the exchange rate; notwithstanding the effects of Balassa-Samuelson, inflation has decreased after joining the European Union but shows an upward trend in the current period; the CEECs start from a per capita income (at the purchasing power parity) in half compared to the euro area; therefore, the context in which these states conduct their monetary policy is different compared to other emerging or developed economies.

Ensuring macro-stability, as these economies recovers from the gap with the European economies, was a major challenge after joining the European Union, which also meant the capital account liberalization. In the context of intensification of the international transactions with goods and services, as an effect of the phenomenon of globalization, the degree of openness of CEECs quantified as a share in GDP of exports and imports of goods and services has increased substantially. Of the CEECs countries, Romania recorded the fastest growth rate since the global financial crisis started (but the main growth factor continued to be consumer demand, driven by stimulating conditions, increase in wages and employment, as well as relaxation measures in the fiscal-budgetary sphere). Romania instead recorded one of the highest levels of inflation in EU. As a large part of domestic demand is covered by imports, its increase has led to a deepening of the current account deficit. Even though this level was financed entirely through stable capital flows, the trend in recent years of twin deficits is worrying, given that most EU countries have recorded either current account surpluses or decreasing deficits. Maintaining a sustained trend of GDP growth was thus affected by the accumulation of macroeconomic deficits that were amplified by the increasing openness of the economy towards the outside but especially by the pro-cyclical fiscal policies, factors that amplify the pressure exerted on the exchange rate.

In both Poland and the Czech Republic or Bulgaria, the balance of foreign trade has constant surplus and the current account balance has been positive in recent years. In Hungary, fiscal policy has remained cautious, leading to a decrease in the debt rate as a percentage of GDP and a decrease in foreign debt to reduce the external vulnerability of the economy.

In the first part of the article, we intend to develop a model able to analyze the exchange rate transmission mechanism for the Central and Eastern European Countries: Bulgaria, Czech Republic, Poland, Romania and Hungary and, based on the theoretical framework that governs exchange rate, supplying details regarding the evolution of the real economy response on those shocks. In the second part of the article we offer a quantitative assessment of the magnitude of transmission of real exchange rate changes in the variation of different variables: prices, stock exchange, exports, output, interest rate in CEEC over a horizon of two years.

2. Literature review

While in the case of the advanced economies there are numerous specialized studies that analyze the mentioned above aspects, in case of the emerging economies of CEECs there is a significantly smaller number of such works. Many studies show that the exchange rate pass-through to inflation in many Emerging Economies has decreased considerably in recent times although it often remains larger than in Advances Economies. The decline in exchange rate pass-through to prices is one of the important consequences of the inflation targeting regime adoption since the 1990s Edwards (2006) or Mishkin și Schmidt-Hebbel (2007). Jašová *et al.* (2016)provide an exhaustive study about ERPT before and after the GFC for advanced and emerging economies. The authors note that the Indicator differs over time for both advanced and emerging economies; it also estimates a stable evolution of the indicator in the case of advanced economies, and a decrease in its magnitude in emerging economies argued by reducing inflation rates and second round effect. Özyurt (2016) estimates the magnitude of ERPT in the euro area and finds that it decreased significantly from 0.3 to 0.11 in 2011, when interest rates reached the lower zero limit.

In the case of the Czech Republic, Franta *et al*. (2014), conclude that at the lower zero limit, the exchange rate has a greater impact than in normal times. Franta *et al*. (2014) argue that in the case of small and open economies the use of successive interventions on the exchange rate in order to accelerate economic growth and circumvent the zero lower limit (especially when the central bank does not face severe disruptions of on the financial markets) is quit useless. Providing liquidity through quantitative easing would also have minor effects. Another option would be negative interest rates. Although recent experience shows that interest rates can be set below zero, Franta *et al.* (2014) consider that the Czech National Bank appreciated that the uncertainty generated by these unconventional instruments could have major adverse effects on the economy and ultimately opted for the exchange rate commitment. The exchange rate floor proved to be extremely effective.

In normal times, the central bank may not be willing to accept higher inflation, especially for inflation targeting. Therefore, the increase in the monetary policy rate and the impact of the initial depreciation of the national currency on the economy decreases. However, a diametral situation appears at the lower zero limits, when the central bank wants to increase inflation to combat deflation spiral and, in the case of low inflation expectations, it fights to increase these expectations. In this situation, the monetary authority maintains the nominal interest rate unchanged, and the initial depreciation results in a higher domestic price level and stimulation of economic activity.

Also in the case of the Czech Republic, Baxa and Sextorad (2019) manage to surprise by a Time Varying Parameter-Vector Autoregressive model (TVP-VAR) with stochastic volatility the magnitude of the ERPT in the variation of the different financial variables (taking into consideration that the influence of the interest rate in monetary policy transmission was limited by the commitment applied to the exchange rate). Baxa and Sextorad (2019 p.7) provide supplementary explanation about short run an long run pass-through: "the short-run pass-through is defined as the value of impulse response functions at a given point in time, while the cumulative value of the impulse responses measures the long-run pass-through". The authors note a limited effect of the exchange rate commitment on inflation (this being rather influenced by the structural changes in the Czech economy and not by the temporary effect of the exogenous shocks induced by the introduction of the exchange rate ceiling. On the other hand, the ERPT transmission of production has increased over time, with some possibility of maximum towards the end of the sample.

In the case of Romania Stoian and Murărașu (2015), evaluates the transmission of the changes of the nominal exchange rate in the variation of the different price indices in the Romanian economy (the variation of three price categories: import prices, industrial production prices and consumer prices). The authors use a variety of econometric models in comparison: regression with time-varying coefficients, the Error Correction Model (ECM) and Autoregressive Vectors (VAR) for a sample of data with monthly and quarterly frequency in the period 2000-2014. Regarding the estimation of VAR models, several subsamples, with movable windows, and threshold variables are used to identify possible asymmetric effects on ERPT and the variables used are: CPI inflation rate and CORE2 inflation rate, industrial production prices, international price of Brent oil, the deflator of imports and the real GDP deviation from its potential level as a proxy for inflationary pressures from the real economy. Stoian and Murărașu (2015, p.7) also offer a definition in ERPT in Romanian: "The transmission of the nominal exchange rate changes in the variation of the different price indices can be defined as the percentage change of the internal price level caused by a one point change. percentage of nominal exchange rate". Also here, the authors argue that the value of the indicator presents significant transmission disproportionalities both economically and statistically, determined by the sign and the amplitude of the nominal exchange rate volatility, the inflation rate, as well as specific periods of time (Stoian and Murărașu). , 2015, p.7). The conclusion of the study is that the magnitude of ERPT in Romania has decreased.

Arratibel and Michaelis's (2014) study uses a Bayesian VAR model with time-varying parameters, developed by Primiceri (2005), to analyze whether the reaction of production and prices to interest rate and exchange rate shocks changed by - over time (1996-2011) in the Polish economy. Empirical results show that production seems more receptive to a shock in the interest rate at the beginning of the sample - since 2000, the absorption of this shock has become less costly in terms of production, despite fluctuations since the beginning of the Great Financial Crisis from 2008-2009. The shock of the exchange rate also has an effect that varies over time on production. From 1996 to 2000, the production seems to decrease, while for the periods between 2000 and 2008 the shock of the exchange rate has a significant positive effect on the industrial production. Consumer prices seem more sensitive to a shock in the interest rate in the first half of the sample, when Poland experienced high inflation. The impact of the exchange rate shock on prices seems to decrease slightly.

Darvas (2013), compares the transmission mechanism of monetary policy and its effect on the main macroeconomic variables for the Czech Republic, Hungary, and Poland with the euro area. As these three states have undergone changes in monetary policy and

currency regimes changes as well as large structural transformations in the economy (moving from the centralized economy to the free market economy), it is necessary to use an analysis that involves variables (drift) parameters precisely for capture all these changes. Thus, through the modeling of TVP-VAR, it is found that the effect of a monetary shock to the production has evolved over time. The model estimates that at the last observation of the sample studied, respectively in the last quarter of 2011, the monetary policy in the case of Poland was the most effective recording performance similar to the transmission in the euro area. However, we discuss various factors that may contribute to the differentiation in the monetary transmissions specific to these states, such as the structure of the financial systems (less developed), the rigidity of the labor market, the structure of the industry, the exchange rate regime, the credibility of the monetary policy and the commercial openness as the fundamental factors that diminish the efficiency of the domestic monetary policy.

3. Methodology and data

The estimation is made by using monthly data for the period 2008M01-2019M08 (excepting Bulgaria where the data span includes the interval 2008M01-2018M07 due to some missing data for interest rate in Bloomberg). The data series come from the databases of the Eurostat, Bloomberg, as well as Bruegel dataset (available at: <http://www.bruegel.org) and include: actual real effective exchange rate, industrial production prices - total industry, exports, imports, stock exchange indexes (SOFIX BUX PX WIG10 BET) , inflation rate and interest rate (SOFIBOR BUBOR PRIBOR WIBOR ROBOR). The unit value index of imports is calculated by Eurostat on a monthly basis, using the values expressed in million euros of foreign EU trade in goods and services partners, and provides, together with fluctuations in the nominal exchange rate, information about developments in imported inflation.

The first five mentioned indicators have been replaced with the annual value index (the monthly data has been transformed in year on year monthly variation using formula: 100* current value/t-1 value) and renamed: reer_growth for real exchange rate variation, y for industrial production rate, nx for commercial balance (exports minus imports), and stock_growth for stock exchange indexes yields variation. The last two variables are a series of indicators calculated as effective measures: inflation rate (noted infl) and interest rate (noted r).

The model uses a recursive identification scheme, the variables being ordered, from the most exogenous to the most endogenous, depending on the contemporary influences that exist between them, as described below:

infl « y « nx « reer_growth » stock_growth » r

The number of lags (here two lags) of the VAR model in a reduced form and with level variables is chosen according to the Akaike informational criterion, to preserve the number of degrees of freedom. Johansen cointegration tests, performed to assess the existence of some long-term equilibrium relationships between the analyzed variables, indicate a single relationship of cointegration.

From the analysis of the fundamental statistical properties of the data (the main statistic for CEECs countries are presented in Appendix1), we observe that the values of the distribution parameters for the six variables selected for each analyzed state suggests that there were events that pushed upward and downward the data distribution mode, removing them, for a period ,from the normal distribution. But we have an attractor, an

area of concentration of variables even though the values of the Jarque-Bera test (well above the zero value) clearly reject the normal distribution.

From the preliminary stage of our analysis, if we evaluate the comparative evolution of the REER_GROWTH indicator, for the five CEECs, we observe in the case of the average, which is also the simplest estimator of the central tendency, it takes negative values in all the CEE countries studied, except Bulgaria. These values can be explained by the currency regime adopted in these states: (controlled floating and free-floating) for Romania, the Czech Republic, Poland and Hungary and in the case of Bulgaria, by the extreme fixed currency regime option such as the monetary council.

For the median, which is a robust indicator of the data distribution center, less sensitive to the effects induced by the existence of extreme values or outliers compared to the average we also find positive values for Bulgaria, respectively negative for the other analyzed states. Although the values of the Jarque-Bera test show no normal distribution, the values of the median, as well as the coefficients of asymmetry indicate the existence of an attractor in data and that the shocks involved in the variables tend to balance in the long term, these following a trajectory similar to the normal distribution.

The minimum and maximum levels allow the time series to be included in the evolution thresholds for the observation period. Thus, in the case of Bulgaria we have evolutions in the range [-5,785: 6,116], for the Czech Republic [-10,008: 9,745], for Poland [-11,101: 17,940], Romania [-11,536: 8,779], and Hungary [-13,731: 17,613]. We notice lower values of real exchange rate variation in the fixed regime and larger amplitudes for the floating regimes, with maximum values for Poland where the foreign exchange regime is one of free-floating.

From the analysis of the standard deviation of the data for the 5 CEE countries analyzed, which is also the simplest form of volatility measurement, we also note here, the maximum value in the case of Poland (6,818) where a free-float regime has been operating since 2000, respectively the minimum values (1,497) are found in the case of Bulgaria where, since 1997, the exchange rate regime is an extreme variant of fixed exchange rate (currency board) and the monetary policy strategy adopted is that of targeting the exchange rate.

In order to estimate the transmission coefficient of exchange rate changes in the variation of prices and other financial variables, as modeling procedure we used for estimation the model based on Autoregressive Vectors proposed by Sims (1980) that capitalizes on the advantage of a higher frequency of the available data series (in this case, monthly frequency).Another reason why we chose a VAR model proposed by Sims (1980) is that this analytical method is one of the most commonly used in modeling and forecasting the transmission mechanism of monetary policy, in particular of aggregate macroeconomic variables and monetary policy shocks (Gorgi, Koopman and Schaumburg, 2017). Fry and Pagan (2005) argue that these models offer the best combination of database-based models and those that describe economic theory.

In the proposed VAR model for the analysis of CEECs states, each variable is predicted as a linear function of the variable from the previous period, plus the effects from the previous period of the other variables that build the model: it is assumed that each variable at time t is estimated through changes of the other variables. (including through its own variation) compared to the previous moment of time (t -1). In addition to a set of parameters, the VAR model is composed of autoregressive effects, which indicates, on the one hand, the level to which a variable is estimated by its evolution over a previous period, (the dependent variable is modeled according to its own observations) and, on the other hand, effects with time-lag (hysteresis), caused by changes of the other variables from a previous moment (eng. cross-lagged). By the Cholesky decomposition, the assumptions

that are taken into account are, for example, that a shock in the real exchange rate (negative evolutions represent the depreciation of the real exchange rate while positive values constitute appreciation) simultaneously affects only the stock market and the interest on monetary policy and with time lag exports, output, and consumer prices.

For the VAR model, we will have six simultaneous equations that reflect the link between the actual real exchange rate (reer_growth), inflation (inflation), industrial production (y), trade balance (nx), the financial market, exposed by the dynamics of the stock indexes of each state (stock_growth), respectively the money market represented by the evolution of the interbank interest rate, monthly series (r). In order to track the effect of the exchange rate fluctuation in the change of the real economy variables, we use a vector of the following macroeconomic and financial variables.

$$\{reer\_growth, inflation, y, nx, stock\_growth, r\},$$

Although the arguments for including the external sector are well-founded in the literature, the differences between VAR models and without blocking foreign variables are not great. Borys *et al.* (2009) regarding the linear VAR model, the shock of monetary policies can be well-identified without affecting the results and without the input of external variables.

$$Reer\_growth_t = A_1 + \sum_{j=1}^{j=p} B_{1j} reer\_growth_{t-j} + \sum_{j=1}^{j=p} C1_j infl_{t-j} + \sum_{j=1}^{j=p} D1_j Y_{t-j}$$

$$+ \sum_{j=1}^{j=p} E_{1j} NX_{t-j} + \sum_{j=1}^{j=p} F_{1j} Stock\_growth_{t-j} + \sum_{j=1}^{j=p} G_{1j} R_{t-j} + u_{1t} \quad (1)$$

$$Infl = A_1 + \sum_{j=1}^{j=p} B_{1j} Reer\_growth_{t-j} + \sum_{j=1}^{j=p} C_{1j} Infl_{t-j} + \sum_{j=1}^{j=p} D_{1j} Y_{t-j} + \sum_{j=1}^{j=p} E_{1j} NX_{t-j}$$

$$+ \sum_{j=1}^{j=p} F_{1j} Stock\_growth_{t-j} + \sum_{j=1}^{j=p} G_{1j} R_{t-j} + u_{1t} \quad (2)$$

$$Y = A_3 + \sum_{j=1}^{j=p} B_{3j} Reer\_growth_{t-j} + \sum_{j=1}^{j=p} C_{3j} Infl_{t-j} + \sum_{j=1}^{j=p} D_{3j} Y_{t-j} + \sum_{j=1}^{j=p} E_{3j} NX_{t-j} +$$

$$\sum_{j=1}^{j=p} F_{3j} Stock\_growth_{t-j} + \sum_{j=1}^{j=p} G_{3j} R_{t-j} + u_{3t} \quad (3)$$

$$NX = A_4 + \sum_{j=1}^{j=p} B_{4j} Reer\_growth_{t-j} + \sum_{j=1}^{j=p} C_{4j} Infl_{t-j} + \sum_{j=1}^{j=p} D_{4j} Y_{t-j} + \sum_{j=1}^{j=p} E_{4j} NX_{t-j} +$$

$$\sum_{j=1}^{j=p} F_{4j} Stock\_growth_{t-j} + \sum_{j=1}^{j=p} G_{4j} R_{t-j} + u_{4t} \quad (4)$$

$$Stock\_growth = A_5 + \sum_{j=1}^{j=p} B_{5j} Reer\_growth_{t-j} + \sum_{j=1}^{j=p} C_{5j} Infl_{t-j} + \sum_{j=1}^{j=p} D_{5j} Y_{t-j} +$$

$$\sum_{j=1}^{j=p} E_{5j} NX_{t-j} + \sum_{j=1}^{j=p} F_{5j} Stock\_growth_{t-j} + \sum_{j=1}^{j=p} G_{5j} R_{t-j} + u_{5t} \quad (5)$$

$$R = A_6 + \sum_{j=1}^{j=p} B_{6j} Reer\_growth_{t-j} + \sum_{j=1}^{j=p} C_{6j} Infl_{t-j} + \sum_{j=1}^{j=p} D_{6j} Y_{t-j} + \sum_{j=1}^{j=p} E_{6j} NX_{t-j} +$$

$$\sum_{j=1}^{j=p} F_{6j} Stock\_growth_{t-j} + \sum_{j=1}^{j=p} G_{6j} R_{t-j} + u_{6t} \quad (6)$$

Source: We applied the original model proposed by Sims (1980) using our own variables

Where u_t is the term error, or impulse (innovations or shocks) in VAR language.
The matrix form of the equation can be written:

$$AY_t = BY_{t-1} + CX_t + D\varepsilon_t$$

Where: matrix A comprises all the coefficients that present the contemporary links between the variables, the matrix B is assigned the coefficients for the time-lag variables, and the matrix C treats the coefficients that describe the links between the explanatory and the dependent variables. The matrix D is a diagonal matrix and the vector ε assumes the values of the residual random variable. By multiplying the VAR system by the inverse of matrix A, we obtain the relation:

$$Yt = (A)^{-1}By_{t-1} + (A)^{-1}\,CX_t + (A)^{-1}D_{\varepsilon t} \quad (8)$$

The equation can be rewritten as follows:

$$VAR\left(reer_{growtht}\right) = \alpha\left(reer_{growtht-1}\right) + \beta\begin{pmatrix} y_{t-1} \\ nx_{t-1} \\ reer_{growtht-1} \\ stock_{growtht-1} \\ r_{t-1} \end{pmatrix} + \mu_t \quad (9)$$

The vector of the exogenous variables (cause) includes the six variables of interest, considered in the analysis, respectively: the inflation rate (inflation), the variation of the annualized industrial production, the dynamics of the annualized trade balance (nx), the annualized variation of the real exchange rate (reer), the dynamics annualized stock indexes (stock_growth) and the evolution of the interbank interest rate (r), all six variables being presented at time t for each central and eastern European countries mentioned. The vector of the endogenous variables includes the estimated values of the exchange rate as a conjugate effect of the exchange rate values from the previous period and of the other variables considered in the analysis, all six variables being presented at time t for each CEE state.

In the case of our model, a monetary policy shock is identified by standard Cholesky decomposition (decomposition of positive Hermitian symmetric matrices into two conjugate matrices). Impulse response functions are required to quantify the magnitude of ERPT. Their determination requires the recovery of structural shocks from shocks of the VAR model in the reduced form, marked with the symbol, applying the Cholesky decomposition:

$$\begin{pmatrix} \varepsilon t\ infl \\ \varepsilon ty \\ \varepsilon t\ nx \\ \varepsilon t\ reer_{growth} \\ \varepsilon t\ stock_{growth} \\ \varepsilon t\ r \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ a11 & 1 & 0 & 0 & 0 & 0 \\ a11 & a11 & 1 & 0 & 0 & 0 \\ a13 & a13 & a33 & 1 & 0 & 0 \\ a14 & a14 & a34 & a44 & 1 & 0 \\ a15 & a15 & a35 & a45 & a55 & 1 \end{pmatrix} + \begin{pmatrix} \mu t\ infl \\ \mu t\ y \\ \mu t\ nx \\ \mu t\ reer_{growth} \\ \mu t\ stock_{growth} \\ \mu t\ r \end{pmatrix} \quad (10)$$

The use of Cholesky decomposition implies the restriction that a shock of the exchange rate influences only the stock exchange and monetary policy interest, and with a time lag, exports, industrial production, and inflation.

4. Results and comments

The main virtue of the VAR model is its ability to provide impulse response functions for the variable of interest, the variance decomposition, and the decomposition of the shocks. The estimated responses to a unitary depreciation of the REER are shown in Figure 1, while Table 1 shows detailed average responses of real economy to exchange rate variation for 24 month time horizons (i.e. price level, industrial production rate, trade balance, interest rate, stock exchange yield, and exchange rate) for entire sample of CEECs. The resulting transfer period is quite fast: more than half of the transfers: to output, exports and real exchange rate takes place in the first six, eight months after a unit depreciation of the exchange rate. In addition, ERPT is almost completed after one year for those indicators. Consumer price response and interest rate responses to exchange rate shocks seem to be more persistent (about 24 months). In addition, the effect of the exchange rate variation on the price level is incomplete (a 1% depreciation leads to a less than proportional increase in the price level).

The interesting results values for the transfer of exchange rate variation on consumer prices take place for Czech Republic where there was applied an exchange rate floor[1].

After three months of decrease, the response of the price level sharply increases and reach positive values. The other countries from our sample have only negatives responses. Relating the exchange rate pass-through production, in Bulgaria the output seems to respond better to the real exchange rate shocks. Although the contribution of external shocks may be significant, the results show that transmission of exchange rate variation on inflation is low and has long-term implications. The discrepancy between the effects on output and those on inflation can be easily explained by a flattened Phillips curve (which implies that the dynamics of production growth and inflation has become increasingly independent of each other)

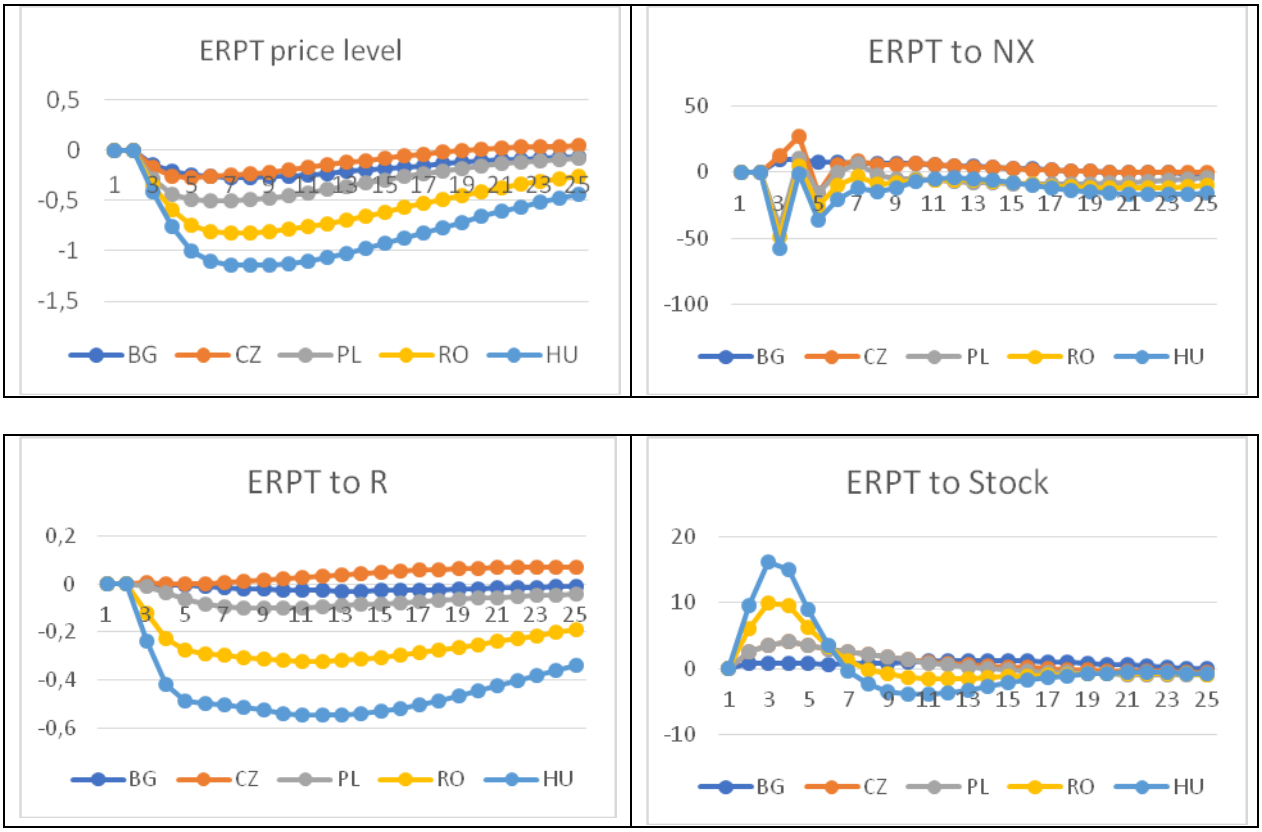
The response of exports to exchange rate shocks, are more consistent in Czech Republic, Poland, and Hungary. This effect can be attributed to the long-term changes in the Czech, Polish and Hungarian economies, which include increasing internationalization of production and participation in the global value chains. In these three states, monetary policy is also the most efficient, recording performance similar with the euro area transmission. However, we discuss various factors that may contribute to the differentiation in the monetary transmissions specific to these states, such as the structure of the financial systems (less developed), the rigidity of the labor market, the structure of the industry, the exchange rate regime, the credibility of the monetary policy and the commercial opening as the fundamental factors that diminishes the efficiency of the domestic monetary policy.

The response of the interest rate to exchange rate shocks seems to have different results in Czech Republic, compared with the others CEECs countries (the interest rate was

[1] the exchange rate floor was applied between November 2013 - April 2017, set at 17 CZK / EUR; the exchange rate depreciated immediately by 7%, from 15.5 to 17.5 CZK / EUR. At that time, the goal was to use the exchange rate as an additional unconventional tool to increase the effectiveness of monetary policy when nominal interest rates were lowered to the zero lower limits, while the inflation rate was well below the 1% target, in particular. to break the deflationary spiral. However, contrary to forecasts, the commitment became credible in 2015 and the rise in inflation materialized at the end of 2016, about a year later than expected

constrained by the zero-lower bound. Hungarian and Czech stock exchange respond more intensive to the real exchange rate variation. The results could be justified by the refuge of investors affected by the depreciation of the nominal exchange rate in financial markets.

Figure 1. Exchange rate pass-through for CEECs



5. Conclusion

The results suggest that the importance of exchange rate shocks is fundamentally time dependent. Therefore, there is a loss of information when using standard linear models, which are, on average, time-consuming. The main conclusions underline the importance of the exchange rate channel, it significantly influencing the evolution of the real economic variables. We note that the response of the exchange rate to the shocks of domestic demand and supply weakened during the analyzed period and that the magnitude of the transmission of the real exchange rate volatility in the variation of the price index decreased. We identified transmission coefficients below zero both in the case of prices, as well as in the case of industrial production and other variables. The paper highlights the existence of significant asymmetries as well from the statistical point of view, as well as economically, of the analyzed transmission process, according to the sign and magnitude of the changes of the real exchange rate, as well as in the case of specific periods of time. An important conclusion that emerges from this study is that, over time, the magnitude of transmission of real exchange rate changes in the variation of the consumer price index and in the interest rate volatility in all 5 CEECs has decreased.

Table 1 Exchange Rate Pass-Through (Linear VAR with Exogenous Variables) CEECs

Variables	Country	M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
INFL	BG	0	-0.14271	-0.21161	-0.2497	-0.26664	-0.27283	-0.27128	-0.26495	-0.25513	-0.24293	-0.22911	-0.21428	-0.19892	-0.18343	-0.16813	-0.15325	-0.13897	-0.12545	-0.11277	-0.101	-0.09017	-0.08028	-0.07132	-0.06327
	CZ	0	-0.03014	-0.04913	-0.02471	0.002628	0.019333	0.035207	0.046076	0.058154	0.070201	0.080068	0.089136	0.097328	0.104212	0.109911	0.114248	0.117225	0.118885	0.11925	0.118416	0.116497	0.113613	0.109911	0.105536
	PL	0.000000	-0.1153	-0.17372	-0.22145	-0.24102	-0.24954	-0.25444	-0.25581	-0.25395	-0.25032	-0.2444	-0.23691	-0.22824	-0.21873	-0.20868	-0.19833	-0.18784	-0.17736	-0.16697	-0.15678	-0.14686	-0.13725	-0.12801	-0.11917
	RO	0	-0.06026	-0.16107	-0.25555	-0.29872	-0.31989	-0.32805	-0.33387	-0.33704	-0.33817	-0.3365	-0.33224	-0.32547	-0.31655	-0.30576	-0.29348	-0.28004	-0.2658	-0.25107	-0.23616	-0.2213	-0.20671	-0.19254	-0.17892
	HU	0	-0.06026	-0.16107	-0.25555	-0.29872	-0.31989	-0.32805	-0.33387	-0.33704	-0.33817	-0.3365	-0.33224	-0.32547	-0.31655	-0.30576	-0.29348	-0.28004	-0.2658	-0.25107	-0.23616	-0.2213	-0.20671	-0.19254	-0.17892
y	BG	-0.24309	-0.45206	-0.87981	-1.02231	-1.14089	-1.13331	-1.07417	-0.96607	-0.83157	-0.68373	-0.53213	-0.3849	-0.24682	-0.12162	-0.01125	0.083215	0.161602	0.224334	0.272287	0.306652	0.328815	0.340274	0.342561	0.33719
	CZ	0.427122	0.090842	0.087665	0.088725	0.078541	0.17897	0.205502	0.159188	0.130992	0.086576	0.033688	-0.0211	-0.07904	-0.13458	-0.18664	-0.23523	-0.27832	-0.31591	-0.34771	-0.37347	-0.39335	-0.40755	-0.4163	-0.42002
	PL	-0.59566	-0.40539	-0.39004	-0.18247	-0.13001	-0.06935	-0.05219	-0.02702	-0.00563	0.011123	0.026989	0.041173	0.049964	0.055342	0.058105	0.058541	0.056970	0.053813	0.049349	0.043897	0.037776	0.031251	0.024537	0.017834
	RO	0.578966	-0.25556	0.129642	0.045636	0.165332	0.084968	0.050343	-0.01559	-0.05046	-0.08014	-0.09367	-0.10046	-0.09958	-0.09487	-0.08723	-0.07853	-0.06957	-0.06117	-0.05368	-0.04732	-0.04211	-0.03797	-0.03477	-0.03234
	HU	0.578966	-0.25556	0.129642	0.045636	0.165332	0.084968	0.050343	-0.01559	-0.05046	-0.08014	-0.09367	-0.10046	-0.09958	-0.09487	-0.08723	-0.07853	-0.06957	-0.06117	-0.05368	-0.04732	-0.04211	-0.03797	-0.03477	-0.03234
NX	BG	0	9.046452	9.105645	7.637571	7.914364	7.029114	6.974042	6.484782	6.085994	5.52859	4.920039	4.261162	3.583432	2.914467	2.271732	1.67265	1.126885	0.641676	0.220113	-0.13715	-0.4317	-0.66674	-0.84661	-0.97647
	CZ	0	3.117814	17.76833	-23.3238	-2.16017	1.621374	-1.71505	-1.03687	0.099703	-0.27563	0.019844	-0.23739	-0.12066	-0.12814	-0.19533	-0.17498	-0.12822	-0.10497	-0.03852	0.030303	0.111214	0.19755	0.286893	0.376111
	PL	0.000000	-53.2214	-16.0241	6.351811	-5.54904	-2.44085	-7.69879	-10.2769	-10.9932	-11.7415	-12.0015	-11.991	-11.9527	-11.7169	-11.3611	-10.8501	-10.2012	-9.44472	-8.59907	-7.68289	-6.71586	-5.71497	-4.69798	-3.68121
	RO	0	-8.1175	-5.87027	-10.1835	-10.2133	-8.99679	-6.11609	-3.4031	-1.08599	0.457832	1.322975	1.556443	1.305433	0.692385	-0.14848	-1.10607	-2.08515	-3.01477	-3.8444	-4.54324	-5.09623	-5.50103	-5.76451	-5.89986
	HU	0	-8.1175	-5.87027	-10.1835	-10.2133	-8.99679	-6.11609	-3.4031	-1.08599	0.457832	1.322975	1.556443	1.305433	0.692385	-0.14848	-1.10607	-2.08515	-3.01477	-3.8444	-4.54324	-5.09623	-5.50103	-5.76451	-5.89986
R	BG	0	-0.00194	-0.00348	-0.0063	-0.01011	-0.01437	-0.0185	-0.02218	-0.02516	-0.02735	-0.02875	-0.02938	-0.02933	-0.02868	-0.02756	-0.02605	-0.02426	-0.02228	-0.0202	-0.01809	-0.016	-0.01399	-0.01209	-0.01032
	CZ	0	0.004797	0.001678	0.006768	0.012457	0.021035	0.030436	0.039866	0.048458	0.056308	0.063205	0.069082	0.073924	0.077782	0.08074	0.082885	0.084311	0.085116	0.085392	0.085225	0.084692	0.083863	0.082797	0.081546
	PL	0.000000	-0.01085	-0.035	-0.06423	-0.08676	-0.10046	-0.11022	-0.11739	-0.12312	-0.12719	-0.12979	-0.13128	-0.13192	-0.13184	-0.13118	-0.13004	-0.12854	-0.12677	-0.12481	-0.1227	-0.12048	-0.11821	-0.11591	-0.11362
	RO	0	-0.11543	-0.19109	-0.2118	-0.20673	-0.20511	-0.20773	-0.21358	-0.21906	-0.22335	-0.22588	-0.22674	-0.22593	-0.22355	-0.21972	-0.2146	-0.20839	-0.20127	-0.19343	-0.18507	-0.17634	-0.16742	-0.15842	-0.14946
	HU	0	-0.11543	-0.19109	-0.2118	-0.20673	-0.20511	-0.20773	-0.21358	-0.21906	-0.22335	-0.22588	-0.22674	-0.22593	-0.22355	-0.21972	-0.2146	-0.20839	-0.20127	-0.19343	-0.18507	-0.17634	-0.16742	-0.15842	-0.14946
STOCK_GROWTH	BG	0.888422	0.923321	0.814585	0.753441	0.721841	0.745767	0.820096	0.923265	1.037544	1.141655	1.221893	1.268459	1.277269	1.248147	1.184053	1.089951	0.971933	0.836526	0.690166	0.538843	0.387868	0.241746	0.104127	-0.02219
	CZ	1.709354	2.589042	3.278712	2.835425	2.317789	1.800944	1.298701	0.844314	0.38115	-0.03065	-0.35746	-0.61768	-0.8116	-0.94312	-1.0211	-1.05162	-1.04367	-1.00503	-0.94246	-0.86249	-0.77059	-0.67137	-0.56876	-0.46587
	PL	3.984606	4.689251	3.334154	2.257323	1.328860	0.659743	0.392580	0.130986	-0.04183	-0.18639	-0.3012	-0.38806	-0.44987	-0.49389	-0.52348	-0.5429	-0.55384	-0.55809	-0.55662	-0.55007	-0.53893	-0.52363	-0.50449	-0.48185
	RO	3.44002	6.358895	5.450841	2.672172	0.231678	-1.39978	-2.24474	-2.58516	-2.59341	-2.4021	-2.09018	-1.72213	-1.34312	-0.98614	-0.67098	-0.40799	-0.19994	-0.04468	0.063196	0.130765	0.165778	0.175844	0.167943	0.14812
	HU	3.44002	6.358895	5.450841	2.672172	0.231678	-1.39978	-2.24474	-2.58516	-2.59341	-2.4021	-2.09018	-1.72213	-1.34312	-0.98614	-0.67098	-0.40799	-0.19994	-0.04468	0.063196	0.130765	0.165778	0.175844	0.167943	0.14812
REER_GROWTH	BG	0.788808	0.801022	0.720364	0.574958	0.43024	0.294296	0.178216	0.081417	0.002871	-0.05975	-0.10888	-0.14661	-0.17484	-0.19509	-0.20869	-0.21671	-0.22009	-0.21962	-0.21599	-0.20982	-0.20163	-0.1919	-0.18105	-0.16943
	CZ	1.606183	1.728705	1.545419	1.413584	1.260857	1.087911	0.938882	0.8089	0.69209	0.585812	0.492067	0.412138	0.34332	0.284097	0.234062	0.191908	0.15653	0.126997	0.102423	0.082034	0.06515	0.051181	0.03964	0.030106
	PL	1.972234	2.518644	2.038447	1.365199	0.868730	0.579926	0.397931	0.285602	0.192218	0.118999	0.060132	0.013805	-0.02112	-0.04591	-0.06346	-0.07592	-0.08483	-0.09102	-0.09508	-0.09743	-0.09837	-0.09811	-0.0968	-0.09451
	RO	1.467723	1.5701	1.15297	0.753291	0.453783	0.255794	0.108039	-0.00266	-0.08685	-0.14661	-0.18666	-0.21078	-0.22312	-0.22688	-0.22473	-0.21866	-0.21022	-0.20048	-0.19023	-0.17995	-0.16997	-0.16044	-0.15142	-0.14292
	HU	1.467723	1.5701	1.15297	0.753291	0.453783	0.255794	0.108039	-0.00266	-0.08685	-0.14661	-0.18666	-0.21078	-0.22312	-0.22688	-0.22473	-0.21866	-0.21022	-0.20048	-0.19023	-0.17995	-0.16997	-0.16044	-0.15142	-0.14292

Source: author contribution based on the analyzes performed in Eviews 11 and Excel

Table 2. Main statistics for CEECs countries

BULGARIA	REER_GROWTH	Y	INFL	R	NX	STOCK_GROWTH
Mean	0,054	0,791	1,093	1,915	18,611	514,911
Median	0,011	3,638	1,600	0,810	-10,800	455,550
Maximum	6,116	13,553	14,700	7,170	353,300	1419,560
Minimum	-5,785	-16,116	-1,500	-0,118	-340,800	164,710
Std. Dev.	1,497	9,050	3,814	1,179	111,985	117,566
Skewness	0,105	-1,637	1,669	0,970	0,001	1,151
Kurtosis	1,349	5,671	5,719	1,757	3,364	3,364
Jarque - Bera	54540,81	4,981	98,391	149,561	4,966	180,316
Probability	0,000	0,081	0,000	0,000	0,083	0,000

CEHIA	REER_GROWTH	Y	INFL	R	NX	STOCK_GROWTH
Mean	-0,194	1,771	1,919	1,110	11,911	0,004
Median	-0,114	4,610	1,700	1,040	9,100	0,174
Maximum	9,745	15,544	7,900	4,510	814,300	77,671
Minimum	-10,008	-11,711	-0,500	0,180	-801,100	-59,074
Std. Dev.	4,131	7,111	1,745	1,078	178,731	19,451
Skewness	0,117	-1,643	1,469	1,441	-0,109	0,119
Kurtosis	1,859	6,175	5,301	4,455	3,374	5,941
Jarque - Bera	1,116	115,747	81,31	61,36	1,004	47,539
Probability	0,569	0,000	0,000	0,000	0,605	0,000

POLONIA	REER_GROWTH	Y	INFL	R	NX	STOCK_GROWTH
Mean	-1,441	4,949	1,931	3,119	185,581	1,401
Median	-0,510	5,370	1,700	1,710	311,650	0,047
Maximum	17,940	15,417	4,600	6,850	1185,400	65,069
Minimum	-11,101	-13,554	-1,300	1,650	-877,900	-53,114
Std. Dev.	6,818	4,913	1,757	1,550	399,913	11,016
Skewness	-0,756	-0,914	-0,005	0,581	0,0945	0,345
Kurtosis	4,943	5,067	1,665	1,141	3,114	3,670
Jarque - Bera	31,479	41,010	10,393	11,116	0,460	4,941

Probability	0,000	0,000	0,005	0,001	0,794	0,084
ROMÂNIA	REER_GROWTH	Y	INFL	R	NX	STOCK_GROWTH
Mean	-0,788	4,661	4,639	4,639	40,178	8,961
Median	-0,565	4,401	3,140	3,140	-39,800	9,033
Maximum	8,779	10,098	15,910	15,910	1008,600	180,571
Minimum	-11,536	-17,774	0,500	0,500	-419,700	-74,487
Std. Dev.	4,314	6,191	3,840	3,840	177,53	31,311
Skewness	-0,133	-0,665	1,113	1,113	1,810	1,877
Kurtosis	1,195	4,695	3,537	3,537	6,343	11,411
Jarque - Bera	1,194	14,769	31,160	31,160	119,305	547,738
Probability	0,000	0,000	0,000	0,000	0,000	0,000
UNGARIA	REER_GROWT	Y	INFL	R	NX	STOCK_GROWTH
Mean	-1,316	1,897	1,940	3,896	16,147	10,574
Median	-1,856	3,947	3,000	3,170	11,150	6,970
Maximum	17,613	17,489	7,400	11,870	415,800	118,983
Minimum	-13,731	-17,070	-1,400	0,010	-381,400	-56,640
Std. Dev.	5,337	8,144	1,141	3,153	176,381	17,738
Skewness	0,581	-1,811	0,015	0,353	0,161	0,919
Kurtosis	4,113	6,711	1,059	1,865	1,351	5,778
Jarque - Bera	13,819	144,707	5,180	10,411	1,801	59,599
Probability	0,000	0,000	0,075	0,005	0,146	0,000

Source: author contribution based on the analyzes performed in Eviews 11

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BANK OF THE FUTURE

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Abstract: *Banks downsizing their branch networks could be jeopardizing their future. Traditional branches, physical, built of brick and mortar, are, almost everywhere in the world, increasingly empty, with elderly clientele seemingly being the only ones to visit them, because more and more are switching to digital banking and, as a result, rarely go to physical branches. Financial service providers are expanding their role in providing services to consumers, managing or using money, and the greater this role, the more disrupted the bank-client relationship will be. Bank regulations increasingly leave room for IT companies to enter the banking services market or even force banks to cede land to new intermediaries. Banks and banking analysts are currently talking about the opportunities offered by the Internet of Things - the multitude of objects interconnected via the Internet - and how they can be adapted to banks' IT platforms, about the blockchain technology on which virtual currencies such as Bitcoin are based, about the development of real-time payment systems and the need to change banks' business models. But in this context we must also think about the security of information in the virtual space, the management of risks in the context of the digital revolution and the threats to cybersecurity. So what will the banks of the future look like?*

Keywords: *digital banking, financial service providers, banking regulations, blockchain technology*.
JEL classification: *G21.*

1. Introduction

A report entitled *The future of the bank branch is in trouble - here's why* (Heggestuen, 2015), which analyzes the trends in the banking industry considers that (Cazan, 2016):

– Banks' traditional, physical branch/agency seems to be outdated. It is not dead yet, but its end seems to be approaching, because of the improvement of online channels, in parallel with the decrease in branch visits and the increase in costs for transactions in branches lead to frequent branch closures.

– Banks that do not adapt to client requirements and do not act quickly will lose significant customer shares, because clients are increasingly opting for digital banking services offered by technology companies. This breaks the traditional relationship between banks and their clients, and banking institutions lose revenue from traditional products, but also from cross-selling opportunities.

– The ATM will follow in the footsteps of telephone booths. Relatively low operating costs compared to bank branches, associated with customer preference for ATM networks, make ATMs an attractive substitute for bank counters, but the use of cash is increasingly declining, and other services performed through ATMs will be able to be performed with other equipment, so in the end the ATM will share the same fate as the branch.

– The smartphone will become the fundamental banking channel, because it knows more about bank customers than bank advisors, the smartphone goes everywhere its user goes, has the ability to collect data from the user and is already used to make purchases and payments.

2. Trends in the banking world

In recent years, banks and banking operations have undergone significant changes, most of them being (Mitic, 2017):

A. Competition has been a major factor in recent years forcing traditional banks to cut costs and offer new, innovative products on the market. Traditionally, competition has

led to "cost reductions", which mainly involved, including for banks, job losses, but which meant a transfer of costs elsewhere. But currently, competition in the banking market comes from two main sources: first, the entry of new financial intermediaries: non-banks (also known as online banking or banking operating exclusively on the Internet or digital banking, a type of direct bank that operates exclusively online without traditional networks of physical branches and that we find on the market in 2 forms, companies that have applied for their own banking license and companies that have partnered with a traditional bank to provide these financial services) and "challenger banks" (banks that develop modern financial technology practices, such as online-only operations, which avoid the costs and complexities of traditional banking) and, secondly, new technologies that allow P2P transactions (direct between two individuals).

The concepts of challenger ("challenging") and non-challenged (Shawbrook, Metro, etc.) banks have gained momentum in the last 5 years. In addition, organizations normally engaged in other activities have entered the banking market, such as Tesco and Sainsbury's supermarkets, which offer well-established credit facilities and credit cards.

Challenging banks usually try to offer a service (product packages, personal contact, innovative products, good interest rates, etc.) that marks them as distinct from those of traditional banks. Traditional banks try to copy them, both in terms of products and innovation. Many challenging banks can compete because they do not have the high costs (especially staff and rent costs) of traditional banks. Supermarkets are somewhere between traditional and challenging banks. They, in order to attract customers, offer banking services at low costs, have liquidity that they can offer in the lending process and can attach to retail sales, deferred payments, through cards.

The big problem, both of traditional banks, but also of new ones that have entered the market, is that they offer low interest rates on products/deposit, which currently fluctuates around 1, maximum 1.5%, while 10, 20 years ago, subsidized interest rates were several percent, providing the incentive sought by those who save. So new banks are trying to differentiate themselves through a number of less tangible factors, such as convenient location (which could be the internet), an app that "works", or a reputation for quality of service, or eliminate a number of costs, (such as maintenance fees, cash withdrawal fees, or payment fees) which are usually granted by some banks, that have fewer physical counters or only virtual counters and much less staff than traditional banks.

B. Mortgage loans have about the same characteristics, but with the major difference that the terms and conditions associated with negotiating a mortgage are much stricter than they were twenty years ago. The interest rate is certainly a significant factor for borrowers, but so is their credit rating, employment status and overall lifestyle. To some extent, many banks can choose who they lend to and prefer customers with a solid credit record and who are employed (rather than self-employed).

C. Decisions regarding customer requests. The first neural networks for automated credit decision-making were built over 20 years ago, and banks are already using artificial intelligence (AI) to automate repetitive, rule-based manual tasks such as monitoring AML transactions and detecting credit card fraud. However, today, AI is evolving to provide a more comprehensive set of cognitive abilities that can feel, understand, act, and learn. These capabilities allow AI-powered machines to interact more naturally with both clients and other employees. One of the most visible signs of this trend is the emergence of collaborating robots or cobots, who work with people to help them do their job better and provide clients with a better banking experience. In 2016, Bank of America debuted Erica, a smart virtual assistant that uses predictive analytics to provide financial guidance. Some of these robots interact directly with clients, while others support advisors, but in both cases their goal is to help navigate the world of retail investment. As AI becomes a more

visible collaborator, who can make autonomous decisions, there are legitimate concerns about the processes through which an AI makes decisions and whether those decisions are made in the right regulatory and ethical context. For example, Capital One is looking at ways to use AI for a variety of functions, including deciding who gets a credit card.

Significant progress has been made in automated decision-making methodologies in recent years and it is estimated that in the coming years many manual tasks or human decisions will become automated. Innovation in banking decision focuses on the area that takes into account the previous experience of bank clients and their history:

- approval of new accounts, new loans, including mortgages, in many cases these processes being purely deterministic and to which the computer can say YES or NO, based on the analysis of data submitted by the applicant;
- improving "robo" advisors or even their sophistication and placing them in new services such as investment consulting, using algorithmic response models and building on the learning experience of previous cases;
- the use of computer systems that can "learn" from the data collected by banks about clients and their financial behaviour or that can detect fraud, identifying unusual transactions, patterns and styles.

D. Blockchain technologies were originally designed to avoid banks and regulation, so, curiously, banks are beginning to use them. An internet search on the keyword blockchain results in thousands of articles, most of which hail it as a method that will revolutionize banking. Most explanations of how the blockchain works resort to jargon and for is quite difficult for the uninitiated to understand, and most are related to bitcoin, a new form of currency used by a blockchain.

The blockchain's foundation is the feeling that banks and other people cannot be trusted. Blockchain is a common public database for recording transactions that does not allow records to be changed at a later date. There is a somewhat elaborate mechanism for doing this (Bradley, 2017).

For example, I want to send you €100 using a secure electronic transfer system and convert euros to a currency called WebMoney (WM). Do not trust me: do I really have €100? All our friends check to see if the amount really exists. If they want to. Everyone knows about all my transactions. The first who manages to verify the transaction, is paid. That person tells everyone that the transaction is okay and anyone can check the result. Free of charge! If the majority are satisfied, you receive the money and can convert WM to €. Things cannot change after that, and payment details are shared with everyone. WebMoney (WM), from the previous example, can be bitcoin (or any other virtual currency). Bitcoin is a virtual currency ("crypto"), whose total offer is determined by a mathematical algorithm and not by a sovereign state. It can be exchanged with other currencies, but is extremely unstable and therefore unsafe as a means of payment. There are some arguments as to whether or not it is an authentic currency (Guadamuz, Marsden, 2015). Blockchain proponents emphasize the following advantages.

 Trust - there is no "trusted intermediary" (bank);

 Security - communication uses cryptography with public keys, currently the most secure method, because the records cannot be modified later (they are immutable);

 The blockchain database is distributed to all users (additional security);

 Transactions are visible to all, which implies interoperability and transparency;

 There is a complete audit trail because each transaction has a fixed link to a previous transaction.

However, there are considerable issues associated with blockchain, such as:

 It is inefficient. First, verifying blockchain transactions requires considerable energy, as the verification process is a competition in which many participate. Aste (2016)

estimates that a single check needs about 1GW per second, costing about $ 5 per transaction. Second, several parallel verification attempts are inherently ineffective: only one is strictly necessary;

 A distributed database is not practical if the database is large, i.e. it cannot be scalable. The current size of the Bitcoin database exceeds 100 MB (Bitcoin 2017);

 There is a FOREX risk when buying and selling cryptocurrency, as they are unstable, exchange rates can fluctuate wildly;

 Transactions are not always verified within a time (nominal window) of 10 minutes. So transactions can be "blocked" for days, and some are never checked because there is no incentive for other users to do these checks, relative to earnings and costs;

 Blockchain is not safe, the press has spoken frequently in recent years about fraud and theft that lead to financial losses for holders of virtual currencies, which cannot be recovered, because there are no checks on how money enters or leaves the blockchain;

 If you lose your blockchain password, it is impossible to recover and the money is lost;

 Blockchain is not regulated. A completely non-transparent computer algorithm controls the supply of virtual cryptocurrencies, not a central bank;

 There are indications that blockchain/bitcoin may be illegal. If bitcoin is considered a currency and not a commodity, bitcoin violates Title 31 of the US Federal Code, according to which the USD is the only legal currency of the USA. Moreover, Article 17 of the General Data Protection Regulation (GDPR) (Regulation (EU) 2016/679) gives EU people the right to delete information about themselves, which Blockchain does not;

 Money laundering is linked to the blockchain, the opacity of the system favoring this.

Although we are only at the beginning of studies on the use of blockchain by banks, they will probably use these distributed databases to increase public confidence in banks, but a number of issues remain to be resolved related to the secrecy of operations. Additionally, the technology can be used in the field of payments and transactions, but in this case, how will the secrecy and security of operations be ensured.

E. Peer-to-peer transactions. Peer-to-peer (P2P) transactions are usually loan agreements between two people, without the electronic "baggage" of the blockchain. (Lewis, Roberts, 2020) The lender generally obtains a higher (but riskier) return than from a traditional savings bank account, and the borrower has to pay a higher interest rate than if they had borrowed from a bank. In some countries, P2P loans are regulated and, since 2009, there has been an increase in P2P loans, and there is certainly momentum to continue their growth amid mistrust of traditional banks, given the periodic liquidity crises or the independence of bypassing banking regulations. As clients familiarize themselves with the Internet and the virtual world, banks are likely to lose significant volumes of population and SME lending, especially short-term lending, with P2P-type financial transactions being a substitute, as they adapt to the needs of the creditor and the debtor, involves less bureaucracy, regulation and control and attracts undervalued resources from banks in the financial circuit, due to their modest size, sub-bank availability terms and, perhaps, distrust of asset holders in banks. The success of P2P networks is evidenced by other sectors, such as transport, social economy, which will soon be transition into the financial sector. I do not think that the banks will be affected by the losses in this area, because they were risky, they meant costs for the banks, if we refer to the creditors from the SME and population category and, in any case, they were not banked to a great degree, if we refer to creditors in P2P networks. The main brake on the success of P2P networks is fraud, theft and money laundering, which will probably lead to higher regulation of the sector.

F. Security innovations. The security of operations is important for banks, because if it is not ensured, it affects their reputation, clients become reluctant to conduct operations and expose them to regulatory fines for misconduct. There is a significant link between reputation and conduct risk. In recent years, banks have made efforts to improve security measures, in particular by using biometric data (fingerprint, facial recognition or voice recognition). Biometric techniques are fast, accurate, and do not require remembering or writing down passwords and PINs (in fact, typing passwords and PINs may violate bank account terms and conditions). However, clients should not be too afraid, as banks are responsible for any fraud, unless they can prove that a client was careless. So, if technologies lead to an increase in fraud, it will be the banks that will have to increase the bill and not the customers.

And another but, as the client is assured that the counterparty with which they communicate is, indeed, the bank and not a fraudster. So the bank also needs "biometric" recognition.

G. Changing the type of banking crime. The changing nature of banking, especially the shift from physical agency banking to online banking, has also changed criminal activity in terms of banking. Physical, "traditional" bank robbery has declined. The decline of traditional bank robbery is attributed to improved branch security (more cameras, screens), less money held in branches, closer cooperation between banks and the police, and better staff training. In contrast, the incidence of cybercrime has increased significantly.

H. Security and the law. There is an important difference between cyber robbery and "traditional" bank robbery. With cybercrime, the client is cheated, not the bank. Individual bank accounts suffer, and the loss is not shared by all the bank's clients. Banks can get rid of the responsibility of being the only agent in charge of keeping customers' money safe. In "remote" banking, the customer is also responsible, and this principle is enshrined in the relevant regulations.

The relationship between bank and account holder is governed by the contract (often expressed as "terms and conditions"). Any breach of these terms and conditions allows a bank to avoid compensating a client in the event of cyber fraud. Typically, a breach of the contractual "terms and conditions" may be to tell someone else a PIN or password or write them down on something.

In cybercrime cases where the client does not have a very clear involvement, such as hacking the bank's central computer, the client is protected by criminal law on theft and fraud. Theft is the unauthorized seizure of property from another person, with the intention of permanently depriving the person of property, fraud is the abuse of position or misrepresentation or prejudice to one's rights for personal gain, robbery is associated with a certain degree of coercion (physical force or fear). Cybercrime is not robbery, so it is less serious than a "traditional" bank robbery.

I. Real technologies. (McIntyre et al., 2018) We are at the beginning of the period when extended reality (XR) technologies, including virtual reality (VR), augmented reality (AR) and mixed reality (MR), eliminate the distance between people, information and experiences. With these technologies, brands can create competitive differentiation by simply overlapping the real world with digital enhancements to expand human reality. There are many cases of using these technologies in banking. Real-time 3D virtual learning for investment scenarios, for example, could use immersive animation, simulations, role-playing games, and online instruction to train asset managers to better advise their clients. Virtual recruitment would allow banks to identify, recruit and hire some of the best talent in the world no matter where they live. An augmented reality application run at a branch

could deeply immerse clients in a home buying experience that ends with the completion of a digital mortgage.

In most scenarios, XR creates deeper, more meaningful engagements with customers and therefore a higher performance of the banking workforce. Bankers who responded to the Technology Vision 2018 survey believe it is important to use XR solutions to eliminate physical distance when the bank advisor talks to clients.

For banks, capitalizing on the benefits of XR will involve using the ever-increasing volumes of data available to better understand and delight clients and create unique sales opportunities. For example, Hana Bank in the Republic of Korea offers instant mortgages delivered to clients through augmented reality applications on mobile phones. Using big data, the application can obtain information about an apartment, house, block of flats or neighbourhood and can connect it with client data. Aiming the phone camera at a property gives the client not only its price, but also a real-time offer for a mortgage. The price of the house and risk assessment have already been done, and the client can also apply for a digital mortgage, meeting physically only to sign the mortgage documents.

3. Open Banking

The new bank will move along three coordinates: microservices, blockchain networks and the effects of the revised payment services directive, known as PSD2 - Payment Service Directive 2.

A. **Microservices** can be thought of as an approach to IT architecture used by banks. Unlike the monolithic design of traditional banking information systems, the microservices-based approach breaks down applications into simple components that perform distinct functions. Each function is treated within the organization as a unique service, which manages its own data. This eliminates much of the complexity found in traditional banking IT architectures, allows for the inclusion of services (microservices) outside the organization, applications become easy, modular and scalable, and the customer can access only those microservices that interest him.

B. **Blockchain** is today one of the most discussed topics in the financial services industry. It is a distributed ledger (DLT) technology that stores groups of transactions ("blocks"), then links them and sequences the list of transactions using cryptography. However, the real innovation with blockchain is that no organization owns the blockchain property, which is distributed in a peer-to-peer network, with redundancies in blocks and consensus mechanisms to ensure that no one can manipulate transactions. Blockchains can be public, such as Bitcoin or Ethereum, can be developed privately or by consortia.

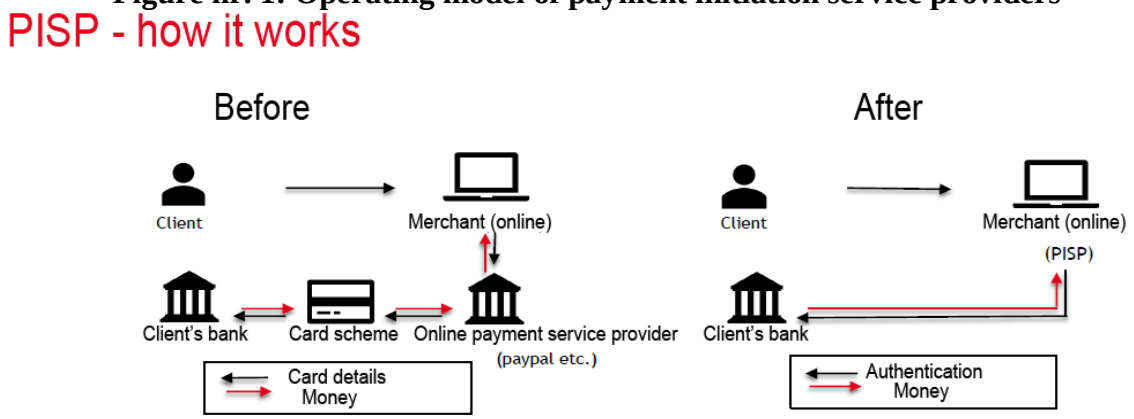
C. In October 2015, the European Parliament adopted a **revised payment services directive, known as (PSD2 - Payment Service Directive 2).** Thus, the new rules included aim to promote the development and use of mobile payments through open banking services, such as "open banking". At the same time, banks are required to give companies that create banking IT solutions access to their payment infrastructure - application programming interfaces (APIs) - and customer data, up to the level of account transactions (payments and receipts).

Hence the phrase "open banking", which is a term for financial services, part of financial technology that refers to the use of APIs (application programming interface) that allow third-party developers to build additional services or applications that support banks or that become their competitor. Open Banking thus offers greater financial transparency for account holders, ranging from open data (already available as public information) to private data.

These third-party developers (Anton, 2018), generically called “TPP” - third-party providers, can be non-banking institutions, FinTech companies or merchants that can be

authorized as payment service institutions. TPP is divided into two groups: Account Information Service Providers (AISP) and Payment Initiation Service Providers (PISP).

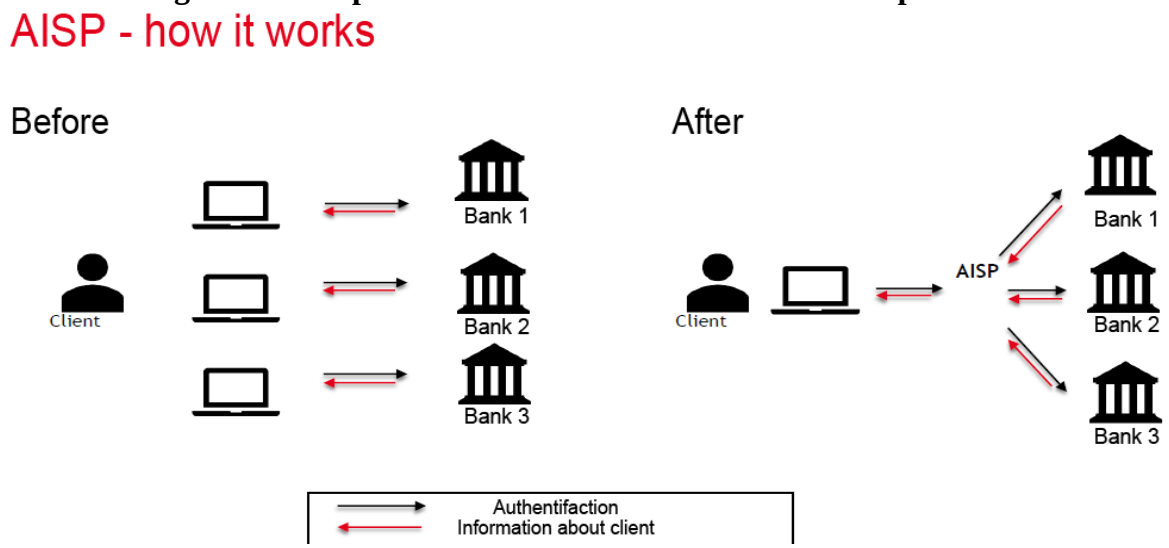
Figure nr. 1: Operating model of payment initiation service providers



Source: Anton, 2018

The introduction of PISP in payment schemes is an essential change in the banking industry, because bank transfers were made only by banks and electronic money/card issuers before this directive. Thus, by authorizing that PISP, merchants can, with the customer's consent, access their account data, and online shopping settlement can be made directly by the merchant, as PISP, based on customer acceptance, without the intermediation of a card and without the call to another payment processor.

Figure nr. 2: Operation of account information service providers



Source: Anton, 2018

AISPs are providers that access bank accounts and extract information about the availability of these accounts, based on the explicit consent of account holders. If the client has several bank accounts, the AISP services will allow them to access data about their accounts held in one place. AISP can also analyse the customer's financial behaviour, based on data about his accounts and make recommendations for streamlining transactions.

Third party providers (TTPs) must be licensed as payment service providers (PSPs) and have the right of establishment and freedom to provide services in order to provide

services throughout the European Union on the basis of the authorization received in the country of origin.

PSD2 is improving its security policy and is intended as a means of reducing risks, in order to protect customers against fraud and the illegal use of sensitive and personal data.

It is obvious that PSD2 is an acknowledgement of the "FinTech" revolution on the payment services market and that it eliminates banks 'monopoly on customers' banking data. In fact, PSD2's goal is to remove barriers to the payment services market, forcing banks to provide access to bank account information to third parties.

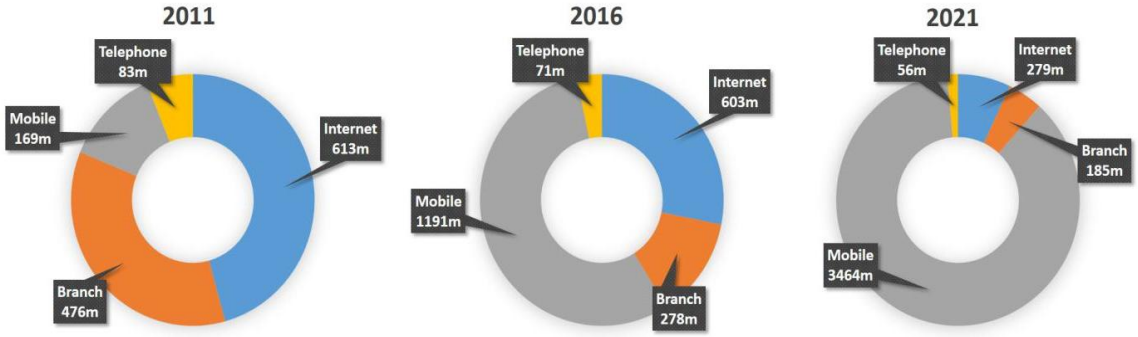
And banks will take advantage of the new regulations by expanding the range of services. The new payment methods are considered will become popular through the connection with social networks, moving to instant payments: we see an advertisement on, say Facebook, we want our product, we put it in the cart, we allow Facebook to access our bank account, and through biometric data (fingerprint, facial recognition, etc.) we accept payment to the merchant. No complications, no IBAN or other codes, no bank card. And an intermediate conclusion, CARDS' DAYS ARE NUMBERED.

For PSD2 client it will mean access to innovative payment services at merchants, alternative cards, access to all bank accounts in a single application, efficient use of information about account turnover, investments, comparative analysis of payment service costs, bank fees , instant payments to merchants or service providers.

4. Future business models of banks

The advent of digital banking (also known as Neo-banking) has changed banking techniques quite a bit, and the use of mobile phones will change them even more. (Oracle Financial Services, 2017).

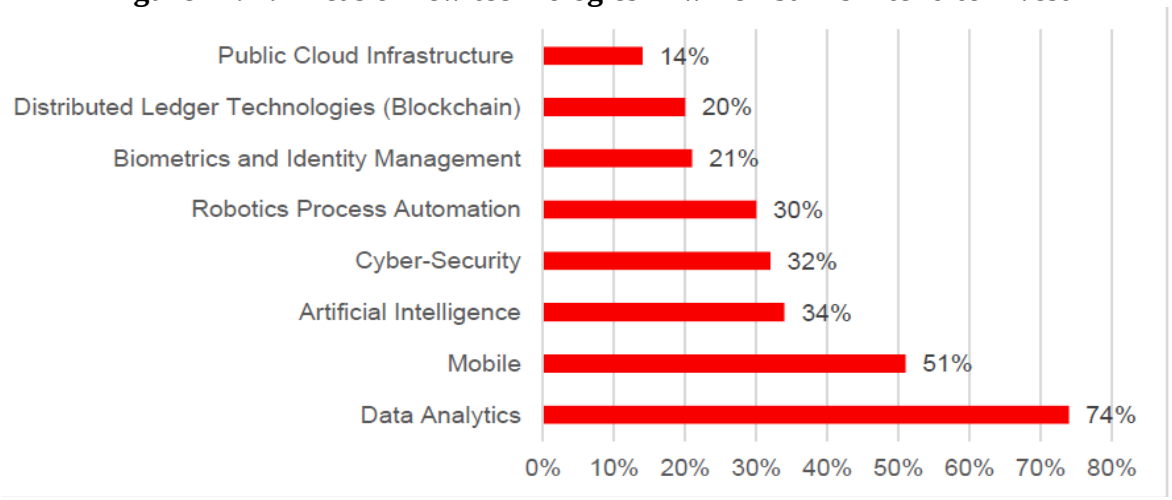
Figure nr. 3: Dynamics of bank interaction channels



Source: Oracle Financial Services, 2017

The increase in mobile phone use (Figure no. 3) for financial transactions was determined by the introduction of banking applications specialized in banking services such as payments, deposits, account opening, credit monitoring, personal finance management, customer support, etc. This mobile banking revolution has also opened the door to innovation, enabling FinTechs to work with traditional banks and deliver better products and services. The future of banking lies in the convergence of technology and people. Today, there is an unprecedented level of interconnection between people, organizations and devices that give rise to a new hyper-connected world.

Figure nr. 4: Areas of new technologies in which banks intend to invest

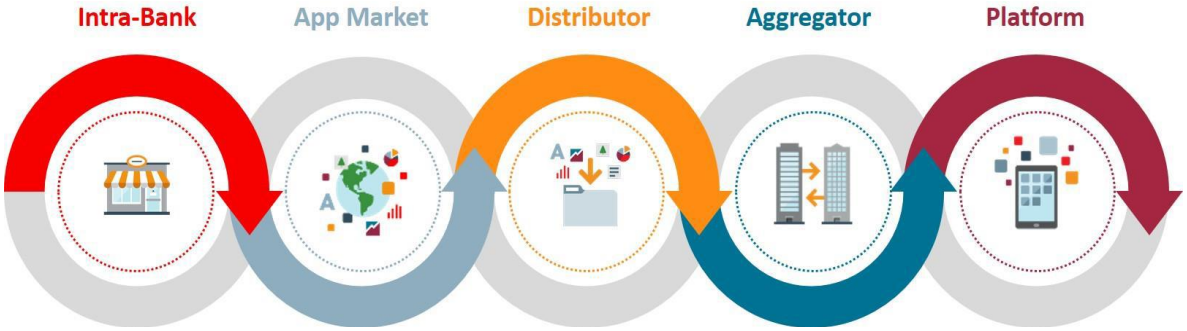


Source: Oracle Financial Services, 2017

Banks have begun to invest in innovation labs, which help them stay focused on using technology to meet their customers' needs and navigate current and future technology waves. In Figure 4, we can see that most banks are willing to invest in technologies for data analysis, mobile and artificial intelligence. Banking business models that keep technology in the spotlight will in turn help banks keep clients at the centre of their business. Technology-driven banks will have the ability to leverage new innovative approaches to deliver highly relevant personalized experiences that are otherwise a challenging task for banks.

As the banking sector becomes completely absorbed in new technologies and regulations, new possibilities for innovation are emerging. This adoption of technology and regulations has encouraged the banking industry to pave the way for new banking business models. Banks must decide the role they want to play in the future, making a decision on the banking business model that best suits their requirements. In Figure 5 below, we can see the five different types of business models that banks can choose in the future.

Figure nr. 5: Future business models of banks



Source: Oracle Financial Services, 2017

The intra-bank model. In this model, banks continue their operations traditionally in which they manage their own products and services and delivery channels. The manufacture and distribution of all their products and services is managed exclusively by the bank.

The application market. In this model, banks expose their data to third-party developers through open APIs. This opens the door for the entire banking system to

intervene and innovate and the bank can turn to third-party developers when API releases take place.

Distributor. In this model, banks stop developing products and services and focus only on the distribution aspect. Banks can also plan to integrate external services with their own offerings. In other words, banks collaborate with third parties, contain products or use the third party product directly and then distribute it through their own existing channels, such as mobile and the Internet. The bank that adopts this model of distributor may also benefit from the possibility of becoming a third party supplier for other banks.

Aggregator. The bank starts operating by aggregating multiple APIs from financial service providers into a single API. In other words, the bank no longer creates financial products and services, these being provided by other partners, it only unites them in other more or less complex applications.

Platform. In this model, the bank offers an open banking platform, exposing their APIs to other institutions. In other words, banks will now give permission to other companies to develop applications and to collaborate and serve customers.

5. Bank of the future and customer behaviour

The bank of the future also brings changes in customer behaviour (Jeffrey, et al., 2018). Banks have been taking people out of their businesses since 1969, when the first ATM began operating at Chemical Bank in Rockville Centre, New York, allowing customers to perform basic banking tasks without physically entering a bank. The process continued, online and mobile banking services accelerated the change, eliminating even more human interaction, because now the bank has become just another application on your smartphone.

Banks have never had to work very hard for their money and, as a result, they have rarely met their customers or provided them with very good services. We actually use the bank because we have to, and if we were to move our account to competition, the changes would not be radical. About the same operations, about the same costs.

For a growing number of people, the bank is no longer the place where you make money, where you earn something. The interest rates offered are almost invisible, generations under the age of 35 in the US or Western Europe, have not seen an interest rate higher than 1-2% on deposit accounts throughout adult life. They believe that banks make their money by attracting customers with unfair and onerous fees.

Most customers under the age of 40 have moved to online banking, they carry out most of their banking activities via computers, iPads and especially smartphones and report that they rarely visit bank branches. Anyone who visits a branch sees fewer people than in previous years and most are over 60 years old. And because most customers are comfortable with (and prefer) online banking, and because most banks' online services look the same, it's very easy to get customers to look at the online companies they know and trust as alternatives to their banks. That's why in the minds of most people projects like Google Bank, Apple Bank, Facebook Bank, Amazon Bank seem to be successful since launch.

I bring up Google, Facebook, Amazon, Apple because they are giants, their annual business is in the order of billions of USD, they know details about customers, about their buying behaviours and habits, and the liberalization of the banking services market would allow them to offer payment accounts, own cards and even low value loans and certainly banks would lose significant market shares.

6. Conclusions

At present, competition in the banking market comes from two main sources: firstly, the entry into the market of new financial intermediaries: non-banks (also known as online banking or a bank operating exclusively on the Internet or digital banking, is a type of

direct bank operating exclusively online without traditional networks of physical branches, that can be found on the market in 2 forms, companies that have applied for their own banking license and companies that have partnered with a traditional bank to provide these financial services), and "Challenger banks"

Although studies on the use of the blockchain by banks are only starting to appear now, they will probably use these distributed databases to increase public confidence in banks, but a number of issues remain to be resolved related to the secrecy of operations. Additionally, the technology can be used in the field of payments and transactions, but in this case how are the secrecy and security of operations ensured.

As clients familiarize themselves with the Internet and the virtual world, banks are likely to lose significant volumes of population and SME lending, especially short-term lending, with P2P-type financial transactions being a substitute, as they adapt to the needs of the creditor and the debtor, involves less bureaucracy, regulation and control and attracts undervalued resources from banks in the financial circuit, due to their modest size, sub-bank availability terms and, perhaps, distrust of asset holders in banks.

In recent years, banks have taken measures to improve security measures, in particular by using biometric data (fingerprint, facial recognition or voice recognition).

The new bank will move along three coordinates: microservices, blockchain networks and the effects of the revised payment services directive, known as PSD2 - Payment Service Directive 2. PSD2 is an acknowledgement of the "FinTech" revolution on the payment services market, and it eliminates banks 'monopoly on customers' banking data. In fact, PSD2's goal is to remove barriers to the payment services market, forcing banks to provide access to bank account information to third parties.

This adoption of technology and regulations has encouraged the banking industry to create new banking business models: the intra-bank model, the application market, the distributor, the aggregator, the platform.

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SOME DIRECTIONS OF ADAPTING THE TAXATION TO FAVOR THE STABILITY AND COMPETITIVENESS OF THE ROMANIAN COMPANIES

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Abstract: *This paper proposes several directions for adapting taxation to promote the stability and competitiveness of Romanian companies, directions that have as a starting point the current situation in Romania, from a fiscal perspective. These directions include: increasing tax revenues to the state budget (in this context we present comparative aspects on the situation of tax revenues in Romania and the EU), increasing the level of collection, stimulating investment in research and development through fiscal facilities, increasing tax compliance, fiscal predictability. In this regard, we used data provided by World Bank reports, the Fiscal Council as well as the report prepared by the World Bank and PwC, Doing Business.*

Keywords: *taxes, tax revenues, tax complience, shadow economy.*
JEL Classification: *H 25, H32.*

1. Introduction

Competitiveness, at country / sector / firm level, means productivity, labor force, investment, friendly environment in which the respective entity operates. Taxation influences all these factors. Trust in the tax system is an essential condition for investors, predictability being one of the most important factors influencing investment decisions.

We consider that the fiscal policy in Romania needs more stability, transparency and predictability, and the administrative burden for taxpayers must be reduced by streamlining and computerizing the tax administration system in order to reach a fast and flexible fiscal system that will lead to improving the taxation contribution to Romania's propulsion in the international tops of competitiveness. A less excessive bureaucracy, encouraging investments, as well as facilitating an efficient and coherent dialogue between tax authorities and taxpayers could be other pluses in increasing Romania's competitiveness.

Therefore, in order to ensure the stability and stimulate the competitiveness of the Romanian companies, it is necessary, first of all, that the tax revenues to the state budget to increase. This can be achieved by: increasing the level of collection, encouraging fiscal compliance, through measures leading to a reduction in the labor cost, reducing the underground economy, encouraging investments.

2. Increasing tax revenues in order to reduce the disparities compared to EU Member States

Romania records the lowest budgetary revenues among EU countries (% of GDP), being ranked in the penultimate place, only Ireland recording a smaller proportion. Among the causes are the reduced taxation (through the fiscal relaxation measures adopted lately, in order to attract foreign capital), the problems related to tax compliance, or granting a multitude of deductions and exemptions from the payment of taxes.

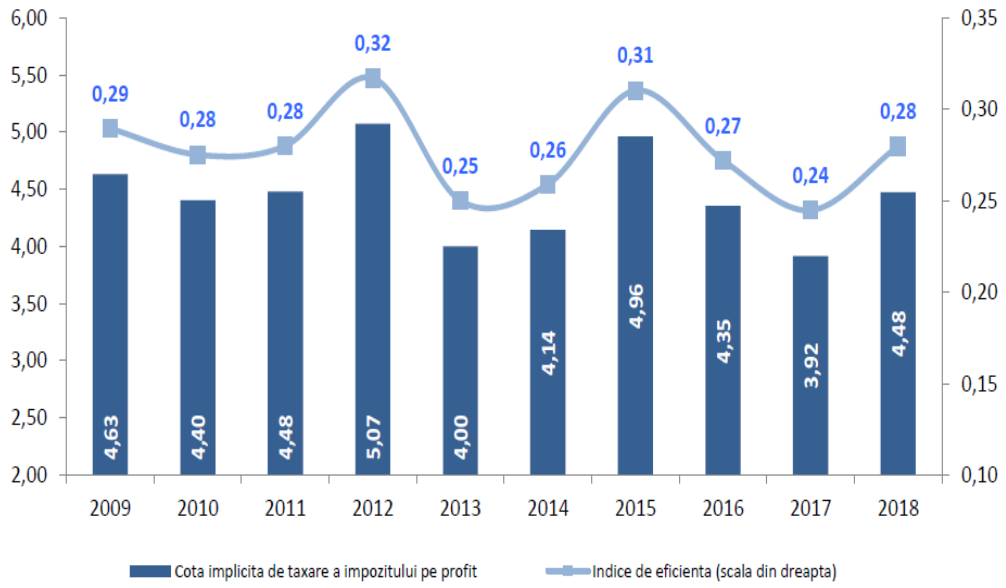
In 2018, our country recorded a level of budget revenues of 32% (share in GDP), below the European average of 45% of GDP. The level of tax revenues (taxes and social contributions) reported to GDP in Romania reached 26,7% of GDP in 2018, still being in the penultimate place (EU average – 39,9% of GDP). The main problem we consider it is that of collection. The improvement of the collection implies the structural development of

the economy, the efficiency of the use of fiscal policy instruments (deductions, exemptions, etc.), but especially the increase of the degree of fiscal compliance.

Compared to other countries with economies similar to Romania's, the share of tax revenues in GDP is significantly lower than Hungary (37,4%), Slovenia (36,7%), Czech Republic, Poland (36,0%) or Bulgaria (29,5%).

Low share of tax revenues in GDP compared with the EU average has multiple causes, among which is the decreased level of tax compliance, imposing lower tax rates than those in other Member States, in some areas, or offering deductions and exemptions, all of which affect the level of tax revenues and collection efficiency.

Figure no.1. The evolution of the implicit tax rate and of the efficiency index of the collection related to the profit tax in Romania



Source: Fiscal Council, 2019, Annual Report 2018

The efficiency index of tax collection paid by enterprises recorded the highest value since the post-crisis period in 2012 (due to the resumption of economic growth in 2011), followed by a significant decrease in the next two years. In 2015 there was an improvement in the efficiency of collection, the index approaching the level recorded in 2012, but temporary, because, due to the reduction of income tax revenues, the index decreased in the next two years, in 2017 being recorded the lowest value from the whole analyzed period.

In 2018, the efficiency index of tax collection paid by enterprises increased from 0,24 in 2017 to 0,28, due to taxes paid by enterprises, compared to the previous year. Given that the income tax revenues increased slightly compared to 2017, the improvement in collection efficiency is most likely due to the evolution of other categories of revenues (for exemple, from the income tax of micro-enterprises), as well as the evolution of tax payments made by enterprises to other beneficiaries than the Romanian state.

The efficiency of profit tax collection has improved in 2018 compared to previous years. In the table below we present the situation compared to other states.

Table no. 1. Efficiency of collecting profit tax

State	Legal profit tax rate			Implicit tax rate			Tax efficiency index			Position		
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Bulgaria	10	10	10	4,6	5,1	5,1	0,46	0,51	0,51	1	2	1
Czechia	19	19	19	7,0	7,1	7,0	0,37	0,38	0,37	2	3	3
Estonia	20	20	20	4,4	4,0	5,3	0,22	0,20	0,26	10	10	8
Letvia	15	15	20	4,5	3,7	3,4	0,30	0,24	0,17	5	8	10
Lithuania	15	15	15	3,5	3,3	3,4	0,24	0,22	0,23	8	9	9
Hungary	19	9	9	6,0	5,2	3,8	0,31	0,58	0,42	4	1	2
Poland	19	19	19	4,4	4,7	5,2	0,23	0,25	0,27	9	6	7
Romania	16	16	16	4,4	3,9	4,5	0,27	0,24	0,28	6	7	5
Slovenia	17	19	19	4,3	4,8	5,2	0,26	0,25	0,27	7	5	6
Slovakia	22	21	21	7,0	7,2	6,5	0,32	0,34	0,31	3	4	4

Source: Fiscal Council, 2019, Annual Report 2018

Therefore, Romania is ranked on fifth position in 2018, at a short distance from Slovenia (0,27), Poland (0,27) and Estonia (0,26), which occupy the following places. On the other hand, Bulgaria (0,51) and Hungary (0,42) remain in the first two places, at a significant distance from the other states.

At the level of 2018, there is a slight general tendency to improve the efficiency of collecting the income from the taxes paid by companies, five of the ten analyzed states recording increases of the efficiency index, while Bulgaria remained at the level registered in the previous year.

Regarding the considerable decrease of the efficiency index in the case of Hungary, this is due to the reduction of the profit tax rate from 19% to 9% (starting with 2017), which caused a significant increase of the index in 2017 due to the achievement of some income from the profit tax calculated on the old rate of 19% (result of a fiscal facility granted to the companies that allowed them to postpone the payment of the profit tax).

3. Efficiency of tax system

The process of simplifying the tax system and reducing bureaucracy has gradually taken place, the recognition of these advantages being highlighted by the World Bank's Doing Business report - the Paying taxes indicator made by PricewaterhouseCoopers.

Thus, the latest available report, Paying taxes 2020 (with 2018 as reference year), ranks Romania, from the perspective of ease of paying taxes, on 32 position within 190 countries analyzed, a much better position, compared to the previous year (position 49). Compared to last year, in 2017, the number of hours required to pay taxes remained the same (163 hours), as did the number of annual payments a company must make to pay taxes (14 payments), and the share of taxes in total profit decreased to 20% compared to 40% (due to the change in the tax regime of social contributions).

The positioning of Romania in 2018 in the first part of the global ranking of Paying Taxes 2019 is a positive result, but maintaining a leading position implies efforts to continue investments in fiscal infrastructure and technology, because the digitization of financial reporting processes has the potential to streamline the internal processes. of tax authorities, including the control and verification mechanisms, also for the benefit of taxpayers.

Table no. 2. . Efficiency of tax system

year	EE	LV	SI	LT	BG	SK	PL	CZ	HU	RO
Ease of paying taxes (position)										
2016	14	13	58	18	90	48	51	53	93	**42**
2017	14	13	41	18	92	48	69	45	86	**49**
2018	12	16	45	18	97	55	72	53	56	**32**

Number of annual payments to pay taxes										
2016	8	7	10	11	14	8	7	8	11	**14**
2017	8	7	10	10	14	8	7	8	11	**14**
2018	8	7	10	10	14	8	7	8	11	**14**
Number of annual hours required to pay taxes										
2016	50	169	245	109	453	192	290	248	277	**163**
2017	50	169	233	99	453	192	334	230	277	**163**
2018	50	169	266	95	441	192	334	230	277	**163**
Total rate of taxation (% of profit)										
2016	48,7	35,9	31,0	42,7	27,1	51,6	40,5	50,0	46,5	**38,4**
2017	48,7	32,6	31,0	42,6	27,7	49,7	40,7	46,1	40,3	**40,0**
2018	47,8	38,1	31,0	42,6	28,3	49,7	40,8	46,1	37,9	**20,0**

Source: World Bank, Doing Business Reports, 2018-2020

4. Tax compliance and fiscal predictability

There are still significant differences between EU countries in terms of tax compliance costs. The complexity of the tax systems, the high level of compliance costs and the lack of fiscal security consume productive resources and act as a barrier to business and investment. The high level of tax compliance costs mainly affect SMEs.

Compliance costs come mainly from the time spent on this task, and they are not direct costs, such as accounting costs.

In order to improve the business environment, the reform of the tax systems can target the following:

- simplification and reduction of tax obligations, in particular for emerging entrepreneurs and smaller enterprises,
- extending the range of electronic services and making them available in one-stop shops,
- conducting awareness-raising, information and advisory actions for taxpayers (the companies), in order to help them comply with tax regulations, including through social communication channels.

Harnessing the opportunities offered by innovative new economic models is important to prepare tax systems to meet the challenges of the future. EU countries are increasingly relying on digital integration to facilitate tax compliance and are encouraged to further simplify and clarify the application of tax regulations in the case of the collaborative economy. They are also encouraged to facilitate and improve the collection of taxes by exploiting the potential of collaborative platforms, which are encouraged to cooperate with national authorities.

The clarity, stability and predictability of tax law, as well as its implementation and interpretation are essential conditions in investment decisions. Any changes to the legislation, including its interpretation, should be adopted after consultation with the business environment and properly applied by the tax authorities, only for the future, and not retroactively.

Referring to the obstacles that they face in the development of business (according to the study conducted by E&Y, 2019, The Entrepreneurs speak. The barometer of the business environment), the first ranked is the fiscal and legislative uncertainty, followed by the lack of political stability and the vision of the public policies and bureaucracy. Thus, the most important obstacles in the development of business for the boards of directors and executives in Romania relate to the public policies and factors controlled by the state institutions. Other obstacles are the lack of entrepreneurial education and difficult access to finance.

Regarding the effects of the frequent legislative changes, beyond the feeling of uncertainty induced in the market, they consisted of the fluctuation of the exchange rate, the restriction of the extension of personnel, the negative impact on the profitability of the company by increasing the expenses with the employees and by the lack of investments, the reluctance of the clients to incur expenses, additional costs of complying with the new tax measures, or impairing corporate governance and redirecting profit to dividends, rather than investments. In conclusion, all these effects lead to a decrease in the competitiveness of the Romanian companies.

When we talk about fiscal unpredictability, we exemplify the fact that in the first 6 months of 2019, the legislative framework was majorly modified, being adopted 614 normative acts: 120 Laws, 4 Government Ordinances, 46 Government Emergency Ordinances, 444 Government Decisions, to which are added the orders of ministers.

We believe that in Romania there is a need for stability, transparency and predictability, and the administrative burden on the shoulders of taxpayers must be reduced by streamlining and computerizing the tax administration system in order to reach a fast and flexible tax system that will lead to improving the taxation contribution to Romania's propulsion in the international tops of competitiveness. A less excessive bureaucracy, encouraging investments and even lowering tax rates, as well as facilitating an efficient and coherent dialogue between tax authorities and taxpayers could be other pluses in increasing Romania's competitiveness.

Thus, the changes necessary for Romania to advance in the top of the world competitiveness may be the reduction of the number of taxes and the related payments or the encouragement of investments (through fiscal incentives, as well as by avoiding discouraging investors due to fiscal policy decisions, such as increasing tax rates or the introduction of new taxes).

5. The unitary labor cost

The workforce plays a major role in the functioning of an economy. From a business perspective, this represents a cost (labor cost) that includes, in addition to the salaries and wages paid to the employees, the non-wage costs, in particular the social contributions payable by the employer.

In 2018, average hourly labor costs across the economy (excluding agriculture and public administration) were estimated at 27,4 euro in the EU and 30,6 euro in the euro area. However, the average shows significant differences between EU Member States, with the lowest hourly labor costs recorded in Bulgaria (5,4 euro), Romania (6,9 euro), Lithuania (9,0 euro), Hungary (9,2 euro) and Latvia (9,3 euro) and the highest in Denmark (43,5 euro), Luxembourg (40,6 euro), Belgium (39,7 euro), Sweden (36,6 euro) , The Netherlands (35,9 euro) and France (35,8 euro).

In Romania, firms have the highest percentage increases in labor costs, including wages, compared to the situation across the EU, according to Eurostat (we refer to the percentage increase in wages; in absolute figures, Romanian employees remain among the last EU countries regarding the money they actually receive from employers).

These increases in labor costs were due to the increase in the minimum wage. The gross minimum wage in Romania exceeds the average of the Central and Eastern Europe region. At the same time, it has the highest effective tax rate among the states in the region, of 41,5% (according to the Deloitte analysis, Nov. 2018). The effective tax rate remains the highest, 41,5%, also in the case of a gross salary of 1.000 euro, for which the region average is 27%.

Due to the transfer of social security contributions to the employee and the increases in the gross minimum wage, Romania exceeds the average gross minimum wage

in the region, by 421 euro, surpassing five states. In contrast, the other 10 countries have lower effective tax rates, the average being 21%, compared to 41,5% in Romania.

The Deloitte analysis, based on the calculations provided by the Deloitte network member companies, includes Romania, Bulgaria, Serbia, Croatia, Hungary, Slovakia, Czech Republic, Poland, Estonia, Lithuania and Latvia. In the case of Romania, the value of the minimum gross salary in the amount of 2.080 lei was taken into account. The gross minimum wage varies between 500 euro (Estonia) and 261 euro (Bulgaria), the average being 421 euro.

Table no.3. Comparative situation regarding the effective tax rate of the minimum wage in Romania and Central and Eastern European states

State	Gross minimum wage(euro)	Social contributions of employee	Income tax	Net wage	Social contributions of employer	Total labor cost	Net wage % of gross wage	Effective tax rate(%)
Estonia	500	18	-	482	169	669	96	4
Lithuania	400	63	3	361	125	525	90	10
Czechia	472	52	15	405	160	632	86	14
Slovakia	480	64	18	397	169	649	83	17
Letvia	430	47	37	346	104	534	81	19
Croatia	499	92	-	367	79	537	80	20
Bulgaria	261	36	22	202	51	312	78	22
Poland	485	104	28	354	99	585	73	27
Hungary	426	79	64	283	89	515	66	34
Romania	446	156	29	261	10	456	58	41,5
Average	422	67	21	334	100	522	79	21
Difference RO/ average	24	89	8	-73	-90	-66	-21%	21%

Source: Deloitte, 2018, https://www2.deloitte.com/ro/ro/pages/about-deloitte/articles/analiza-deloitte-salariul-minim-in-romania-prin-comparatie-cu-al-statelor-din-regiunea-europei-centrale-si-de-est.html

The main findings of the analysis were:

- Estonia has the lowest effective minimum wage tax rate of 4%, followed by Lithuania (10%) and the Czech Republic (14%), and Romania, the highest rate, 42%, the average being 21%.
- The effective rate of taxation of a gross salary of 1.000 euro is the highest in Romania (42%), Hungary (34%), Latvia (29%) and the lowest in Estonia (13%) Bulgaria (22%), Lithuania (23%).
- Romania has the lowest level of contributions due by the employer (2,25%), the average being about 23% in both cases.

Romania presents an increase of the average gross salary of about 41% in the last two years. However, if we take into account the effective tax rates, the net minimum wage in Romania drops towards the end of the same ranking. This means that, at the end of the month, the Romanian employee takes the least money "in hand", compared to other countries in the region.

However, it should be mentioned that at the level of the employer, the costs are the lowest in Romania, but they have no impact on the employee. However, in both situations - reported to gross salary and total wage cost - taxes and contributions to public systems in Romania significantly exceed the region's average.

6. Aspects about the shadow economy

A recent analysis by the IMF (Medina, L., Schneider, F., 2018) estimated the level of the underground economy as a percentage of Romania's GDP at 26,3%, for 2016, ranking the fourth place in the EU. The largest share of the underground economy is in Bulgaria, with 29,6% of GDP, but it has made considerable efforts lately to combat these activities.

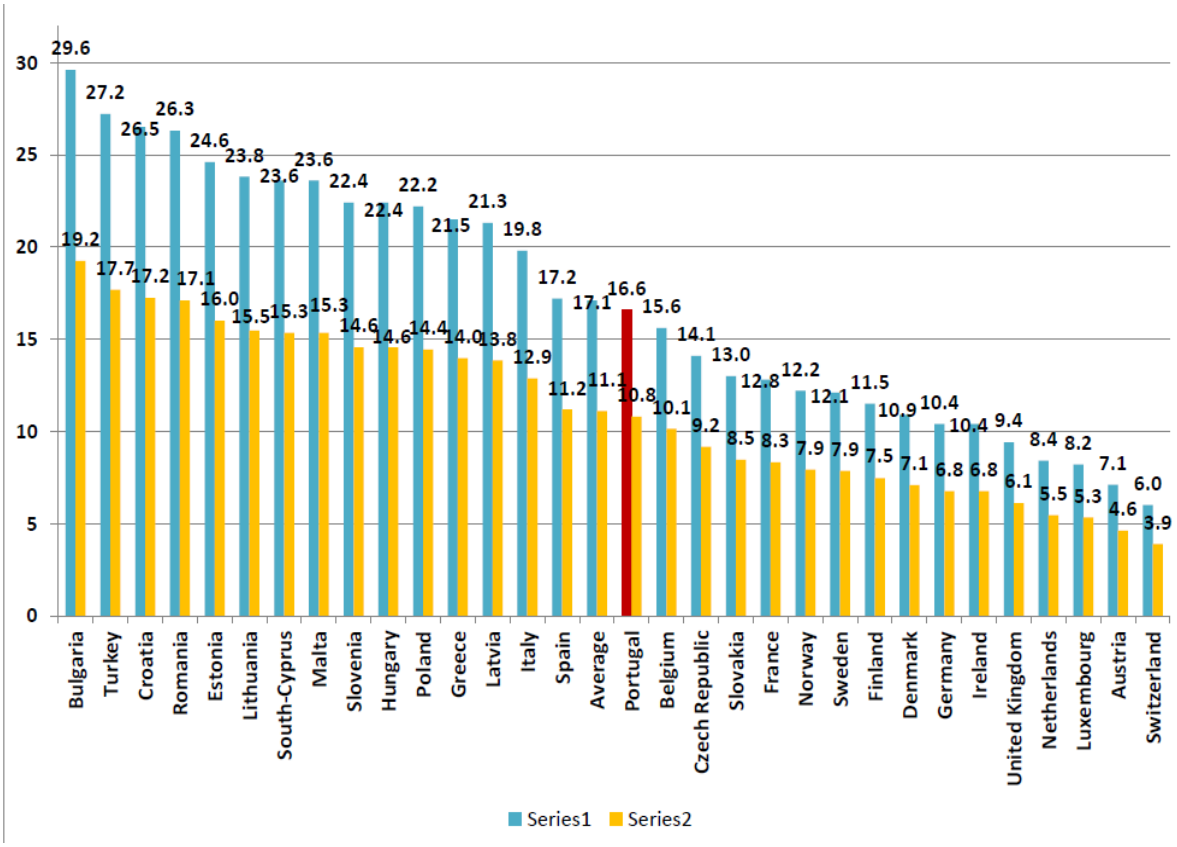
The average size of Romania's underground economy in the period 1991-2015 was at 30,14% of GDP, with a maximum in 1991 of 36,03% and a minimum of 22,73% in 2014. The contribution of the hidden economy in the Romanian economy has decreased significantly since 1991 overall, with slight variations over the years. Since 1991 there has been a downward trend and in 1997 it reached a share of 31,65%. In 1999, it rose by more than three percentage points, to 34,4% of GDP, then returning to a downward trend.

The economic crisis has led to an increase in the size of the informal economy in almost all European states. The contribution of the Romanian hidden economy increased in 2009 to 28,23% of GDP, from 25,44% in 2007, an increase of almost 3 percentage points. After 2009, the share of these types of activities decreased steadily, reaching in 2014 to 22,73% of GDP.

The causes of the size and development of the underground economy are multiple, among them the burden of taxes in general and the tax burden on labor in particular (especially that of social security contributions) being determinant factors for the size of the hidden economy. In Romania, the fiscal burden, the difference between the total costs of the employer and the net salary of the employee, is 36,7%, ranking 7th in the EU and the largest in Central and Eastern Europe. The European average is 32,5% (Ionut Dumitru, 2018, The unobserved economy in Romania - causes and consequences).

Other factors that influence the level of the unofficial economy are: state control over corruption, government effectiveness (quality of public services, quality of social services), rule of law, but also the ability of the government to effectively regulate the economy, so as to enable and benefit the development of the private environment, labor market regulations.

Figure no.2. Shadow economy at EU level



Source: Medina, L., Schneider, F., 2018, Shadow Economies Around the World: What Did We Learn Over the Last 20 Years? IMF Working Paper 18/17

The reduction of the level of the underground economy depends on the same factors that are determinants for its size, but also on the digitization of the Romanian institutions, in particular of the fiscal authority. Also, the level of the taxes on labor, the quality of the public services, the efficiency of the spending of the public money are other factors that would lead to its decrease.

Comparatively, the average size of the hidden world economy is 31,9% of GDP. Of the 158 countries analyzed, the largest share of the underground economy exists in Zimbabwe – 60,6% - and Bolivia – 62,3% of GDP. The lowest rates of this economy are in Austria – 8,9% of GDP - and Switzerland – 7,2% of GDP.

7. Conclusions

We consider that the fiscal policy in Romania needs more stability, transparency and predictability, and the administrative burden for taxpayers must be reduced by streamlining and computerizing the tax administration system in order to reach a fast and flexible tax system that will lead to improving the taxation contribution to Romania's propulsion in the international tops of competitiveness. A less excessive bureaucracy, encouraging investments, as well as facilitating an efficient and coherent dialogue between tax authorities and taxpayers could be other pluses in increasing Romania's competitiveness.

The investments made in the field of research and development represent an important factor that determines the increase of the competitiveness, boosting the employment and compensating for the dysfunctions of the market, contributing, finally, to the development and the economic growth. Therefore, the governments of the different

states have adopted various measures with the purpose of supporting and promoting the activities of the RDI within their own jurisdictions, both by granting subsidies and by providing fiscal incentives.

Therefore, in order to ensure the stability and stimulate the competitiveness of the Romanian companies, it is necessary, first of all, that the tax revenues to the state budget to increase. This can be achieved by: increasing the level of collection, encouraging fiscal compliance, through measures that will reduce the labor cost, reduce the underground economy, encourage investments.

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MONITORING THE ENVIRONMENTAL ASPECTS AS PART OF SUSTAINABLE DEVELOPMENT IN THE OIL INDUSTRY

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Abstract: *The oil industry is among the industries with a high risk of pollution. The potential negative consequences of this indispensable economic activity have similar causes in all the oil regions, its dimensions differing from one area to another, depending on the technologies used and the compliance with the environmental regulations in force. Sustainability of companies in the oil industry means practicing responsible, efficient and innovative management that manages to keep under control and continuously monitor the problems related to possible environmental risks. Monitoring of environmental issues must be integrated into the sustainable development strategy at the level of management of all companies in the field. This paper synthesizes a series of arguments that come to certify the opportunity of integrating environmental aspects, in particular their monitoring, into the strategy of sustainable development of companies in the oil industry.*

Key words: *environment, sustainable development, oil industry.*
Classification JEL: *Q01, Q56, L71.*

1. Introduction

The sustainability strategy must be integrated in the development strategy at the management level of all companies in the field. Managing business responsibly must create long-term value in an innovative and efficient manner. All stakeholders must act to protect the environment and support communities

The overall objective of sustainable development is to find an optimal interaction between four systems: economic, human, environmental and technological. For the model to be operational, this support or viability must be applicable to all subsystems that make up the four dimensions of sustainable development, starting from energy, agriculture, industry, and even investments, human settlements and biodiversity (Bran, 2002).

Monitoring of environmental issues starts from the identification of the current state of the environment and continues with the identification, analysis, estimation and treatment of potential environmental risks.

The attitude of an organization to environmental issues defines the strategy of sustainable development. The main features of this strategy are that it must be documented and implemented in the organization.

Environmental problems management is a component of the general management system, which includes the organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for the elaboration, implementation, implementation, analysis and maintenance of environmental policies.

2. Sustainable development of the industry in the oil industry

Starting from a general concept, sustainable development reflects the idea of development without depletion of resources, by going beyond the limit of sustainability and regeneration of ecosystems. The basis for this concept is the need to integrate economic and environmental objectives and environmental protection.

Sustainability of companies in the oil industry means responsible, efficient and innovative management.

Creating extra long-term value for the company and its stakeholders, respecting the environment, supporting the communities in which it operates and contributing to the

achievement of the ONU Sustainable Development Goals are major, strategic objectives of all companies in the oil industry.

At global level in general and in the oil industry in particular, the main goals of sustainable development are:

1. poverty reduction
2. "zero" hunger
3. health and well-being for all people
4. ensuring a quality education
5. equality regardless of gender
6. Clean water
7. getting clean energy at affordable prices
8. economic growth
9. industrial innovation
10. reducing inequalities
11. sustainable localities
12. responsible consumption and production
13. climate action
14. ensuring the evolution of aquatic life
15. ensuring the evolution of terrestrial life
16. efficient institutions
17. partnerships to achieve the objectives

Figure no. 2. Sustainable development goals

Source: https://en.unesco.org/sustainabledevelopmentgoals

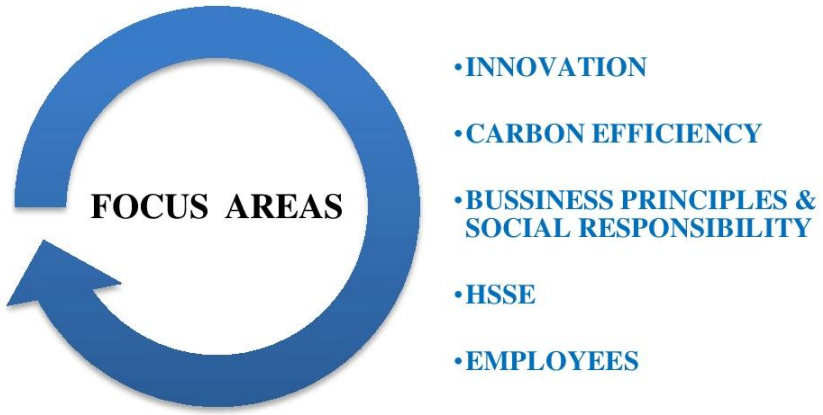
Oil companies focus their sustainability efforts on five areas of interest:

- *Health, safety, security and environment* (HSSE): human well-being and safety, as well as the integrity of business operating facilities and a proactive risk management system
- *Efficient carbon management*: companies need to focus on improving carbon efficiency management in its operations and product portfolio. Companies are

fully committed to acting on climate change mitigation and responsible resource management.

- *Innovation*: efforts are aimed at developing a culture based on innovation, strengthening the digital skills of its employees and implementing new technologies in business.
- *Employees*: Companies place people at the center of business and want to create a job that is satisfying, diverse and learning-oriented.
- *Business principles and social responsibility*: Maintain compliance standards as high as all locations, and the Code of Conduct applies to all employees and suppliers. Companies act responsibly both in terms of the use of natural resources in our operations and in the way in which we build relationships based on trust and honesty with all the actors involved.

Figure no. 2. Areas of interest for sustainable development in the oil industry



Source: Processing after https://www.omvpetrom.com/ro/sustenabilitate

The sustainability strategy must be integrated in the development strategy at the management level of all companies in the field. Managing business responsibly must create long-term value in an innovative and efficient manner. All stakeholders should act to protect the environment and support communities.

3. Monitoring of environmental issues

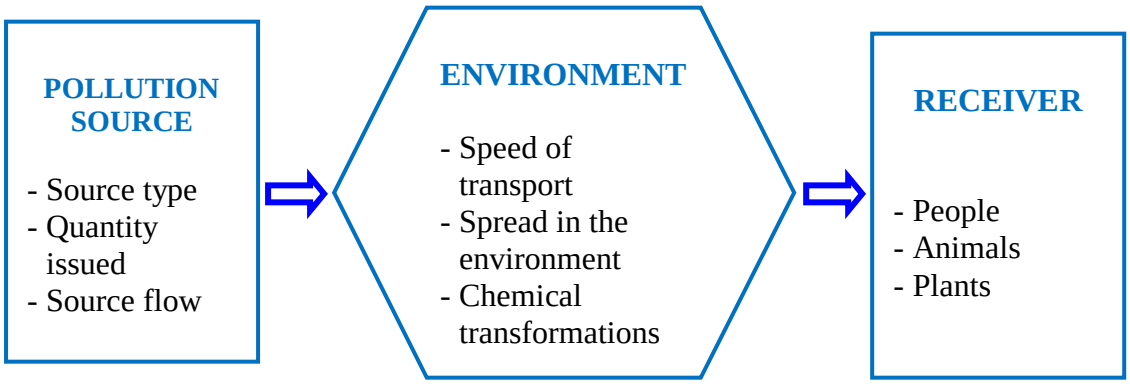
In both its extractive and processing industries, the oil industry is among the industries with a high risk of pollution. The potential negative consequences of this indispensable economic activity have similar causes in all the oil regions, its dimensions differing from one area to another, depending on the technologies used and the compliance with the environmental regulations in force.

Refining, distribution and transportation of oil and petroleum substances can cause pollution to varying degrees of the main components of the environment, terrestrial or aquatic, negatively affecting the vegetation, wildlife and of course, the human (Albu, 2013).

The objectives of the evaluation methodology are set based on a simplified model of highlighting the environmental pollution using the "source-path-receiver" relationship, presented in figure 3. The objectives of the evaluation are:

- establishing the area affected by pollution when the source of pollution is known;
- the detection of the source of pollution starting from the analysis of the affected environmental factors;
- risk assessment on the biotic environment when the pollution level is high.

Figure no. 3. Simplified model of pollution based on the "source-path-receiver" relationship



Source: Albu, 2013.

In order to prepare a pollution assessment and monitoring program, the following criteria are established:

- Reference sample = material sample to identify the state of the unaffected environment and used to determine the accuracy and accuracy of the physico-chemical analysis techniques;
- Alert threshold = concentrations of pollutants in air, water, soil or emissions / discharges, which have the role of warning the competent authorities about a potential impact on the environment and which triggers further monitoring and / or the reduction of pollutant concentrations from emissions / evictions;
- Intervention threshold = concentrations of pollutants in air, water, soil or emissions / discharges, at which the competent authorities will have to carry out the studies of risk assessment and reduction of pollutant concentrations from emissions / discharges;
- Risk assessment = identification and ranking of problems related to toxic emissions and substantiation of quality criteria for the environment.

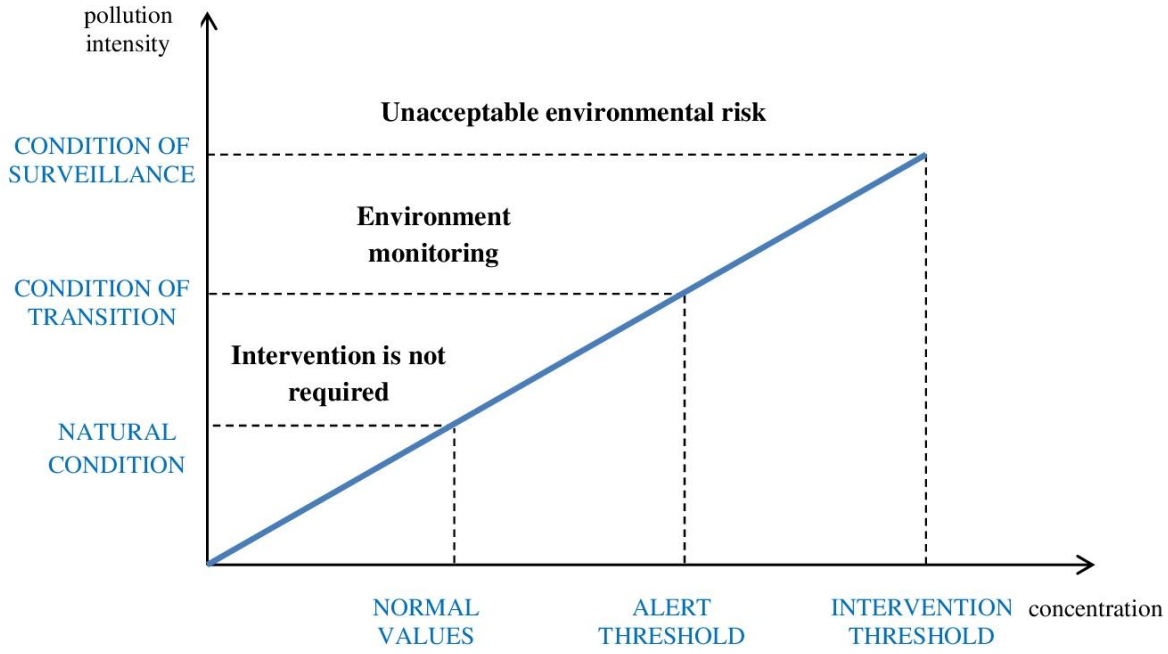
The alert thresholds warn the competent authorities about a potential pollution, and the intervention thresholds are the pollution thresholds when investigating the consequences of environmental pollution (Oţelea, 2012).

In order to determine the degree of pollution of the environment or the risk regarding the intensity of the pollution, the following information must be available:

a) the history of the oil operations in the site and in the surrounding areas;
b) geology and hydrology of the area;
c) drainage of the site or as accurate information about the dispersion in its vicinity;
d) persistence and mobility of pollutants;
e) analyzes of pollutant emissions;
f) the analysis methods available in accredited laboratories;
g) sensitivity of the surroundings and the use of land or groundwater;

h) legislative provisions, political pressures or of non-governmental organizations.

Figure no. 4. Environmental pollution assessment



Source: Processing after Albu, M., 2013. *Integrarea componentei de mediu în strategia companiilor petroliere,* Editura Universităţii din Ploieşti.

In the elaboration phase of the initial investigation program for the assessment of pollution some of this information may be missing, which is why a program of correction is needed during the objectives for substantiating the intervention programs.

Monitoring the environmental aspects determines the establishment of the ecological impact, the direct or indirect effect of a human activity that produces a change in the sense of evolution of the quality state of the ecosystems.

Keeping the impact under control requires a detailed knowledge of the phenomenon, which involves going through the stages of identification, estimation, appreciation, etc. This is what is pursued by the general concept of Ecological Impact Assessment (EIE).

4. Conclusion

For any organization, regardless of the type of products / services achieved, and especially in the field of the oil industry, the integrated approach of the three fields quality, environment, occupational health and safety and in particular the monitoring of environmental issues is a pressing, logical and useful necessity.

In the oil field, the organization of the activity of monitoring the environmental aspects is based on the following principles:

- diminishing the impact of the activities carried out on the environment;
- identifying and monitoring potential sources that generate environmental risks
- making investments to avoid the occurrence of environmental accidents

The implementation of an integrated system of quality-environment-health management and occupational safety, will offer organizations the possibility:

- improving the image of the organization, by satisfying the requirements regarding quality, environmental protection and work safety;
- keeping all the requirements related to quality, environment and occupational health and safety under control;
- improving the relations with the public authorities, the socio-economic community as a whole;
- limiting the civil and criminal liability, by satisfying the legal regulations regarding quality - environment-security;
- connecting the organization to the universally recognized principles and policies (through international treaties, for example) and giving the organization credibility in this regard;
- Providing a common language for internal / external communication of the organization.

All the presented aspects motivate the opportunity to monitor the environmental aspects in the oil industry as part of the sustainable development in this field of activity.

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STRATEGIC PLANNING FOR THE DEVELOPMENT OF PUBLIC TRANSPORTATION

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Abstract: *The aim of this paper is to analyse the impact of strategic planning in the development of public transportation. Therefore, we conduct a short literature review concerning the relation between strategic management, in general, and the development of public transportation, and, more specifically, different aspects of strategic planning in relation to the development of public transportation. We include both theoretical views on the subject and empirical studies in different regions and states which show the effect of strategic planning on the changes related to public transportation.*

Keywords*: strategic planning, strategic management of transportation, transportation development, regional development.*

JEL Classification: *R00, R42.*

1. Strategic management and the development of public transportation

In order to introduce significant sustainable and environmentaly friendly changes regarding public transport, it is necessary to use strategic management, inclusing strategic planning. The literature on this topic is growing, as well as global initiatives for developing public transportation using strategic management tools.

Dimić *et al.* (2016) have proposed a strategic management model for public transportation development with five stages, with associated sub-steps: (1) strategic analysis (which includes strategic analysis conduction, as well as SWOT matrix); (2) strategic options formulations (identifying and valuating impact factors, create strategic options); (3) optimal strategic option selection; (4) selected strategy implementation (determining perspectives, performance, KPI, and creating the strategic map); (5) strategic control (monitoring performance indicators and determining reach statement).

2. Strategic planning and the development of public transportation

In the context of developing public transportation services and solutions, strategic planning can be defined as the process that includes diagnosing transportation organisations' environments (internal, as well as external), making decisions regarding the vision and mission of the organisation, developing short and long-term goals, creating strategies in order to pursue the respective goals and allocating the necessary resources in order to achieve those goals (Obeng and Ugboro, 2008).

Gavrilidis and Metaxas's meta-analysis of strategic planning for city development in Greece has identified a series of outcomes and policies of strategic planning for public transportation. The impact and outcomes of strategic planning include: optimisation of resources, positive visual impact of public spaces, and the improvement of environmental and sustainability issues. Moreover, the effects of strategic planning concerning key strategies include: the improvement of accesibility of public transportation, the growth of capacity of public transportation, the improvement of confort, the protection of the environment, the utilisation of KPIs, the monitorisation and forecast of public transportation, increasing the control of the public transportation's quality, and the increase of the customization (Gavrilidis and Metaxas, 2017).

Other papers in the literature have opted for case studies regarding the transportation organisations use of strategic management. Zohrehvandi and Ghazanfari (2013) have studies the implementation of strategic management at such an organisation and have

identifies several issue, which we consider to be barriers in the actual strategic plannification process. First of all, the environment in which the transportation company operated was highly volatile and unstable, which leads at making medium and long term strategies unusable. Second of all, the mission of the organisation was not clearly defined or correlated with measurable objectives, which also has a negative impact on strategic planning.

The expression of „strategic planning" is growing in popularity in the context of public transportation development, and, in this context, there is a risk of it becoming a catch-phrase without much practical application. Therefore, it is important to identify and implement effective strategic planning steps, which have been summarised by Obeng and Ugboro (2008): the development of action plans at unit or division level and the unification of these action plans into a system strategic plan, the involvement of top-level management, the external orientation (or customer orientation, in this case, the orientation towards the users of public transportation) of public transport, centering the responsiveness of the organisation to the users' needs and demands, and identifying, as well as investing in growth opportunities for the future.

3. Improvement of local infrastructure as a factor for increasing the quality of life and diversification of the rural economy

Infrastructure represents the basic services and facilities serving a country, city or other area, including the services and facilities needed to operate its economy. The infrastructure is composed of public and private physical improvements such as roads, bridges, tunnels, water supply, channels, electricity networks, telecommunications (including Internet connectivity and broadband speeds). In general, it has also been defined as "the physical components of interdependent systems that offer essential products and services to enable, sustain or improve the living conditions of society."

Infrastructure and basic services in rural communities in Romania, including mountain areas, are inadequate both in terms of quality and functionality. They are the main elements that maintain a strong gap between rural areas and urban areas in Romania and, moreover, a hindrance to equal opportunities and socio-economic development of rural areas.

Thus, the development and upgrading of water / waste water systems adapted to standards, network of roads of local interest, to improve connectivity, health services, represent basic needs for the rural population.

Limited access to these is reflected in a low degree of attractiveness of rural space for both entrepreneurs and young people from these areas. The deficiencies resulting from a poorly developed local infrastructure also cause discrepancies in the accessibility of educational forms.

An improved basic infrastructure will create adequate living conditions, development and revitalization of the rural economy while ensuring access to health, social services and education.

Specifically, a centralized water / wastewater infrastructure will improve access to drinkable water and increase hygiene conditions, while improved local roads will increase access to all other services.

Considering the above, the promotion of local development through the LEADER instrument for bottom-up promotion of development initiatives and activities by local communities, having as a starting point the locally identified needs and endogenous potential is necessary and very important. The need to develop in an integrated and

innovative way the issues of local importance, the balanced development of local communities is vital for accelerating the structural evolution of these communities.

Also, the need to strengthen local governance in terms of management capacity needs to be enhanced, as rural stakeholders are better informed and stimulated about the possibility of engaging more extensively in the development of their own local communities.

Involvement of local stakeholders in the development of the areas in which they operate will contribute to the achievement of a dynamic development supported by a local development strategy developed and implemented locally and managed by representatives of the LAG (Local Action Group).

In the basic infrastructure at the level of the territory, investments in the modernization of local roads were made, both by accessing the national and European funds, as well as through the NRDP 2007-2013, LEADER –Dâmbovița South-West Micro-region LAG axis, such as: Modernization of the communal road in the village of Mănăstioara - forest store in the Commune of Uliești; Modernization of local road Uliţa Mangica in Mogosani Commune; Modernization of the Bisericii Street, the village of Puntea de Greci, Petreşti Commune, Modernization of the access road Moara Oancea Nicolae, in the village of Cazaci, Nucet Commune; Modernization of streets in Lucieni Commune.

However, the needs of the territory are increased, development and investment in this area is still needed.

Thus, the local development strategy of the Dâmbovița South-West Micro-region LAG (DBSW Micro-region LAG) came as a consequence and, at the same time, a solution for improvement of the region's infrastructure, the development of non-agricultural businesses, the increase of the agricultural business's ability to enter the market and to resist large producers, to support young people in setting up a business and to apply for high-quality products.

The amount allocated to measure 6 / 6B - Local and social infrastructure is 424,005.98 Euros, money allocated to the development of local public infrastructure for the 16 component localities as well as to social development and support to those categories not directly involved in rural development but which are part of the local community and, implicitly, their quality of life is also reflected in the other categories.

The funds allocated by LDS (Local Development Strategy) for the local development of the DBSW Micro-region are significant and can provide a change and improvement in the rural life and economy of the area, but investment in the development and establishment of businesses must be supported by strong public infrastructure (road, social, health, communications, etc.).

The objectives of SDL of DBSW Micro-region LAG are to support the development of the region on all major plans, namely: supporting farmers to develop and carry out their activities in a shorter time with lower costs, but ensuring high quality products, supporting farmers for vocational training and the development of professional skills, supporting young people to settle in rural areas and earning income from agriculture (Romania being essentially a country based on agriculture and characterized by generations that are too old to meet the ever changing demands of the economy), supporting the achievement of high quality products and encouraging their access to foreign markets, supporting investment in operations of social public interest (nurseries, support of minorities, development of technological education and agricultural schools, etc.). Covering all these sectors will ensure a balanced and sustained development of the region, thus continuing the objectives achieved in the previous programming period.

There is a one-to-one relationship between the transport infrastructure of a region and its economic development.

Since ancient times, the most prosperous regions have either been along major communication routes or at their intersection. The development potential of a region is even greater as that region has a more developed transport infrastructure. Undoubtedly, transport infrastructure is one of the most important factors of national or regional economic competitiveness, alongside tax regime, technological and research infrastructure or the level of workforce training. Reciprocal relationship is also valid. Economic growth leads to an even greater increase in transport needs, creating additional pressure on the existing infrastructure. At European level, traffic is expected to double by 2020, requiring investments in the extension and modernization of trans-European transport networks of around 500 billion Euros in 2007-2020.

Symmetrically, the lack of adequate transport infrastructure can stifle development, and the regional economy is stagnating or even regressing. Difficult access (measured in time and cost) to areas with economic, residential or recreational functions of a region makes that region less attractive both for business and for the population. The high freight transport costs (whether we are talking about raw materials, semi-finished products or finished goods) and the displacement in difficult conditions of people in a certain area are factors that discourage economic investments and lead to the gradual deterioration of that area. Therefore, reducing isolation caused by geographic factors (in the case of predominantly mountainous or island regions), demographic factors (in the case of dispersed populations) or in border areas represents a constant concern of the European Union.

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ASSESING THE EFFECTS OF THE ECONOMIC AND FINANCIAL CRISIS ON INCOME CONVERGENCE IN THE EUROZONE

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Abstract: *The introduction of the single currency within the European continent has represented an unpreceded decision that has brought closer than ever 19 European countries. Although the Euro Area has been founded on strong principles and mechanisms, one of the main concern of the European policy makers derive from the asymmetries that still persist between the Old and New Member States. Moreover, the economic prosperity and political stability of this group was recently threatened by the economic and financial crisis, calling into question the capacity of Eurozone to preserve its unity. The aim of this paper is to examine income convergence in the Eurozone, taking into consideration the evolutions which occurred before and after the outbreak of the economic and financial crisis. In this respect, we have calculated the absolute β- and σ-convergence for the New and Old Member States included in the Eurozone between 2000 and 2018 and during two sub-periods (2000-2008 and 2009-2018), illustrating that the Central and Eastern European countries have been catching-up at the beginning of the 21st century.*

Key-words: *Eurozone, income convergence, absolute convergence, economic and financial crisis.*
JEL Classification: *O40, O47, O52.*

1. Introduction

The establishment of the Eurozone has represented an unpreceded political initiative that has changed the historical path of the regional group. Comprising initially twelve Members, the Euro Area has been considered both by researchers and practitioners and elitist group, formed only by developed countries that proved to have sound monetary and financial determinants. The subsequent waves of accession, together with the economic and financial and debt crises have challenged the stability of a group of countries that seemed to be indestructible. Nowadays, one of the main goal for the Euro Area is to preserve the unity between its Members given the regional and global challenges that have threatened the economic prosperity and political stability. The main purpose of this paper is to study real convergence in the Euro Area, also taking into consideration the consequences of the economic and financial crisis. In this respect, we have tried to examine the evolution of (absolute) β-convergence in two sub-periods (2000-2008 and 2009-2019), illustrating that the catching-up process from the beginning of the 2000s was hampered by the economic and financial crisis. Moreover, we have examined the evolution of σ-convergence, revealing that income disparities diminished both within European Union and Euro Area between 2000 and 2019. The paper is structured as follows. The literature review chapter presents some representative perspectives on the recent developments that took place in the Euro Area, mainly with the accession of the New Member States. Further, we have presented the methodology used in order to test the convergence hypothesis and detailed the main findings. In order to examine the impact of the economic and financial crisis, we have discussed the evolutions that occurred in two sub-periods 2000-2008 and 2009-2019. Finally, we present the main implications of our findings, together with the limitations of our empirical study.

2. Literature Review

Even since its establishment, Eurozone has been considered an elitist group composed only by the European countries with stable economic determinants. One of the key points in the recent history of the Eurozone was the accession of the ex-communist countries from Central and Eastern Europe. In this respect, Slovenia was the first Central

and Eastern European country that adopted the Euro currency and stepped into a new stage of integration. In the following years, other ex-communist states and two Mediterranean countries joined the Eurozone, after accomplishing the nominal convergence criteria. Although initially, analysts have focused mainly on the nominal criteria, as prerequisite of adopting the single currency, the financial and economic and the sovereign debt crises have brought a paradigm change in the mind-set of the decision makers. For all the parties involved, it has become increasingly clear that the set of parameters included in the Maastricht Treaty were not sufficient in order to assure that the economies were ready for adopting the Euro currency.

Recent developments in the European Union have highlighted the persistent disparities in terms of income, labour productivity or competitiveness not only between the New and Old Member States, but also among the members of the Eurozone. Real convergence in the Euro Area has been analysed by Diaz del Hoyo et al. (2007), Christodoulakis (2009), Monfort et al. (2013), auf dem Brinke (2015), Gros (2018), Franks et al. (2018). From the perspective of Franks et al. (2018), countries that initially joined the Eurozone experienced a slowdown in income convergence and even divergence. However, Franks et al. (2010) identified a temporary process of real convergence between the first adopters of the euro that preceded the economic and financial crisis of the 2000s. According to the analysts, the economic and financial crisis had a significant negative impact on the group of states included in the Euro Area, hampering the progresses obtained at the beginning of 2000s. At the same time, Franks highlighted that although income convergence is not a necessary condition for the functioning of the Economic and Monetary Union, it has been and will remain a key objective of the European Union, which can also contribute to strengthening the cohesion between the Euro economies. Similarly, according to Marelli (2007) the adoption of the Euro is an important initiative that may contribute to a gradual opening of national and regional economies, the synchronization of business cycles and the deeper integration of markets of goods, services and factors of production.

Christodoulakis (2009) illustrated that the divergences in terms of real determinants, especially GDP per inhabitant, increased significantly after the creation of the Eurozone. Despite the process of convergence between the Members the European Economic Community in the 1980s and early 1990s, the introduction of the Euro was accompanied by increasing divergences. According to Christodoulakis, real convergence was perceived as a continuation of the nominal convergence achieved by the Member States before the adoption of the common currency, that has not been accomplished so far. According to Christodoulakis, the strongest divergences in the Euro Area are determined by the high deficits of the current accounts and trade balances. From another perspective, Tokarski (2019) studied nominal and real convergence in three founding Member States - Germany, France, Italy. According to the analyst, one of the main challenge for the proper functioning of Economic and Monetary Union is determined by the different economic models and the degree of interventionism of governmental actors in the economy, which have been adjusted to meet the realities of Economic and Monetary Union.

Monfort et al. (2013) studied income convergence, identifying significant divergences between Member States. By applying quantitative methods, analysts have identified that the New Member States from Central and Eastern Europe together with Greece form a convergence club. In contrast, Monfort et al. did not identify a clear division between Euro and Non-Euro countries. Following the discrepancies confirmed by the applied model, experts emphasized the need to implement structural reforms in order to catalyse real convergence, especially within the Eurozone. According to the study conducted by Monfort et al., Eurozone is a dual economy, which comprises countries that

have different growth rates and industrial structures. From the analysts' perspective, the accession of the Central and Eastern European countries to the Eurozone might negatively affect the stability of the Economic and Monetary Union.

In contrast with the other experts that focused on income convergence, Estrada et al. (2013) studied the labour market variables within the Eurozone, highlighting that the adoption of the single currency was not a source of discrepancies between countries in terms of unemployment rates. According to analysts, the lack of convergence between countries in the field of unemployment was most likely caused by a combination of factors, among which the most relevant were: the economic and financial crisis, the autonomy loss of the central banks in the countries that have adopted the Euro and the lack of a mechanism to compensate the asymmetric regional shocks.

3. Data & methodology

Studies aiming the topic of real convergence initially derived from the economic growth literature. Over the last past decades, researchers interested in studying convergence using quantitative methods have been popularized two indicators: β-convergence and σ-convergence. The purpose of β-convergence is to identify if the initially poorer countries or regions experience higher growth rates comparing to the richer countries or regions. This concept derives from the neoclassical growth model (1956) and it is based on the hypothesis of diminishing returns to capital. According to this assumption, economies with lower volume of capital, with a higher profitability in this factor, record higher growth rates than the capital intensive economies. β-convergence is used both in the absolute and conditional frameworks. The former assumes that countries and regions have similar initial conditions and economic structures and will reach on the long run the same state of equilibrium. By contrast, the conditional convergence presumes that economies have different conditions and economic determinants and will tend to different states of equilibrium. Taking into consideration that this study focuses on the Eurozone, which is assumed to be a group of countries with similar economic structures, we will take into consideration the absolute convergence hypothesis. β-convergence is accompanied by σ-convergence, which studies if income gaps between countries or regions diminish over time. According to Gligor & Ausloos (2008), β-convergence is a necessary but not sufficient condition for reducing disparities between economies (σ-convergence). According to Gligor and Ausloos (2008), although low-income countries grow faster than high-income countries, this might not be sufficient to promote income equalization between economies.

In order to examine the impact of the economic and financial crisis on the evolution of income convergence, we have divided the interval 2000-2019 in two sub-periods: 2000-2008 and 2009-2019. Our database comprises the evolution of GDP per capita calculated as real expenditure per capita in PPS, as provided by Eurostat, for the Eurozone Members between 2000 and 2019.

The absolute β-convergence has been computed based on a simple linear regression, where the depended variable is the GDP per capita growth rate in two sub-periods (2000-2008 and 2009-2019) and the independent variable is the logarithm of the initial income (in our case, 2000 and 2009):

$$\frac{1}{T}\left[\frac{y_{it}}{y_{it-1}}\right] = a + \beta_1 ln(y_{io}) + \varepsilon \quad (1)$$

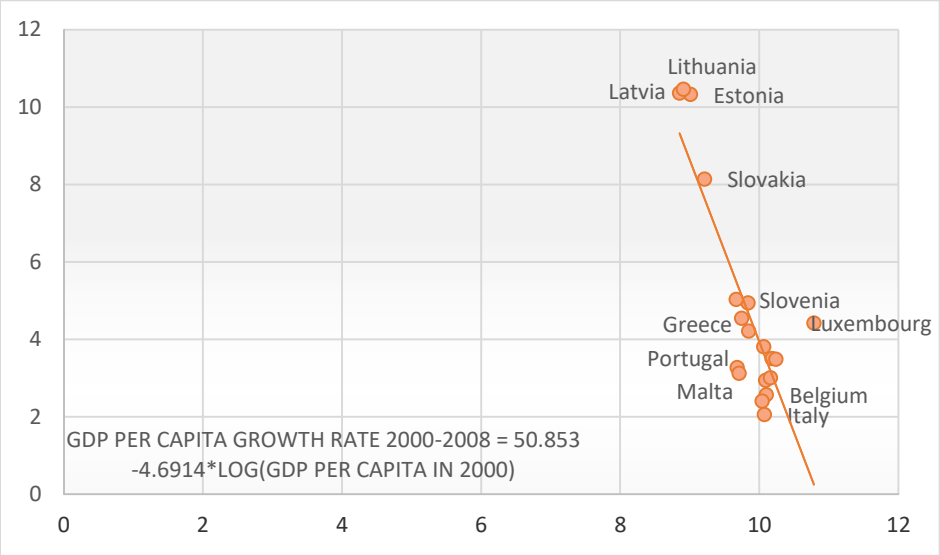
In addition to β-convergence, σ-convergence was computed based on the standard deviation of the logarithms, as follows:

$$\sigma log_t = \sqrt{(\frac{1}{n}) \sum_{i=1}^{N} [\log(y_{it}) - \log(\mu_t)]^2} \quad (2)$$

4. Results

Figure 1 illustrates the results of β-convergence, computed based on equation 1 for the Members of the Eurozone between 2000 and 2008, a period that preceded the economic and financial crisis. According to our calculations, the three Baltic states, that joined the Euro Area starting with 2011 experienced the highest catching-up speed in this group of states, exceeding on average 10%: Lithuania (10.5%), Latvia (10.4%) and Estonia (10.3%). Moreover, other two member States – Slovakia and Slovenia – experienced growth rates above Community's average, reaching between 2000-2018 8.1% and 5%. From the group of the Old Members, the highest growth rates before crisis were recorded by Greece (4.5%) and Luxembourg (4.4%). In contrast, the lowest GDP growth rates were experienced in this sub-period by France (2.4%) and Italy (2%).

Figure 1. β-convergence in the Eurozone between 2000-2008



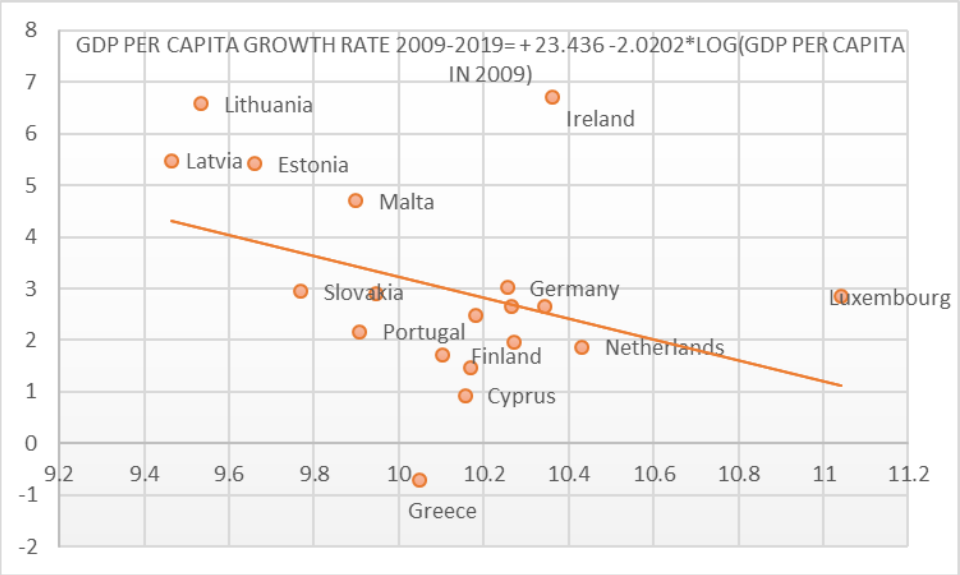
Source: Author's computations

In order to study the impact of the economic and financial crisis on income convergence in the Eurozone, we have also analysed the evolution of β-convergence during the sub-period 2009-2019. In this respect, Figure 2 illustrates that in the last decade, the growth rates of the Eurozone Members were lower than in the sub-period 2000-2008, and even negative. Consequently, the economic and financial crisis, that was followed by the sovereign debt crisis, hampered the catching-up process that took place at the beginning of the 21st century. The only country that experienced better economic performances in the second sub-period was Ireland, with average growth rates reaching

7.7%. Ireland was followed by the three Baltic States, that although have continued the process of catching-up, have recorded lower growth rates comparing to the sub-period 2000-2008: Lithuania - 6.6%, Latvia - 5.5% and Estonia - 5.4%. The catching-up process in Slovenia and Slovakia has been negatively affected by the crisis, as the growth rates were significantly below those experienced between 2000-2009 (8.1% vs. 2.9% in Slovakia and 5% vs. 2.9% in Slovenia). The most significant affected economy in the Eurozone was Greece, which experienced a negative economic growth, reaching on average -0.7%.

In contrast with the results obtained for the sub-period 2000-2008, where it was a strong relationship between the initial income and the subsequent growth rates (R-squared – 0.71), in the sub-period 2009-2019, the relationship is weak (R-squared – 0.14). Consequently, we have found evidences in favour of (absolute) β-convergence only for the sub-period 2000-2008.

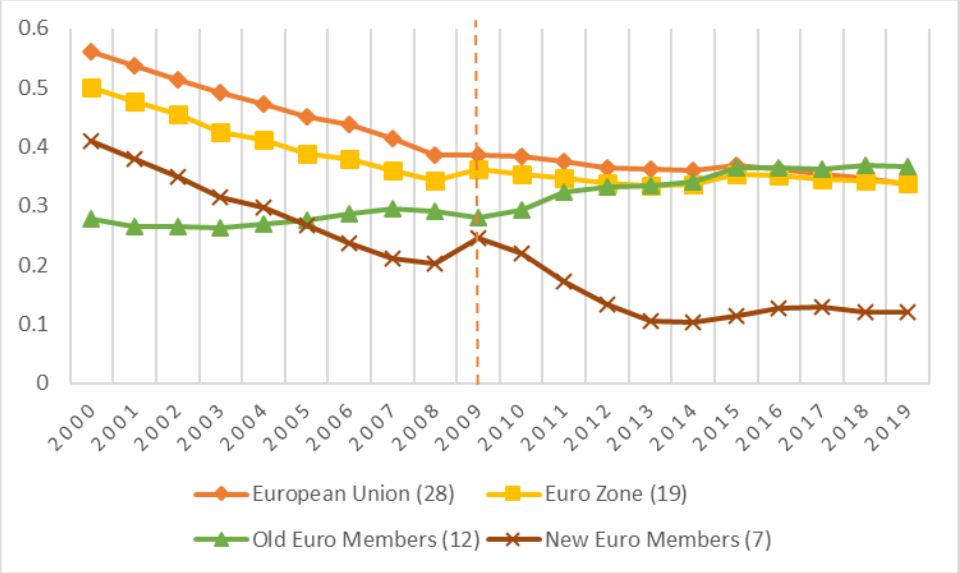
Figure 2. β-convergence in the Eurozone between 2009-2019



Source: Author's computations

With the purpose to examine if the income gaps in the Euro Area decreased between 2000-2018, we have calculated the evolution of σ-convergence based on equation 3. In this respect, the values of the standard deviation suggest that during 2000-2019, the income gaps between the Members of the Eurozone decreased with 32%, while in the European Union with 40%. However, the analysis of the evolutions which occurred in the New and Old Euro Member States leads to contradictory results: while in the Old Members States, the divergences increased with 32% during the entire period, the New Members have become increasingly homogenous. The analysis of the σ-convergence in the sub-period 2000-2008 illustrates that the income gaps also within the European Union and the Eurozone decreased with 31%. In contrast, in the sub-period 2009-2018, the σ-convergence decreased with only 12% in the European Union and 6% in the Eurozone, increasing with 30% in the Old Euro Members.

Figure 2. σ-convergence in the Eurozone between 2000-2019



Source: Author's computations

5. Conclusions

Real convergence has been and will remain in the upcoming years a complex, but increasingly debated topic. The aim of this paper was to study income convergence in the Euro Area, also taking into consideration the impact of the economic and financial crisis. In this respect, we have calculated the (absolute) β-convergence for two sub-periods (2000-2008 and 2009-2019) illustrating that the economic and financial crisis have significantly hampered the process of catching-up in the Eurozone. Although, in the poorer New Euro Members the process of income convergence has continued after the crisis, the growth rates were lower comparing with the values from 2000-2008. In contrast, the Old Euro Member States were more affected than the New Members, Greece recording even negative economic growth between 2009-2019. In spite of the strong relationship between the initial income and the subsequent growth rates identified between 2000-2008, the results of the absolute convergence regression were not significant for the period 2009-2019. Consequently, the findings should be interpreted with cautions. As far as σ-convergence is concerned, we have illustrated that although the divergences decreased between 2000-2019, the crisis had negatively influenced the income distribution. The most affected were the Old Euro Members, where the income gaps raised mainly after 2009. In spite of the negative influence of the economic and financial and sovereign debt crises, the progress of the New Members continues to be encouraging. Consequently, the Eurozone leaders should take effective measures in order to enhance the economic growth to the levels before the crisis and to promote cohesion between its Members.

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MULTIPLYING AND DIVIDING IN THE FISCAL PROCESS. AN ALGEBRAIC APPROACH

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Abstract: *The paper aims to examine two paired phenomena in the fiscal process (more exactly, in the budgetary obligations collecting), namely multiplying and dividing. The multiplier of the fiscal collecting indicates how and how much the fiscal evasion could increase the budget receipts (if the fiscal administration does work), while the fiscal divisor indicates how and how much the fiscal evasion could decrease the budget receipts (if the fiscal administration doesn't work). The two indicators are algebraically modelled, and some empirical data are used in order to illustrate the mechanisms of multiplying and dividing, respectively, regarding the budgetary receipts when the voluntarily conformation to pay the budgetary obligations leaves to be still desired.*

Keywords*: fiscal evasion, fiscal multiplier, fiscal divisor, budgetary receipts.*
JEL Classification*: B22, B41, C02.*

1. Non-technical introduction

The economic process is one of social inter-actions of goals, means, and actions. Consequently, this process is characterized by causal, structural, and functional relationships. Moreover, many interactions are „endowed" with feedbacks (either negative or positive), feedforwards (anticipations), multiplying and dividing of the economic variables involved (Dinga, 2009). The paper aims to examine the phenomena of multiplying and of dividing assigned to the fiscal-budgetary process, more exactly linked to the fiscal evasion phenomenon. By fiscal evasion is understood that behaviour of an economic actor (consumer, producer, trader, investor, financer etc.) which brings monetary prejudices to the state – more exactly, to the public budget. Since the analysis developed within the paper is focused on the fiscal evasion, it is useful to additionally clarify this concept. To this end, we provide the following considerations in the matter:

- one of the market failure is the incapacity of the free decentralised market to provide public goods (the public goods are those goods which are, inter alia, free to consumption and non-rivalry, that is they are at free disposal of the individuals and their consumption is, principled, unlimited); such incapacity is not a defect of the free market, by the contrary, it is a logical consequence of the free market criterion of behaviour – profit maximizing;
- so, the public goods (called also as public positive externalities – PPE) must be produced and distributed by the state;
- to finance the public goods supply (Dinga, 2018), the state collects, based on the law, mandatory contributions from individuals in the society (either as physical persons or juridical ones) called taxes;
- in the process of such a collecting, occurs the phenomenon of the fiscal evasion, which has as result the diminishing of tax amount collected by the fiscal administration of the state compared with the tax amount due by law (we do not discuss in the present paper more about the fiscal evasion, because it is not the main subject of the study).

In the fiscal evasion process could occurs phenomena of multiplying (for example of the fiscal evasion itself or, by the contrary, of the due tax amount to the public budget) or, after the case, of dividing. In fact, just these phenomena will be further put under our analysis.

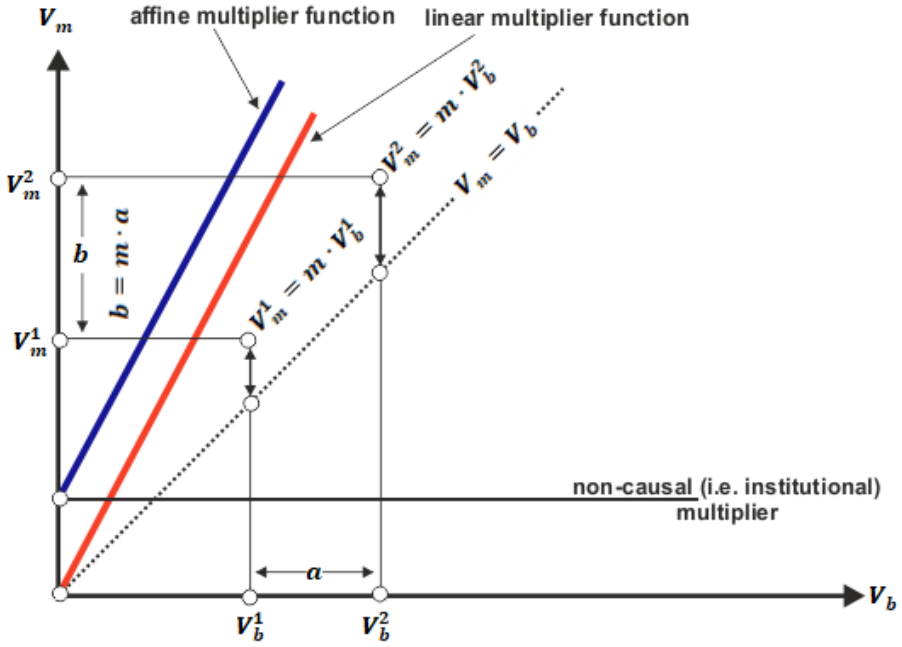
2. The concept of multiplier in the economic process

Generally, a multiplier (Cloyne, , et al., 2020) is a coefficient with which a base variable must be multiplied in order to obtain a result conditioned by that base variable. To logically understand the abstract concept of multiplier, some brief clarifications are of usefulness:

- *firstly*, a multiplier must be supra-unitary (being noted a given multiplier with m, then the inequality $m > 1$ must be held);
- *secondly*, between the base variable (V_b), and the result of applying the multiplier (V_m) must subsist a causal relationship, that is, $V_m = f(V_b)$; in fact, the multiplier uses the common multiplication algebraic operation to pass from V_b to V_m, that, is simply $V_m = m \cdot V_b$;
- *thirdly*, the algebraic relationship between base variable and the multiplied variable is reversible, that is, if the tow values are known, the multiplier results algebraically: $m = \frac{V_m}{V_b}$ (the condition of existence, that is, $V_b \neq 0$, is obviously verified);
- *fourthly*, the function of the multiplied variable can be either linear ($V_m = m \cdot V_b$) or affine ($V_m = n + m \cdot V_b$, where $n \in \mathbb{R}$, and $n \neq 0$); in the most cases, in economic analyses are used the linear functions of multiplier but, of course, could arise cases in which a constant is held although the multiplier is null;
- *sixthly*, the way of multiplier action is based on mechanisms of impulse transmission (see, for example, the well-known multiplier of the autonomous, i.e., public, investment: $m_{ai} = \frac{1}{s}$, where with s has been noted the marginal propensity to saving;
- *seventhly*, the multiplier coefficient can transform into a divisor one, when the economic process suffers a radical change in its propensity; to be mentioned such a reversibility is indefinite possible (if there is just a cyclicality in the reversibility in case should, of course, examined separately from the present research);
- *eighthly*, the multiplier question (Dinga,, 2018) can be studied from the point of view of its stabilization (or not); for example, in such a case could be studied a so called echo function, which describe the trajectory of an impulse introduced in the economic process – such an impulse, either fiscal or monetary or of any other kind, will lose its potential to multiply the base variable concerned after a while, and this amortization can be algebraically described and analysed.

Figure 1 gives a synoptic image of the concept of economic multiplier (in fact, of any multiplier) (Favero & Karamysheva, 2017).

Figure 1. The abstract mechanism of a multiplier



Source: author

3. The concept of divisor in the economic process

The concept of divisor is the mirrored image of the multiplier. Algebraically, there is no difference between multiplier and divisor, except the numerical value of the coefficient through which the result variable is obtained from the base one. So, if is noted with d the divisor coefficient, the we can write: $V_d = d \cdot V_b$, under the condition $d < 1$. To be mentioned all the considerations done for the multiplier are valid also for the divisor, mutated mutandis (for example, in Figure 1, all the results given by the dividing process will be situated under the prime bisecting. In the economic field there are many cases in which the divisor works, so we'll consider some cases:

- any tax rate divides the base variable (tax base), so giving a net value of it;
- inflation divides the purchasing power of any nominal income;
- the rate of minimal mandatory reserves, enacted by the central bank and assigned to commercial bank deposits, divides those deposits.

4. Multiplying and dividing in the fiscal field

4.1. The concept of public money

This concept is not outside confusions and misunderstanding, so we'll provide some considerations synthesized from the online specialized literature (Dinga,, 2018).

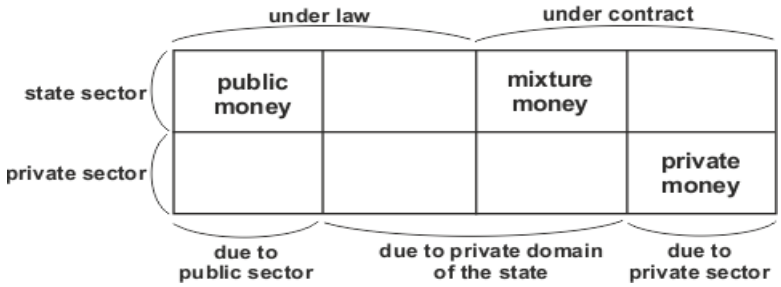
- money must be classified by its nature;
- the nature of money is identifiable based on the criterion: property right;
- the property right must be viewed from the perspective of the final due destination of money in case;
- there are, based on the above, three kinds of money:
  - public money: that money, no matter who is its owner, which is due, by law, to the state as government, without a correspondingly counterpart (for example: the tax included in the gross wage is public money, as well as the

VAT included in the price charged by the seller, although that money is owned by the worker or by the seller);

- private money: that money which is due, by contract, to someone, except the state, no matter the particular reason of such an obligation to transfer money;
- mixture money: that money due to the state, based on contract, not on the law.

In the present paper the public money is of interest only (see Figure 2).

Figure 2. The typology of money



(with the permission of publication *The Market for Ideas*).

4.2. The concept of fiscal field

By fiscal field is understood that field of economic activity in which are collected and spent the public money. Not all public institutions and authorities are included into the fiscal field – for example, National Bank of Romania, although is completely publicly capitalized, has private money; the same, Financial Supervisory Authority works under the aegis of private money). Typically, the fiscal field is associated with the Government, more specifically, with Ministry of Public Finance, and much more specifically, with the functioning of the consolidated general budget (CGB). So, the fiscal field can be defined as the *set of activities and transactions linked to collecting and spending the public money, under the law*.

4.3. The concept of fiscal evasion

Generally, the fiscal evasion is a behaviour of someone who, with or without intention, do not pay, voluntarily, fully and on time, his/her/its obligations to the state (another term here is the budgetary obligations). In present terminology, it is about of avoiding (or about of evading from) to pay the public money – for example, the tax on personal income, the VAT, the customs taxes and so on. Beyond the civil component (the amount due to the state) the fiscal evasion behaviour constitutes also a criminal offence and is criminally punished.

5. Algebraic modelling of the fiscal evasion multiplier

In the fiscal evasion phenomenon occurs processes of multiplying. Let's put some notations:

- FE: the monetary amount of fiscal evasion, as it is discovered by the control of fiscal administration;
- PP: the monetary amount of pecuniary penalty (civil punishment);

- k: the coefficient of penalization for the lag time of delaying to pay the budgetary obligations;
- d: the duration of delaying to pay the budgetary obligations (according to the measurement units used to define the coefficient d);
- DP: the monetary amount of delaying penalization.

So, the multiplier of fiscal evasion could be formalized as:

$$m_{FE} = \frac{FE+PP+DP}{FE} = 1 + \frac{PP+DP}{FE} = 1 + \frac{PP+k \cdot d \cdot FE}{FE} = 1 + \frac{PP}{FE} + k \cdot d = 1 + \varphi \quad (1)$$

where with φ is noted the expression $\frac{PP}{FE} + k \cdot d$, which could be called as the *value added of the discovered fiscal evasion* (indeed, much of fiscal evasion remains undiscovered either due to the incompetency of the fiscal administration or due to the corruption of fiscal administrations civil servants. As PP and k are done by law (that is, they are constant), we can note PP with α, so the fiscal evasion multiplier becomes:

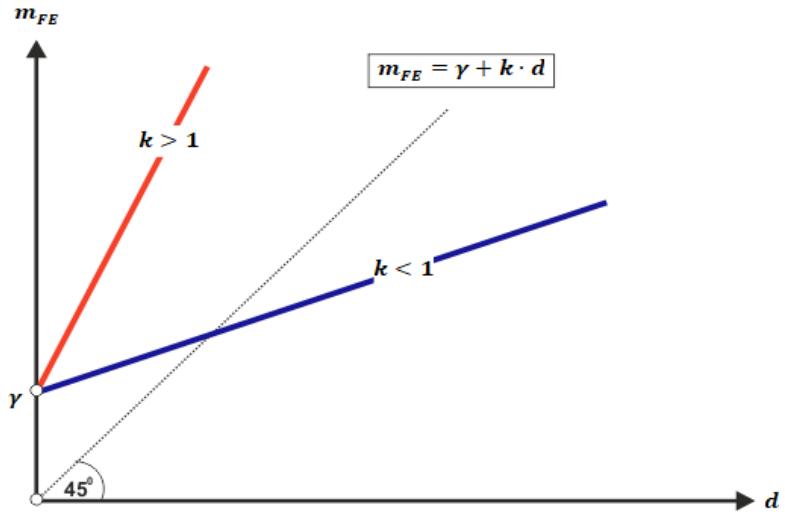
$$m_{FE} = 1 + \frac{\alpha}{x} + k \cdot d \quad (2)$$

where $FE = \boldsymbol{x}$, because it is the main economic variable in the formula (although d is also a variable, it not of economic kind, but of calendar kind. In fact, the algebraic formula of the fiscal evasion multiplier is three-variate polynomial (it is depending on two independent variables). A didactical case of the three-dimensional graph of the fiscal evasion multiplier can be viewed in Figure 4.

From a qualitative point of view, if would be considered the fiscal evasion multiplier as depending on a single independent variable, we have the following analytical conclusions:

(a) for x given: $m_{FE} = \gamma + k \cdot d$, where $\gamma = 1 + \frac{\alpha}{x} = constant$ (Figure 3)

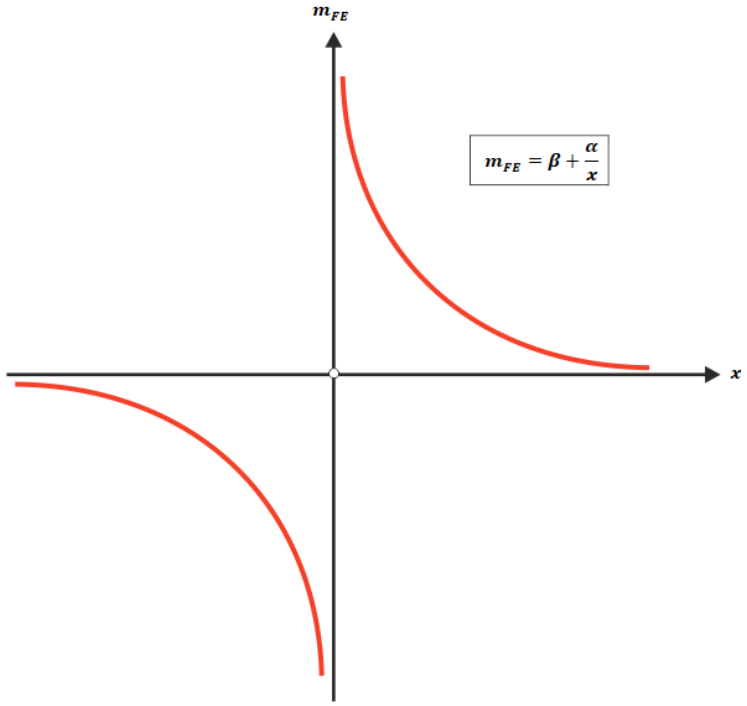
Figure 3. The fiscal evasion multiplier for the affine case



Source: author.

(b) for d given: $m_{FE} = \beta + \frac{\alpha}{x}$, where $\beta = 1 + k \cdot d = constant$ (Figure 4)

Figure 4. The fiscal evasion multiplier for the hyperbolic case



Source: author.

6. Modelling of the fiscal evasion divisor

To deal with the fiscal evasion divisor it must firstly to describe the economic process by which the phenomenon of dividing occurs. Further such a description is provided.

- when fiscal evasion happens, a some amount of public money (that is, of private money due, under the law, to the state) is not received by the state (the public budget);
- the decrease of the fiscal revenues leads to an increase of the fiscal (or budgetary) deficit, since the expenditures committed by the government must be done no matter what happens with the fiscal programmed revenues;
- as consequence, such increasing of the budgetary deficit must be financed by increasing the public debt;
- increasing of the public debt means an increase with the interest which must be payed to the new holders of the bonds;
- such payments with the interests assigned to the increased public debt constitutes the economic content of the concept of fiscal evasion divisor.

Let's make some notations:

- BD_{FE}: the budget deficit increasing due to the fiscal evasion FE (obviously, $BD_{FE} = FE$);
- PD_{FE}: the public debt caused by fiscal evasion FE (obviously, $PD_{FE} = BD_{FE}$);

- r_{PD}: the rate of interest (yield rate) paid by the government for the public debt (assigned to the bonds issued);
- t: the maturity horizon of the bonds issued in financing the public debt caused by fiscal evasion (typically t could be 10; so, these bonds accounts for the Maastricht criterion of real economic convergence with EU, namely the nominal interest rate on long term);
- ω: *the value lost by the undiscovered fiscal evasion.*

So, it can be written:

$$\omega = FE + r_{PD} \cdot t \cdot FE = FE \cdot (1 + r_{PD} \cdot t) \quad (3)$$

$$d = \frac{FE}{FE \cdot (1 + r_{PD} \cdot t)} = \frac{1}{1 + r_{PD} \cdot t} \quad (4)$$

Since $r_{PD} > 0$, and $t > 0$, it results that $r_{PD} \cdot t > 0$, so $1 + r_{PD} \cdot t > 1$, so $d < 1$, so d is a divisor of fiscal evasion.

Some qualitative conclusions can be drawn here:

- like m, d is a three variate function, that is, we have two independent variables: r_{PD} and t;
- unlike m, d function is symmetric between r_{PD} and t; so, no matter which of the two variables is presupposed constant, the d function depending on the another has the same graphical image.

7. On the total multiplier-divisor effect of the fiscal evasion

It is of theoretical and fiscal policy (Flynn, et al., 2020) interest to put together the fiscal evasion multiplier and the fiscal evasion divisor in order to find a total monetary influence of the two processes linked to the fiscal evasion. In is noted with ω the total influences of the two mentioned processes, then, from the algebraical formalizations it can be written:

$$\omega = 1 + \frac{PP}{FE} + k \cdot d + \frac{1}{1 + r_{PD} \cdot t} \quad (5)$$

8. Conclusions

The paper has examined the phenomena of multiplying and of dividing assigned to the fiscal-budgetary process, more exactly linked to the fiscal evasion phenomenon. From the logical standpoint was defined the concept of economic multiplier like been a coefficient with which a base variable must be multiplied in order to obtain a result conditioned by that base variable and were been brought some clarifications on this matter.

For the concept of divisor, which is the mirrored image of the multiplier, arguments of an algebraic nature were brought in support of the statement that there is no difference between multiplier and divisor, except for the numerical value of the coefficient by which the resulting variable is obtained from the first. Continuing the paper, the concepts of fiscal

field and tax evasion were defined and the algebraic modeling of the tax evasion multiplier was carried out.

The author's scientific concerns in this field will be concretized with another paper, in which we will examine qualitatively and quantitatively (including empirical data) the total influences on the public budget of the phenomena of multiplication and division in the tax evasion process.

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ANALYSIS OF THE INFORMATION ON THE SOCIAL ASPECTS SUBMITTED IN THE SUSTAINABILITY REPORT BY THE COMPANIES IN ROMANIA WHICH USE THE SUSTAINABILITY REPORTING STANDARDS DEVELOPED BY GRI

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Abstract: *Starting with the financial year for 2017, public interest entities in Romania that register more than 500 employees are obliged to publish non-financial information in the administrator's report or in a separate report. This information refers to environmental, social, human rights, anti-corruption and bribery issues, as well as other aspects considered significant. The objective of this article is to analyze the information reported by the Romanian companies that use the reporting standards issued by the Global Reporting Initiative, regarding the social aspects.*

Key words: *500 employees, non-financial information, environmental, social issues.*
JEL Classification: *M14.*

1. Introduction

The cornerstone of the non-financial declaration, regulated by Directive 2014/95 / EU of the European Parliament and of the Council of 22 October 2014, can be considered the Communication adopted by the European Commission in 2011 "The Single Market Act - Twelve levers for stimulating growth and Confidence building - "Together for a new growth". In this Communication, the need to increase the transparency and comparability of the information disclosed by the companies in the reports on sustainability, regarding the social and environmental elements was found at European level.

Subsequently, the Commission adopted "A new EU strategy (2011-2014) for corporate social responsibility", in which it underlined the need to improve the presentation by companies of information on social and environmental elements.

Two years later, the European Parliament through its resolutions on "Corporate social responsibility: responsible and transparent business behavior and sustainable economic growth" and "Corporate social responsibility: promoting the interests of society and a path to economic recovery. sustainable and comprehensive ", confirmed the importance of presenting companies with information on sustainability, such as environmental and social factors, in order to identify the risks regarding sustainability and to increase the confidence of consumers and investors.

In this context, the European Parliament invited the Commission to prepare a legislative proposal on the reporting of non-financial issues by companies. The European Parliament also underlined the need for a high level of flexibility in presenting information, given the multidimensional nature of corporate social responsibility and the diversity of corporate social responsibility policies. At the same time, reporting non-financial information should allow comparisons and provide stakeholders, investors and consumers with easy access to information on the impact of companies on society.

Thus, on October 22, 2014, the directive of the European Parliament and of the Council amending Directive 2013/34 / EU regarding the presentation of non-financial information and information on diversity by certain large companies and groups was adopted.

The aforementioned directive was transposed into national law by the Ministry of Public Finance through the Order of the Minister of Public Finance no. 1.938 of August 17, 2016 published in the Official Gazette Part I, 680/2.IX.2016.

The key moments in the emergence of the concept "non-financial statement" are graphically represented in Figure no. 1 Non-financial statement - key moments

Figure no. 1 Non-financial statement - key moments

April 13, 2011	EC Communication entitled "The Single Market Act - Twelve levers for stimulating growth and strengthening confidence -"Together for a new growth"
October 25, 2011	Commission communication entitled "A new EU strategy (2011-2014) for corporate social responsibility"
February 6, 2013	European Parliament resolutions "Corporate social responsibility: responsible and transparent business behavior and sustainable economic growth" and "Corporate social responsibility: promoting the interests of society and a path to a sustainable and comprehensive economic recovery"
October 22, 2014	Adoption of the European directive on the presentation of non-financial information and information on diversity by certain companies and large groups.

2. Content of the non-financial statement

The companies that fall under the provisions of the Order of the Minister of Public Finance no. 1.938 / 2016 are obliged to prepare and publish the Non-financial Statement. It should contain, where they are necessary for understanding the performance, position, development of society and the impact of its activity, at least information on social and personnel, environmental, respect for human rights and fight against bribery and corruption. .

It is also necessary that the non-financial information disclosed in the prepared report should also include the following:

- a brief presentation of the business model of the company;
- a presentation of the policies approved by the company in relation to the social and personnel aspects, the environment, the fight against corruption and the giving, the respect of human rights, including the due diligence procedures applied;
- the results of the mentioned policies;
- the main risks related to social issues, the environment, the fight against corruption and bribery, respect for human rights arising from the entity's operations, including, when proportionate and relevant, how the company manages the aforementioned risks, its services or products that it could also have a negative impact on its business relationships;
- key non-financial performance indicators considered relevant for the activity of the entity.

In the event that an entity has not adopted a policy regarding one or more of the elements presented, then it must present this aspect in the non-financial statement and justify its decision.

Also, disclosure of information on matters under negotiation or impending developments may be omitted in exceptional cases where disclosure of such information would significantly damage the company's business position, provided that such omissions do not lead to misunderstanding of the development. , the performance and position of the company and the impact of its activity. This omission must be submitted to the opinion of the members of the management, administrative and supervisory bodies, who bear collective responsibility for the opinion given.

In order to disclose non-financial information, entities may be guided by international, national or European Union frameworks, specifying this aspect in the prepared report.

In the table no. 1 summarizes the main aspects to be reported in the non-financial statement.

Table no. 1 Aspects to be reported in the non-financial statement

Issues	Social and personal
	Environment
	Respecting the human rights
	Combating corruption and bribery
	The business model
	Policies adopted in relation to social and personnel, environmental, human rights, anti-corruption and bribery issues
	Results of policymakers adopted in relation to social and personnel issues, environment, respect for human rights, fighting corruption and bribery
	Main risks related to social and personnel aspects, environment, respect for human rights, combating corruption and bribery arising from the operations of the entity
	Significant non-financial performance key indicators for the specific activity of the entity

3. Information disclosed in the non-financial statement on social and personnel issues

Companies that fall within the area of applicability of the Non-Financial Directive must present in the non-financial declaration the following significant information regarding social and personnel aspects.

Of these, the following information is considered relevant:

- fulfilling the fundamental conventions of the ILO;
- the relationship with the trade union organizations, including regarding the respect of the trade union rights;
- issues related to employment, including employee participation and / or consultation;
- presentation of working and employment conditions;
- diversity issues, such as equal treatment in employment (including those related to religion, age, disability, sexual orientation, gender, ethnicity and other significant issues) and gender diversity;

- human resources management, including career and restructuring management, professional insertion, remuneration system, vocational training;
- the relationship with customers, products and services with possible effects on the safety and health of consumers, accessibility of products and services, degree of consumer satisfaction;
- consequences for vulnerable consumers;
- safety and health at work;
- responsibility for marketing and research; and
- the relationship with the local communities, including the contribution to their economic and social development.

Information on religious or philosophical belief, ethnic or racial origin, sexual orientation and membership of unions are considered as special personal data relating to a natural person, according to Article 9 of Regulation (EU) 2016/679, and which must be processed under the conditions mentioned to that article. As a result, companies should only publish aggregated or anonymized data (so that the respective persons are not identifiable) regarding the aforementioned issues.

In communicating information on social and personnel issues, entities may find it useful to guide internationally recognized frameworks, such as the IOM Tripartite Declaration on Principles on Multinational Companies and Social Policy, OECD Guidelines for Multinational Companies, ISO 26000.

For example, entities may publish the following key non-financial performance indicators related to social and personnel issues:

- the number of workers who carry out activities with a high risk of specific diseases or accidents;
- number of accidents at work, types of occupational diseases or injuries;
- gender diversity and other elements related to diversity;
- workers who benefit and are entitled to parental leave, according to gender;
- processes for consulting employees;
- number of workers employed by temporary contracts, by gender;
- average hours of vocational training per year for each worker, according to gender;
- staff turnover rate;
- persons with disabilities employed.

4. Analysis of information on the social aspects presented in the non-financial statement by Romanian companies using GRI Standards

In order to disclose non-financial information, Romanian entities may use different reporting frameworks. Of these, the most internationally recognized are:

- The Global Compact of Enterprises (UN);
- Guiding principles on business and human rights for the implementation of the UN protection, respect and remediation framework;
- Guidelines on OECD multinational enterprises;
- ISO 26000 standard of the OIS;
- Tripartite declaration establishing the principles regarding multinational enterprises and ILO social policy;
- The Global Reporting Initiative (GRI).

At the level of 2019, the Romanian companies that used for reporting non-financial information the standards developed by the organization of the Global Reporting Initiative are the following:

1. CEZ Romania

2. Distribution Energie Oltenia SA
3. Electrica
4. Kaufland Romania
5. Patria Bank
6. Petrom
7. Romanian Power Grid Company-Transelectrica SA

Also, according to the requirements, the entities notified the GRI regarding the use of the standards issued by this organization for reporting non-financial information. Notification was made either by submitting the sustainability reports or by the report registration system, available on the Global Reporting Initiative website.

Another requirement of this organization is the verification of sustainability reports. This verification may be carried out by the reporting entity or by a third party authorized by the reporting entity.

In the table no. 3 are presented the key indicators of non-financial performance regarding the personnel aspects used by the 7 companies selected for the analysis of the social information reported in 2019.

All entities reported information on the health and safety of employees, except Patria Bank. This omission may be due to the fact that the entity did not consider this information to be relevant in relation to its specific activity.

Regarding the information regarding the professional training of the employees, all the entities reported data on the training programs in which they participated.

Disclosures regarding the benefits and the policy of renumbering the employees were presented by most of the entities under analysis.

Regarding the number of employees, types of employment contracts, staff turnover, gender diversity, it can be observed that sufficient data were reported in this case as well.

Regarding the number of resignations, persons with disabilities employed and the number of dismissed persons, it is observed that only one entity presented the number of persons with disabilities employed, and regarding the number of resignations and dismissals, two entities reported data.

5. Conclusions

The introduction of the obligation for large companies to present a series of non-financial information in their reporting cycle gave a clear signal of increasing transparency and accountability in business on social and environmental level.

The practice of reporting non-financial information can help companies move from complying with legal regulations, improving business conduct and increasing their contribution to building a more sustainable future.

Sharing verifiable, qualitative and clear information creates and enhances trust in the organization of key stakeholders, including investors, clients and civil society. This information not only provides stakeholders with an understanding of how business is conducted, but also how major environmental and social risks are taken into account by companies or even turned into opportunities. Presenting this information to stakeholders and integrating their feedback into business disclosures and activities leads to greater stakeholder involvement and helps entities better manage stakeholder expectations.

The level of delineation of information on social and personnel issues disclosed by the 7 entities analyzed is sufficient, but it can be improved by consulting stakeholders on the information they need to know.

Thus, collaborating with stakeholders, reviewing evaluations, managing risks and performance are the necessary ingredients for companies to generate a more positive impact and to improve their company value.

Table no. 3 Key non-financial performance indicators reported by companies using GRI standards

The society	Information on fixed-term contracts	Information on contracts for an indefinite period	Information on part-time contracts	Information on the existence of collective labor contracts	Information on the number of new employees and staff turnover	Information on the number of employees with disabilities	Information on the number of resignations and dismissed persons	Information about employees on leave for child-rearing	Information on employees eligible for retirement	Employee health and safety information	Information on vocational training and training	Information on employee benefits and remuneration policy
CEZ Romania	x	x	x	x	x		x	x	x	x	x	
Distribution Energie Oltenia SA					x			x	x	x	x	x
Electrica				x	x					x	x	
Kaufland România	x	x	x	x	x	x		x		x	x	x
Patria Bank	x	x	x		x		x				x	x
Petrom				x				x		x	x	x
Romanian Power Grid Company-Transelectrica SA				x						x	x	

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BASIC CONCEPTS IN STRATEGIC FINANCIAL MANAGEMENT

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***Abstract**: The modern conception of economy bases the conceptualism of finances on judgment, logic and practicability, which leads to the increasing of the benefit and to the importance of the organization. Finances are represented by the financial resources of the organization that performs its functions. In order to provide the products and services useful to the society, both the public and the private domain are needed. The private domain has a competitive economy with products and services made from private capital. The public domain has a forecasted, concentrated economy, the products and services being made from public funds. Public finances are made up of resources, expenses, loans and public debts associated with the state, the public and administrative-territorial authorities, and are materialized in the public budget. Private finances are made up of resources, expenses, loans, receivables and payment obligations of private organizations. Banks and other financial institutions that attract capital form the financial market. Financial management provides the institution with the resources it needs. Financial management can be defined as the science that studies the processes of leading, predicting, organizing, training and controlling the financial capital available in the organization in order to achieve the proposed objectives. The organization is a system, a set of sides that interact, perform processes or solve tasks in order to achieve the proposed objectives. This is made of inputs, processes, outputs and control or feedback.*

***Key-words:** finances, capital, financial management, organization, public, private.*
***JEL classification:** G00, G2.*

1. The notion of finance and the finances functions

1.1. The concept of finance

Historically, finances have emerged together with the trade between products and money. Finances, during slavery, were considered a collection of money in order to ensure public spending, while in the feudal period, this phenomenon of trade between products and money increased, leading to the raising of capital in order to finance the army. The importance of the state increases during the period of capitalism having a role in maintaining the internal discipline, in protecting the regions and the national autonomy but also in development, increasing the need to raise public funds. If we refer to socialism, it can be specified that a fraction of the national income is used to exercise the state activities.

Generally speaking, finances are known as social principles of economic type, dependent on the fulfillment of state roles. The notion of "finance" from the Latin "finatio, finacias" means "to pay in money", but over time it has taken on different meanings, at present it includes operations, resources and monetary relations.

There is a close connection between finance and economic and administrative sciences, but also with politics. From the perspective of economic sciences, the target of finance is the economic links from the act of organizing and distributing monetary capital, in relation to the state budget and public institutions, but to the budgets of economic agents and non-profit organizations. Finances are decreed legally, legislatively or normatively, being imposed on society. Also, the legal framework for actions of a financial nature is given by political parties.

The modern conception of economy bases the conceptualism of finance on judgment, logic and practicability, which leads to the increase of the usefulness consumption, increase of the benefit and importance of the organization. So, finances are represented by the financial resources of the organization that performs its functions.

1.2. Finances in public and private domain

In order to provide the products and services useful to society, both the public and the private domain are needed. We are talking exclusively about the private domain if it

has a competitive economy with products and services made from private capital. The public domain has a forecasted, concentrated economy, the products and services being made from public funds.

In reality, both the private and the public domain exist, their importance differing from one state to another. Thus, we can discuss about mixed economies, characterized by the co-operation of the public domain with the private one.

Capitalist economy is characterized by the American professors Richard and Peggy Musgrave as "a deeply combined system in which public and private sector forces interact and the economic system is neither public nor private, but involves a mix of the two sectors''(Musgrave, 1993).

The capital of the mixed economy is part of the value of a nationality; it comes from the built of the unfinished domestic product and imports, used for consumption, the built of unfinished capital and exports. At national level, financial resources are represented by the necessary capital in order to achieve economic and social goals, resulting from the unfinished domestic product and external sources. We can classify financial resources as belonging to:

a) Public organizations and administrations
b) Private and public commercial institutions
c) Non-profit associations
d) Individuals

There are obvious connections between the above mentioned categories, cumulative of the financial capital necessary to achieve the specific objectives of the organizations and distributive of the moneyed capital for the financial support of the establishment of products and services of public or / private nature. The materialization of financial budgets differs in the public domain from the private one (table no. 1).

Table no. 1. The build of financial funds

Organizations and public administration	Private organizations
duties, dues, compulsory contributions from economic agents, banks, other organizations, individuals	savings of owners (associates, shareholders, owners)
public sales	bank or capital market loans
temporary treasury resources repayable from banks	subsidies from the public budget
public loans	profit or surplus reinvested
coin emission	other sources (attracted, irredeemable or grants)

The result of the intersection of points where the option for the private and public domain is equal, followed by the same stage of satisfaction, is a curve called the "recklessness curve." This represents the people manifestation as a product of the connection between the public and the private domain. If we relate to reality, the demand for resources is backwards proportional to resources (the demand for resources increases, resources become more limited). Therefrom results the budgetary constraints, which change the recklessness curve. The decisions that intend the provision of financial resources are based on aggregate demand and the distribution of expenditures.

1.3. The finances functions

1.3.1. The distribution function

The distribution function refers to the establishment of financial resources and their distribution. In the organization of public financial resources, the fields involved are: public, private, mixed, population, in relation to financial capacity. The distribution of financial resources is done on activities such as:

a) Education, culture, health
b) Social insurance and social protection
c) Communal household and social housing
d) National defense
e) Public order
f) Public debt
g) Other destinations.

Thus, according to this function the state has the obligation to intervene in the rectification of the disproportions between the adherents of the company, individually achieving the basic needs. The distribution of financial resources is made as a priority, for example: the construction of a road, social housing for the people in financial difficulty, maintaining the ecological balance, the construction of locations affected by natural disasters. The distribution of funds at the level of the European Community is made with priority to states in transition in order to protect the environment, the development of the infrastructure, the development of small and medium-sized private enterprises, the restoration of the agricultural sector, etc.

1.3.2. The control function

The control function of public finances is characterized by the fact that finances are available to the state and control the way of summation, distribution, use of financial resources because public finances are a segment of unfinished internal product, necessary to fulfill social needs.

The financial control bodies that serve this function are: the Ministry of Finance, the Court of Accounts, and the Financial Guard.

In the case of organizations' finances, the control function has a ascertaining and corrective aspect and a preventive one, which respects the economic-financial and fiscal legislation, defends the integrity of the patrimony, uses resources rationally, prevents losses, increases efficiency, etc. This function is performed by specialized personnel, shareholders, owners of sponsored organizations, etc.

1.4. Public finances, private finances and financial market

Public finances are made up of resources, expenditures, loans and public debt, associated to the state, public and territorial-administrative authorities, and are materialized in the public budget. Public finances "are expressed exclusively in money; expresses a transfer of values, not a change in the form of value; it does not suppose the refund (the refund appears as an exception); it is characterized by the absence of the consideration, as a direct and immediate equivalent (the consideration appears only as an exception); they are used to achieve objectives of general interest" (Moraru, 2008).

Private finances are made up of resources, expenses, loans, debts and payment obligations of private organizations. Private finances are producing goods and services to fulfill individual needs.

Banks and other financial institutions that attract capital form the financial market, which ensures the attraction of savings and their placement in the private or public domain

as deposits, treasury bills, and bonds, newly emissive shares, financial titles. Repetitive reselling of these is carried out on the Stock Exchange.

Public finances are used to fulfill the general needs of society. "The objective nature of public finances certifies to the fact that these exist in order to serve the achievement of well-defined goals, the fulfillment of tasks that could not be performed by any other means or ways, which means that they are not the expression or desire of anyone or following the decision of a public authority "(Ungureanu, 2007).

Between the public finances, the private finances and the financial market there are relations of independence, interdependence and complementarity, the resources used to perform the functions of the state and of the public-administrative-territorial organizations are obtained by constraint or by contractual relations from the private sector. The private domain acquires its own financial resources from the financial market, contractually, using the demand and the supply of capital, from subsidies or from public sources.

The public finances are subordinated to the public law, while the finances of the private system to the commercial law. The three components of finance study are specific to the market economy, competitive.

Under the conditions of globalization, the transfers of financial funds, of capital have increased, the foreign investments lead to the globalization of the financial market and to the standardization of financial products. Thus, finance is an indispensable function of the management.

2. Managerial finances, function of financial management

2.1. The systemic approach of managerial finances

The management of finances in the public domain is associated with the government, the executive politico-administrative power given by the Parliament, and the organization is carried out by the Ministry of Finance. The management of finances is a function of management in the private domain, and the financial manager takes over by delegation a part of the tasks, the rest being delegating.

Financial management continuously assures the institution with the necessary resources and uses them efficiently. Financial management can be defined as the science that studies the processes of leading, predicting, organizing, training and controlling the financial capital available in the organization in order to achieve the proposed objectives.

Financial management is a complex of scientific notions, methods and techniques of evaluating the need for financial capital and ways of obtaining them, of economic-financial procedures, means for establishing, distribution and usage of budgetary resources, if issuing and implementing budgets, of improving the managerial decisions of a financial nature, of estimating the economic efficiency of the activity.

2.2. The organization as a financial system

The notion of organization can be associated with a company, public institutions, a design or educational institute, a non-profit association. The organization includes one or more departments, compartments, sections, which perform specific functions. An organization is a system made up of subsystems (departments).

The organization is therefore a system, meaning a set of parties that interact, perform processes or solve tasks in order to achieve the proposed objectives. The organization, as a system, is made up of inputs, processes, outputs and control or feedback.

It initially receives inputs that are processed into outputs and then checked, determining whether they achieve the system objectives, correcting them if necessary. Whatever enters in the organization, are inputs or resources for the process that takes place within the system or subsystem. The manager is responsible for how they are used.

Following the process of transforming resources, results are obtained, which can be products or services.

2.3. Monetary value

The unit of measure for inputs (resources) and outputs (results) is money, so the procedure of reflecting in monetary capital resources and results is indispensable.

In order to anticipate the usage or progressive wastage of fixed assets used in the transformation of resources, depreciation is used as an expense of the organization that is withheld from revenues. This notion is attributed to objects, fixed assets with a sufficiently high value, which transfer their value to the products or services created by the organization in annual rates. It is a difficult operation because not all resources, products, services can be expressed in money.

Depreciation is part of the organization's management policy and is strictly dependent on the cost of acquiring fixed assets, on their viability, on residual value and estimating the annual profit resulting from the use of fixed assets or the effectiveness of their use in non-profit organizations.

The organization's inputs or resources can be:

a) Of material nature, for example land, buildings, machinery and equipment, machinery and other means of transport, raw materials and materials needed in the operational processes (steel, plastic granules, meat, vegetables, salt, sugar)

b) The human resource, made up of people paid as employees, with a labor contract, who negotiates a salary that allows assigning a monetary value to it or voluntary people, who perform different jobs in the sphere of production or provide services.

c) The money in the form of inputs or outputs, has as sources: the initial capital invested, loans and credits, donations, the sale of products and services, budgetary allocations, the reinvested profit

d) Information

e) Intangibles, meaning software, projects, customer portfolio, organization’s location, reputation, registered trademark, license, inventions and innovations, value of managers and staff.

The outputs or results of the organization can be tangible, measurable, or weighed (the products), others are intangible (the services). Ideally is for them to be tangible, for the benefit of the organization and the beneficiaries, the values attached to the resources and the results we find recorded in the accounting.

The manager allocates the resources; these are under his direct control with the accountant's support. Control of financial resources means measuring the inputs with emphasis on the efficiency of the use of resources, it means measuring the outputs taking into account the quantitative and qualitative aspects of the products and services and any long-term results.

Financial management represents the organization’s activity in order to obtain and use the resources necessary to achieve the proposed objectives. Financial management involves the following stages:

a) The planning stage of the program, of operations and investments

b) The stage of implementation of financial plans, financing, control of administrators

c) The stage of evaluating the performance of the managerial information system

d) The specific audit or financial control stage.

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BOARD DILIGENCE AND FINANCIAL PERFORMANCE: EVIDENCE FROM NIGERIAN DEPOSIT MONEY BANKS

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Abstract: *The study examined the effect of board diligence on financial performance of listed deposit money banks. Data of the 10 selected DBMs were obtained from their annual financial statements from 2012 to 2018 using an ex post fact research design and purposive sampling technique. The data were analysed using inferential statistics and hypothesis testing using Generalised Method of Moment (GMM). The study found that board diligence has significant negative effect on financial performance of Nigerian listed DBMs. As regards the controlled variables, only capital adequacy and firm size were found to positively and significantly influence financial performance. Liquidity ratio was found to have direct but no significant effect on financial performance while nonperforming loan negatively and insignificantly affect financial performance. The study concludes that bard diligence reduces financial performance. It is therefore recommended that preference should be given to the quality of board meeting and not the quantity and that issues that have implications on performance should be given utmost attention at board meetings.*

Keywords: *Board meetings, profitability and GMM.*

1. Introduction

The consequential impact of the global financial crisis of 2007–2008 that hard hit global economy on the banking sector have highlighted the need for a more controlled operational environment, increased governance complexity and additional calls for effective monitoring by banks' boards of directors (seeKörner2017). A unique corporate governance mechanism is a manifestation of dominant role of boards of directors on performance and risk-taking behavior (Elyasiani and Zhang, 2015; Faleye and Krishnan, 2017). It is the expectation of both the shareholders and regulators that boards should establish an effective risk monitoring system so as to eradicate misconduct and excessive risk taking (Kress2018). One of the ways through which the board discharges its monitoring and controlling responsibility is through board meetings. According to Jensen (1993) board meetings and frequency are regarded as tools for enhancing the monitoring activity of directors and it has implication on performance. Board meetings are unique component of board supervisory function as outstanding issues and potential solutions relating to an entity are discussed at the meeting. It is thus being regarded as essential component of good governance (Vafeas, 1999; Conger, Finegold & Lawler, 1998; Lipton & Lorsch, 1992). Eluyela et al (2018) regards board meetings as avenue for effective coordination of opinions for attainment of firms' goals and objectives.

According to Kakanda et al. (2016a) business survival and growth is a reflection of corporate performance. Marn and Romauld (2012) relate companies' performance to its efficient and effective uitilisation of its scarce resources to accomplish its goals. Corporate performance is majorly measured by the ability of companies' directors to maximize the wealth of its shareholders. Corporate performance it often referred to as profitability which is conceptualized by Gatsi, Gadzo and Akoto (2013) as final outcome of firms' financing and investing activities and as well as how management's is able to optimize profitability via capital structure decision. Profitability are commonly measured mainly by 5 variants like return on asset, return on equity, return on capital employed, gross profit margin and net profit margin(see Ilaboya, 2008).

In Accounting and finance literature, the nexus between board meetings frequency and financial performance has engendered series of arguments. Basically, there exist two schools of thoughts on their nexus. The first school of thought are those that believed that board effectiveness in the fulfillment of their functions of setting strategy and monitoring of management, there is a need for the board of directors to meet at regular interval (Vafeas, 1999). This argument can be supported by the role of board meetings to reduce agency problem by providing avenue for monitoring and control which will assist in aligning the interest of the managers with that of shareholders. On the contrary, the second school of thought are those that assert that board meetings frequency results to wasting management time and effort and waste of company's scarce resources by placing financial burden such as travelling expenses and sitting allowance to director on the company They conclude that it is the quality of meetings that improve performance and not quantity (see Ntim and Osei, 2011; Taghizadeh and Saremi, 2013; Oyerinde, 2014).

Prior literatures in the Nigerian context have majorly focused on corporate governance and financial performance in general (see Umar & Sani, 2020; Oyedokun, 2019; Ilaboya and Obaretin, 2015). While the nexus between board meetings and financial performance has suffered significant neglect in the Nigerian banking system. To as observed, the only study that has specifically addressed the issue of board meetings and financial performance is that done by Eluyela et al (2018). However, there are some clear gaps in their work; first there data span from2011 to 2016; they have viewed the nexus between board meetings and financial performance from static perspective, third most of the variables that are likely to influence profitability aside from board meetings such as liquidity, nonperforming loan and capital adequacy were not included in the model. This may produce unsatisfactory results and thus the need for re-examination. Arising from this, the study examines board diligence and financial performance of Nigerian deposit money banks from 2012 to 2018 using generalized method of moment.

2. Literature Review

2.1. Conceptual Review

Board Meetings and Financial Performance

Board diligence in this study is a proxy of board meetings. Board meeting is an important component of corporate governance as it provides an avenue for directors on the board to deliberate on issues and make strategic decisions that are germane to the success of a company and attainment of its overall objectives. According to Eluyea et al (2018), regular board meetings is an internal issue at the discretion of chairman of board meeting as there is no explicit governance law stipulating the minimum number of meetings. Empirical literature as to board meetings and financial performance nexus has produced conflicting evidences. Scholars like Gosh (2007) are those that have found direct and significant effect of board meetings on financial performance. Contrarily, Johl, Kaur and Cooper (2013) reported negative association. According to (Chorsch & Maclver (1989) cited in Ilaboya and Obaretin (2015) board meetings frequency is discouraged as it is believed to engender wasting use of organization resources on activities that are counterproductive.

2.2. Theoretical Framework

The popular agency theory is the relevant theoretical framework for this study. The agency problem is the outcome of ownership being separated from management where agents (managers) are appointed by principals (shareholders) to run and management the business on their behalf. As principals are unable to directly observable the behavior of agents there arises conflict of interest where managers are tempted to pursue their own self

aggrandizing goals as against those of their principals. According to Eluyela et al (2018), the agents are appointed and corporate governance mechanism instituted so as to ensure creation of a disciplined atmosphere, setting of timely and achievable strategic plan and the effective control of the management so as to maximize shareholders wealth via improved financial performance**. to have this actualized,** (Ntim and Osei, 2011) argued in favour of regular board meetings so as to increase their advisory, controlling and monitoring capacities and ensuring discipline so as to improve organizational performance

2.3. Empirical Review

Eluyela et al. (2018) using fixed effect regression on data of 14 sampled DBMs from 2010 to 2016 found among other that board meetings has positive insignificant effect on financial performance. Hanh, Ting, Kweh and Hoanh (2018) selecting 94 firms quoted in Ho Chi MinhStock Exchange from 2013 to 2015 found that board meetings negatively affect profitability. Araoye and Olatunji (2018) found from the investigation of board meetings and financial performance of 15 selected insurance companies from 2006-2017. The finding shows negative and insignificant effect of board meetings on financial performance. Urhoghide and Omolaye (2017) found that board diligence has no significant positive effect on profitability of oil and gas companies in Nigeria. Akpan (2015) using data of 79 quoted Nigerian companies from 2010 to 2012.the result of the regression analyses reveals that board meetings, directors` equity and board size are negatively significant on profitability. Audit committee meetings are positively significant while gender diversity and board age are not significant measured with ROE. Al-Daoud, Saidin and Abidin (2016) using GMM on data of 118 listed Amman companies from 2009-2013 found that board meetings positively influence profitability Johl, Kaur and Cooper (2015) focusing on 700 listed companies in Malaysia for 2009 found that board diligence has negative effect on performance. Ilaboya and Obaretin (2015) in Nigeria reported positive insignificant influence of board diligence on financial performance of Nigerian quoted food and beverages companies.

H_{01}: *Board diligence has no significant effect on financial performance of Nigerian DBMs.*

3. Methodology

3.1. Sample

10 DBMs represent the study's sample. 15 DBMS were listed on the Nigerian Stock Exchange. The 10 banks were purposively selected while an *ex post facto* research design was used.

3.2. Source of Data

Data were obtained from the annual reports and financial statements of the banks.

3.3. Measurement of Variables

The only dependent variable is financial performance which is measured by ROA. It is measured as the proportion of profit after tax to total asset. Several researchers like Sanyaolu *et al* (2019) have proxied profitability by ROA in their studies. One independent variable is used by the study to surrogate board diligence which is the number of meetings held in a fiscal year bt the directors on the board. Furthermore, four variables are used as control variables. These variables are believed to be potential determinants of ROA. They are: capital adequacy which is measured as proportion of equity capital over total asset, loan to deposit ratio which is a measure as ratio of bank loan to total asset, nonperforming loan ratio which is the proportion of loan performing loan to total loan and bank size which is the natural logarithm of bank total asset.

3.4. Method of Data Analysis

The study analyzed the data by using descriptive correlation and generalized methods of moment which is appropriate when the number of observations exceed time series using of E-views 9.]

3.5. Model Specification

The model of the study is specified below:

Y=F(X)

Where Y = financial performance

X= bard diligence

Statistically, the model is restated as:

ROA = F (BD, CAR, LDR, NPLR & FS)

Econometrically, it can be restated as

$ROA_{it}= \beta_0+\beta_1 ROA_{it-1} + \beta_2 BD_{it} + \beta_3 CAR_{it} + \beta_4 LDR_{it} + \beta 5 NPLR_{it}+\beta 6 FSZ+ e_{it}$(2)

Where;

ROA_{it} = return on asset of firm i in period t

ROA_{it-1} = previous year return on asset of firm i in period t

BDit = board diligence of firm i in period t]

CAR_{it} = capital adequacy ratio of firm i in period t

LDR~~it~~ = loan to deposit ratio of firm i

$NPLR_{it}$ =Nonperforming loan ratio of firm i in period t.

SZ_{it} = firm size of firm i in period t

β_0 = Intercept term

β_{1-} β_4 = Regression coefficient of the independent variable

e_{it} = Stochastic error term

4.1. Descriptive Statistics

Table 1: Descriptive Statistics.

	ROA	BD	CAR	LDR	NPLR	LASSET
Mean	0.017003	6.228571	0.126438	0.699504	0.076550	20.98964
Median	0.015478	5.500000	0.138145	0.703721	0.037300	21.04478
Maximum	0.119833	11.00000	0.803866	1.277526	0.970000	22.44036
Minimum	-0.105138	4.000000	-0.607458	0.090703	0.010000	17.87634
Std. Dev.	0.026249	2.001242	0.144500	0.194458	0.129430	0.959320
Skewness	-0.840209	0.895472	-1.131955	-0.071494	5.085210	-0.763573
Kurtosis	11.91711	2.943950	19.56902	3.959868	33.94428	3.464079
Jarque-Bera	240.1542	9.364313	815.6680	2.746896	3094.542	7.111902
Probability	0.000000	0.009259	0.000000	0.253232	0.000000	0.028554
Sum	1.190179	436.0000	8.850659	48.96525	5.358500	1406.306
Sum Sq. Dev.	0.047542	276.3429	1.440747	2.609150	1.155902	60.73950
Observations	70	70	70	70	70	70

Source: Authors Computation (2020) using E-view 9

The table above shows the statistical attributes of the variables of the study. ROA is averaged 0.017 with a minimum of -0.105 and maximum of 0.12. Board diligence has a mean value of 6.2 and ranges from 4 to 11. Capital adequacy ratio is averaged 12.6% and varies from -60.7% to 80.3%. Loan to deposit ratio is averaged 70% with a minimum of 9.1% and maximum of 128%. Nonperforming loan ratio has a 7. 7% and ranges from 1% to 0.97%. Size has an average value of 20.98964(log inverse) and varies from 17.87634 to 22.44036. As to the normality of the variables all but loan to deposit ratio are normally

distributed as the probabilities of their Jarque-Bera are significant at 5%. As to the Kurtosis, only Board diligence is found to be platykurtic as the value is below the threshold of 3 while all others are leptokurtic

4.2. Correlation Analysis

Table 2: Correlation Matrix

	ROA	GM	CAR	LDR	NPLR	SIZE
ROA	1.000000					
GM	-0.143007	1.000000				
CAR	0.772339	-0.096595	1.000000			
LDR	0.083054	0.187795	0.041841	1.000000		
NPLR	-0.099053	-0.026266	0.075893	0.296981	1.000000	
SIZE	0.322073	0.204254	0.061189	0.142097	-0.126410	1.0000

Source: Authors Computation (2020) using E-view 9

The table above shows the correction among all the variables of the study. As it is shown above, none variables has a correlation coefficient in excess of 0.80(Field, 2005). As such, there is no problem of auto correlation.

4.3. Result

Table 3: GMM Analysis for board diligence and financial performance

	Pooled OLS Estimation			Fixed Effect			Random Effect		
Regressors	Coeff	t-stat	p-val	Coeff	t-stat	p-val	Coeff	t-stat	p-val
C	-0.236701	-4.247940	0.0001	-0.486080	-2.581213	0.0139	-0.253205	-4.418392	0.0001
ROA(-1)	0.126266	1.307439	0.1976	-0.004642	-0.046015	0.9635	0.101972	1.130450	0.2641
GM	-0.002323	-2.227353	0.0309	-0.001087	-0.724247	0.4735	-0.002221	-2.153279	0.0366
CAR	0.089960	5.355996	0.0000	0.058818	2.956277	0.0054	0.085154	5.310391	0.0000
LDR	0.018219	1.561418	0.1253	0.012654	0.923148	0.3619	0.018440	1.672948	0.1011
NPLR	-0.021323	-1.450352	0.1537	0.004111	0.214657	0.8312	-0.017752	-1.248667	0.2181
LASSET	0.011502	4.104919	0.0002	0.023365	2.544197	0.0153	0.012278	4.288389	0.0001
R-square	0.716197					0.81208			0.677764
Adj.R-square	0.679179					0.73590			0.635733
J-stat	46.000					37.000			46.000
Prob J-stat	0.0000					0.0000			0.0000
Durbin Watson	1.781327					2.0229			1.827054
Instrument rank	8					17			8
Hausman Test	12.092251		0.0599						

Source: *Researchers' Computation (2020) Using E-views 9*

The adjusted R-Square of 0.636 implies that almost 64% variation in profitability is accounted for by the dependent variables (previous year profitability, board diligence, capital adequacy, loan to deposit ratio, non performing loan ratio and size. The J-statistics value of 46. 0 with corresponding probability of 0.000 implies that the model as a whole is statistically significant at 1% level of significance. The Durbin Watson value of 1.827 shows that there is no problem of autocorrelation.

We found that last year profitability does not significantly drive current year profitability even though it is positive. This may be an indication of low retention ratio of profit for growth potential of DBMs.

Contrary to our expectation, board diligence exert significant negative influence on profitability with a t-value of (-2.153279) which implies that increase in board meetings will significantly reduce profitability. Increase in board meetings frequency according to Johl *et al* (2013) amounts to wasting hard earned productive resources to unproductive activities. It is therefore imperative for banks to hold optimum meetings as too much board meetings frequency could lead to wasting quality time and efforts (see Ilaboya and Obaretin, 2015). This outcome is in line with that of Ting, Kweh and Hoanh (2018), Johl, Kaur and Cooper (2015) and Akpan (2015) who found significant negative effect of board meetings on profitability while it contradicts findings by Ilaboya and Obaretin,(2015) that found positive insignificant effect of board meetings on profitability. We therefore reject the null hypothesis H_{01} that board diligence has no significant effect on financial performance of Nigerian DBMs.

In an attempt to avoid spurious result, other variables outside board meetings such as capital adequacy, loan to deposit ratio, nonperforming laon ratio and bank size were introduced as control variables. Capital adequacy shows significant positive effect on profitability with a t-value of 5.310391.this implies that banks capital strength is a significant driver of profitability of Nigerian DBMs. This finding is in line with that of Sanyaolu et al (2019) that established significant positive effect of capital adequacy ratio of Nigerian DBMs. The implication of this finding according to Sanyaolu et al(2019) may be due to the fact that capital adequacy may afford banks the opportunity of having sufficient fund to finance loan request of customers and as well as being able to invest in new technology that reduces operational cost.

Liquidity ratio was found to have positive but no significant influence on profitability. This means that liquidity ratio is not an important driver of profitability in the Nigerian DBMs. This outcome is in disagreement with that of Bagh, *et al.,* (2017) that reported positive significant effect of liquidity ratio on profitability.

Nonperforming loan exert negative but no significant influence on profitability. This is consistent with our a priori expectation as non performing loan is written off of profit it has tendency of reducing profitability. This finding is in contrast with that of Annor and Obeng (2017) that found positive significant influence of nonperforming loan on profitability.

Size positively and significantly affects profitability. This is also in line with our expectation as larger banks may enjoy economies of scale that reduce average cost and boost profitability. This is consistent with the finding of Rahman, Hamid and Khan (2015) that show positive significant effect of size on profitability.

5. Discussion and Conclusion

The study examines the effect of board diligence on financial performance of 10 selected listed DBMs from 2012 to 2018 using GMM. The main finding of the study is that board diligence has significant negative effect on financial performance measured by return on asset. This finding is supported by those of Ting, Kweh and Hoanh (2018), Johl, Kaur and Cooper (2015) and Akpan (2015) that reported significant negative effect of board diligence on profitability. As to the control variables, only two (capital adequacy ratio and bank size) were found to exert positive significant influence on profitability while the study could not establish significant influence of loan to deposit ratio (liquidity ratio) and nonperforming loan ratio on profitability.

Generally, empirical investigations have mainly focused on corporate governance and profitability in general with very few studies that specifically addressed the issue of board diligence on profitability of Nigerian deposit money banks. This study therefore examines board diligence on financial performance of Nigerian DBMs from dynamic

perspective. The study found that board diligence negatively and significantly impact profitability. This finding could be linked to the fact that frequent board meeting could lead to diversion of management time and effort to unproductive activities and as well as diverting firm scarce resources on irrelevant and unproductive activities such as payment of high travelling and seating allowance to directors on the board and as well as other associated costs.

Our study therefore recommends that quality of board meetings should be given priority and not its frequency. Also, important issues that are likely to translate to better performance and maximization of shareholders wealth should be prioritized. Despite our study, it is important to emphasize that our study has its own limitations. We examined board diligence and financial performance of Nigerian DBMs, future researchers can extend the scope by focusing on the non financial sectors and other non-bank financial institutions. Also, the inclusion of variables such as ownership structure, audit committee meetings may produce better opportunity for generalization.

Appendix:

Table 1: List of sampled Banks

S/N	Name of Banks
1	GT Bank Plc.
2	UBA Plc
3	Access Bank Plc
4	Zenith Bank Plc
5	First Bank Plc
6	Sterling Bank Plc
7	Union Bank Plc
8	Fidelity Bank Plc
9	Wema Bank Plc
10	Unity Bank Plc

Source: Authors' compilation (2020)

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LEGAL ASPECTS REGARDING THE ACCESS OF INDIVIDUALS TO EUROPEAN DOCUMENTS

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Abstract: *The right to information is a fundamental human right, guaranteed by international law and which has been transposed into Romanian law. Information has an essential role in social progress, in promoting social values, being also called "the oxygen of democracy". The individual's right to information underlies his participation in the life of society, in democratic accountability and information must flow in a free flow, in two directions, from society to the citizen and vice versa. In most democratic countries, and not only, this right is stipulated in legal texts of the highest level (constitutional texts), but unlike other rights, this is a relative right and not an absolute one, being susceptible to restrictions or limitations. The limitation of the right to information must be proportionate to the interest protected by this restriction on the exercise of the right.*

Keywords: *information, European citizen, public institution.*
JEL classification: *HO, K12.*

1. Introduction

The free and unrestricted access of the person to any information of public interest is one of the fundamental principles of the relations between persons and public authorities, in accordance with the Romanian Constitution and with the international documents ratified by the Romanian Parliament.

Information of public interest means any information concerning the activities or resulting from the activities of a public authority or public institution, regardless of the medium or the form or manner of expression of information[1] and should not be confused with information on personal data, whereby means any information concerning an identified or identifiable natural person.

One issue under discussion in societies with a democratic tradition is the transparency of public institutions. When we refer to the subject of institutional transparency, we must take into account the fact that the Romanian society had an approach inclined especially towards the opacity of the institutions, limiting the access to information regarding the activity of public institutions and the decision-making process. The integration in the Euro - Atlantic structures determined the adoption of normative acts that would guarantee the right to information of the citizens and the freedom of expression. Also, the notion of "transparency" in the activity of state organizations was expressly enshrined (Alina Popescu, 2018).

2. The access to information of public interest

Ensuring by public authorities and institutions access to information of public interest is done ex officio or upon request, through the public relations department or the person designated for this purpose, respectively the spokesperson of the public institution or authority.

In order to ensure the access of any person to the information of public interest, the public authorities and institutions have the obligation to organize specialized compartments of information and public relations or to designate persons with attributions in this field.
Access to information of public interest is achieved through:

1 Article 2 lit. (b of Law no. 544 of October 12, 2001 on free access to information of public interest published in the Official Gazette of Romania, Part I, until January 31, 2013.

a) display at the headquarters of the public authority or institution or by publication in the Official Gazette of Romania or in the mass media, in its own publications, as well as in its own Internet page;

b) their consultation at the headquarters of the public authority or institution, in spaces specially destined for this purpose.

Public authorities and institutions have the obligation to make available to interested parties the privatization contracts they have concluded by consulting at their premises, except for privatization contracts containing information in the field of national defense, security and public order, if they fall into the categories classified information, privatization contracts containing information on the deliberations of the authorities, as well as those concerning the economic and political interests of Romania, if they are part of the category of classified information, as well as contracts concerning commercial or financial activities, if their publicity affects the right to intellectual or industrial property, as well as the principle of fair competition.

The following are also exempted from free access by citizens:

a) information on personal data, according to the law;

b) information on the procedure during the criminal or disciplinary investigation, if the result of the investigation is endangered, confidential sources are disclosed or the life, bodily integrity, health of a person are endangered as a result of the investigation carried out or in progress;

c) information on judicial proceedings, if their publicity undermines the assurance of a fair trial or the legitimate interest of any of the parties involved in the proceedings;

d) information whose publication prejudices the measures for the protection of young people.

At national level, public authorities and institutions are obliged to provide persons, at their request, with information of public interest requested in writing or orally, but requesting and obtaining information of public interest can be done, if the necessary technical conditions are met, and in electronic.

For the information requested orally, the officials within the information and public relations departments have the obligation to specify the conditions and forms in which the access to the information of public interest takes place and may provide the requested information on the spot.

The information of public interest requested verbally is communicated within a minimum program established by the management of the public authority or institution, which will be displayed at its headquarters and which will be mandatory during the operation of the institution, including one day a week, after the program Operating.

The information of public interest requested verbally by the mass media will be communicated, as a rule, immediately or within 24 hours at most.

Information that favors or conceals a violation of the law by a public authority or institution may not be included in the category of classified information and constitutes information of public interest.

Information on the personal data of the citizen can become information of public interest only insofar as it affects the capacity to exercise a public office.

Public information of personal interest may not be transferred between public authorities except on the basis of a legal obligation or with the prior written consent of the person having access to that information.

At European Union level, the Treaty on European Union enshrines the notion of transparency, according to which decisions must be taken in the most transparent way possible and as close as possible to the citizen.

Transparency ensures better citizen participation in the decision-making process, guaranteeing greater legitimacy, efficiency and accountability of the administration to citizens in a democratic system, while contributing to the strengthening of the principles of democracy and fundamental rights.

Within the institutions of the European Union, the right of access shall also apply to documents relating to the common foreign and security policy and to police and judicial cooperation in criminal matters. Each institution should follow its own security rules.[1]

In order to improve the transparency of the work of the institutions, the European Parliament, the Council and the Commission should allow access not only to documents originating from the institutions but also to documents received by them. In this context, it must be remembered that Declaration no. 35 annexed to the Final Act of the Treaty of Amsterdam provides that a Member State may require the Commission or the Council not to disclose to third parties a document supplied by that State without its consent.

Therefore, as a general rule, the public should also have access to all documents of the institutions at EU level. However, certain public and private interests should be protected, as at national level, by a system of exemptions. Institutions should be allowed to protect their internal consultations and deliberations, where necessary to maintain their capacity to carry out their tasks. When assessing the need for an exemption, the institutions should take into account the principles enshrined in Community legislation on the protection of personal data in all areas of activity of the Union.

In view of these aspects, it appeared imperative to adopt a document with normative value, meant to regulate the free and unrestricted access of the person to any information of public interest and at European level.

To this end, Regulation (EC) no. Regulation (EC) No 1049/2001 of the European Parliament and of the Council regarding public access to European Parliament, Council and Commission documents.

Thus, any citizen of the Union and any natural or legal person residing or having its registered office in a Member State has a right of access to documents of the institutions, subject to compliance with the principles, conditions and limits imposed by this Regulation.

For their part, the institutions may, subject to the same principles, conditions and limits, allow access to documents for any natural or legal person not resident or established in a Member State.

As in the case of national legal provisions, this right implies access to the content of all documents held by an institution, ie drawn up or received by it and in its possession, in all areas of activity of the European Union.

And by correspondence with national law, except for the oral request, the documents shall be made available to the public either by written request or directly, in electronic form, or by means of a register. This provision applies to all documents held by an institution, ie drawn up or received by it and in its possession, in all areas of activity of the European Union.

As in the case of national provisions, there are also at European level certain documents exempted from free and unrestricted access of the person. They, bearing the title of "sensitive documents", cannot be consulted by any European citizen.

Sensitive documents are documents issued by institutions or agencies set up by them, Member States, third countries or international organizations, classified as "TRÈS SECRET / TOP SECRET" (Strict secret), "SECRET" (Secret) or "CONFIDENTIEL" (Confidential) under the rules in force within the institution concerned, which protect the

1 Article 28 (1) and Article 41 (1) of the EU Treaty.

fundamental interests of the European Union or of one or more Member States in certain areas1 and, in particular, in the areas of public safety, defense and military affairs.

Exceptions are also made.

Thus, the institutions shall reject requests for access to a document where disclosure could undermine the protection of the public interest as regards public safety, defense and military affairs, international relations, financial, monetary or economic policy of the Union or a State. member, privacy and integrity of the individual with regard to the protection of personal data.

Institutions shall reject requests for access to a document if the disclosure of the content could harm the protection of the commercial interests of a particular natural or legal person, including intellectual property, legal proceedings and legal advice, the objectives of inspection, investigation and audit, unless a higher public interest justifies the disclosure of the content of the document in question.

Access to a document drawn up by an institution for its internal use or received by an institution and relating to a matter for which the institution has not yet taken a decision shall be refused if disclosure of its contents would seriously affect the decision-making process of that institution. Unless a higher public interest justifies the disclosure of the content of the document in question.

Access to a document containing opinions intended for internal use during deliberations and preliminary consultations within the institution concerned shall be refused even after the decision has been taken, if disclosure of its contents would seriously affect the decision-making process of that institution, unless which a higher public interest justifies the disclosure of the content of the document in question.

All these exceptions apply only during the period when the protection is justified by the content of the document and can be implemented for a maximum period of thirty years. In the case of documents falling within the exceptions concerning privacy or commercial interests and sensitive documents, the exceptions may continue to apply, if necessary, even after the expiry of this period.

At the same time, a Member State may require an institution not to disclose the contents of a document issued by it without its prior consent, and if only part of the required document falls within one or more of the above exceptions, the others parts of the document are disclosed.

3. Conclusions

It is rightly considered that the right to information is justifiably subject to limitations, because in the broad framework of human rights ("universal, indivisible and interdependent") they must be approached in a balanced way, on the idea of balance of these rights, all of equal value, so that the exercise of a right, by an individual, does not infringe another right, of another individual. Another dimension of the fundamental right to information is its potential to alleviate disparities between nations, between regions of the same state, generally between individuals. Access to new information technologies, encouraging policies on free, effective access to information, can strengthen social development and encourage sustainable development (Popescu, 2018).

The corollary of free access to information must be the balance between transparency, the need to know and respect the rights and freedoms of others, as well as ensuring the proper functioning of institutions. We can conclude that the right to

1 Article 4 (1) (a) of the Regulation.

information of citizens corresponds to a correlative obligation to inform, the state, but also other social actors (Popescu, 2018).

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3. Regulation (EC) No. 1049/2001 of the European Parliament and of Council of 30 May 2001 regarding public access to European Parliament, Council and Commission documents.

A NEW ERA IN PUBLIC FINANCE – HOW THE COVID-19 IS RESHAPING THE SCOPE AND FUNCTIONS OF PUBLIC FINANCE IN A TIME OF MIGRANT CRISIS

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Abstract: *Throughout time public finance, more exactly the concerns regarding the income and the expenditure of public authorities and their adjustment, has been a key standing point in understanding how public finance can impact the economy. However, the current international COVID-19 crisis is reshaping the scope of public finance, meaning the ways public income, expenditure, debt and the general financial administration is being understood. Also, the main functions of public finance (allocation, distribution and stabilization) are being redesigned in order to adapt to a new are of both health and financial crisis. The purpose of this article is to take a look at the latest developments regarding these main themes, but also to anticipate the evolution of both health and public financial systems around the world.*

Keywords: *scope, functions, migrant crisis, financial administration, public finance*
J.E.L. Classification: *H12, E60, J60.*

1. Introduction

The virus known as COVID-19 (more commonly referred to as the coronavirus) has appeared at the beginning of December 2019 in China and since the beginning of January 2020 has spread around the world, with more than 2.5 million active cases rapidly growing and creating mass panicking.

Faced with this new challenge, governments are forced to recognize that their health systems are completely overloaded and thus there needs to be a new and urgent way public authorities understand spending their resources. The ones in need in these times are mostly the ones infected with the virus, however the spread of the virus has brought along mass shutdown of businesses, with governments forcing people to stay in their homes and promising them to do everything to keep the economies floating and financially backing companies to survive. All these financial efforts of the governments lead to the idea that the current volatile situation may be the beginning of a new era in public finance, where the scope and the functions of public finances are being adapted to say the least.

In order to understand how the pandemic crisis is affecting public finances we must first acknowledge their importance in the functioning of central or local public authorities.

2. Acknowledging the role of public finances

The study of public finances is manifested in financial, economic, and social terms. On the occasion of the collection of financial resources through taxes, fees and contributions collected and the financing of public expenditures on various destinations, there is an extensive process of redistribution of income and wealth of individuals and legal entities. Precisely, this redistribution assumes various forms, such as:

- granting aids, allowances, pensions, scholarships for persons belonging to a certain social category;
- subsidizing from the budget the production or sale of certain goods and services (e.g. heating);
- free supply of public goods (public order, social protection, national defense, education up to certain degrees, health care, etc.).

Through the transfer of purchasing power by public finances there is a change in social relations, affecting: the process of social reproduction, the economic potential of enterprises, incomes and wealth of citizens, the standard of living of the population, and in

general, the quality of life. Public finances are additionally implemented to ensure the economic and social development of the country in a balanced environment.

Through fiscal and budgetary instruments, public authorities influence economic processes and eliminate economic imbalances that occur, as follows:

- reduction of taxes to prevent inflationary phenomena or stimulate economic activity; raising taxes to reduce certain consumption or activities;
- financing certain activities for the creation of new jobs, retraining, and reorientation of the unemployed;
- contracting external loans by the state to supplement internal resources or guaranteed by State to loans contracted by private enterprises to achieve national interest objectives.

The involvement of the State in the economy is achieved by the adoption by the public authorities of regulations necessary for the proper functioning of the national economy: laws, government ordinances, government decisions, methodological norms, etc. in different fields of activity, such as social insurance, environmental protection, sanctioning unfair competition, etc.

Professor Hugh Dalton, in his paper "*Principles of Public Finance*", identifies four main directions in the study of public finance, namely (Figure 1):

Figure 1. The scope of public finance

Source: own editing after the 4 main directions in Dalton, H. (1923), *Principle of Public Finance*, The Economic Journal, Volume 33, Issue 129, 1 March 1923, Pages 94–95

2.1. The study of public revenues - involves comprehending how governments manage to collect budget revenues, namely by classifying them as:

a) tax revenue - this means defined ways for central and local authorities to collect taxes and duties. The specialized literature in Romania addresses three main categories of government tax revenue, as they are recognized by the Fiscal Council of Romania, namely:

a1) VAT and excise duties;

a2) Direct taxes;

a3) Social security contributions.

b) non-tax income - these involve government activities to increase the profitability of budgetary activity, by lending capital to other countries, renting and revenue generated by government goods, donations from international organizations, etc.

The main criterion of distinction identified by the author is represented by the human factor, as it can contribute to the formation of budget revenues. The study itself involves research in the field of taxation, revenue classification, methods of increasing government revenue, etc. (Dalton, 1923).

Needless to say, when we're talking about establishing public revenues at the level of local authorities, we're talking about:

a) income of its own: taxes, fees, contributions, other payments, other income and allowances deducted from income tax;

b) amounts deducted from some income from the State budget;

c) subsidies received from the state budget and other budgets;

d) contributions and sponsorship

2.2. The study of public expenditures - involves an understanding of the spending of public money by central and local authorities. Primarily, they'll spend significant amounts on infrastructure, defense, education, health, etc., but also in general to increase the living standards of the population. The study involves classifying and understanding the objectives of public spending, the effects on budget allocations on different branches of the economy, unemployment, production, etc.

A significant benchmark in this regard is the classification used by UN bodies (methods adapted by Romania, since 1991) which is based on the concomitant use of two main criteria: functional and economic.

The functional classification of the UN includes public expenditures for public services, defense, education, health, social security, housing and communal services, culture, religion, sports, economic actions, and other purposes. (Cioponea, 2014)

The UN economic classification aims to group public spending into:
- Expenditures representing final consumption;
- Interest on public debt;
- Operating subsidies and other current transfers;
- Gross capital formation;
- Land acquisitions and intangible assets;
- Capital transfers.

2.3. The study of public debt - involves an understanding of the concept of public debt, more precisely the case where public expenditures exceed public revenues. The difference is borne by state loans from other people, entities, countries, or international organizations such as the World Bank. The study of public debt involves its management and, first, understanding of its effects on the economy, the burden it represents for a particular country.

The public debt law in Romania (no.273/2006) distinguishes public debt as:
- *governmental public debt* – being defined as the total amount of financial obligations internal and external of the State, at some point, coming from loans contracted directly or guaranteed by the Government, through the Ministry of Public Finance, on behalf of Romania, on the financial markets;
- *local public debt* - the totality of the internal and external financial obligations, of the local public administration authorities, at a given moment, coming from loans contracted directly or guaranteed by them on the financial markets;

2.4. The study of financial administration- this includes the preparation, transmission, and implementation of budget execution projects and the implementation of various government policies. The approach also includes the study of the impact of such policies, whether economic or social, as well as the intergovernmental relations arising from them, international relations, diplomacy, etc.

3. Functions of public finances

There are three main functions of the public finances (Khan, 2019):

3.1. Allocation – this function allows central and local authorities to invest in public goods that everyone can benefit from in various field such as: healthcare system, justice system, education, infrastructure etc.

3.2. Distribution – this function deals with social inequalities and the redistribution of public wealth (ex. progressive taxing, throughout which can be charged a higher tax percentage from the rich)

3.3. Stabilization – this function deals with policies referring to deficit budgeting during times of depressions or surplus budgeting during times of economic boom, in order to reduce the fluctuations that can impact the economy during a time o crisis.

4. The response of central and local authorities to the pandemic crisis

With most of the countries trying to battle the economic impact of the pandemic crisis we can adapt the general measures taken by each country in order to stabilize its economy and to avoid mass panic:

4.1. Regarding the public income: mostly all of the public taxes have been delayed from payment, whether we refer to VAT and excise duties, direct taxes or social security contributions. Instead most of the countries have resorted to their reserve founds or have taken loans from the IMF.

4.2. Regarding the public expenditure: many countries (Romania included) have made budget amendments, taking away founds from the defense, infrastructure projects or social, cultural. It is however not enough since:

- expenditures representing final consumption have grown;
- interest on public debt will be higher than ever;
- operating subsidies and other current transfers will be either delayed or not unpaid;
- gross capital formation will encounter difficulties;
- land acquisitions and intangible assets haven't got any clear value at the moment;
- capital transfers will need to continue to been paid

There is also a volatile new public expenditure in most countries as in unemployment benefits ranging from 80 %-85% in UK, to 75% in Romania, to somewhere between 50% and 100% in the US. (Campbell 2020)

4.3. Regarding public debt – as explained previously due to the increase of public expenditures we can expect a huge increase in the public debt of most of the countries trying to compensate the deficit budgeting. The international organizations such as the IMF, or the World Bank must carefully revise the request of countries so that we won`t have inflation.

4.4. Regarding the study of financial administration- in the current crisis there is a need to understand how exactly can governments implement policies that will allow economies to breathe, stop migration flows and won`t encourage unemployment.

In order to achieve stabilization in this time of both pandemic and financial crisis, countries must obtain stabilization by taking three immediate actions:

a) reallocating their resources from the extremely high defense expenditures towards crisis management programs and dealing with the pandemic crisis. Local authorities should also allocate their expenditures on social activities towards building local heath infrastructures to deal with the current crisis. The public expenditures should have three main objectives:

a1) increase the capacity of health systems to deal with the current crisis

a2) encourage businesses to continue their businesses as much as possible, without encouraging at the same time the increase of the unemployment rate, by giving away to easily unemployment benefits for both employees and employers;

a3) develop movement patterns so that people can leave their homes in order to safely travel to/and work

b) redistribution of wealth throughout progressive taxing for the rich

c) develop an action plan for stopping migrant flows from leaving/entering countries – even tough it might seem hard to realize since the receiving country cannot restrict a foreign citizen from leaving its border, and the country of origin cannot prohibit its citizens to return home, there needs to be a more restrictive process in doing it so; otherwise, these huge migrant flows moving from west to east, not only help spread the virus itself, but

create a burden for the home country in terms of both health system and social benefits, and leaves western European countries without labour force in certain areas.

5. Conclusions

Migrant flows are one of the main source of spreading the COVID-19 virus and are at the base of the economic crisis that is starting to show its signs. Public authorities should cooperate in order to both stop migrant flow for traveling and also should redesign their way of spending. In 2019 the world spend almost 2000 billions of dollars on Military Expenditures, while only a fraction of that was spend on medical research and development.

The COVID-19 pandemic crisis will have a major impact on the global economy, with some reports suggesting that China might suffer the most from an economic point at least. (Erken, 2020)

There is a need of medical equipment yet somehow countries instead of producing it fly over the world to buy it, sometimes even bidding against each other.

Humanity must once and for all stop auctioning for ventilators and start producing them, since this is the era of high-tech modern equipment, it is unimaginable that humans fail into producing basic medical equipment that was needed and produce a century ago, and in order to do that it must rearrange its priorities in terms of public spending.

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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON TODAY' S SOCIETY

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Abstract: *The evolution of Artificial Intelligence is closely linked to the evolution of technology. Thus, the increasing computing power of computers, their ability to perform more and more complex tasks, the access to very large volumes of data, the use of graphical processing units, are some of the elements that have contributed to the development of Artificial Intelligence, which has nowadays an active role in our daily lives. This paper aims to present the impact that the adoption of Artificial Intelligence has on the economic environment, through an analysis of some fields of activity together with a series of processes corresponding to each field.*

Keywords*: Artificial Intelligence, Machine Learning, Deep Learning, Economics.*
JEL classification: *D83, D89.*

1. Introduction

Due to the evolution of today's world, to new computing technologies and the multitude of fields of use, concepts such as Machine Learning, Deep Learning, Artificial Intelligence (AI) are increasingly common.

Although, sometimes in practice these terms are used as synonyms, they do not refer to the same things, between them there is an inclusion relationship visually represented by Fig.1.

Thus, Deep Learning is a subset of Machine Learning which is a subset of Artificial Intelligence.

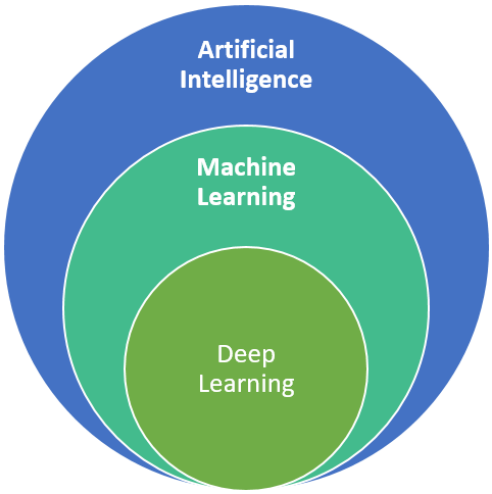

Fig.1. Link Artificial Intelligence -Machine Learning-Deep Learning

Source: Master Intelligence Economique et Strategies Competitives, 2018. *Artificial Intelligence, Machine Learning, and Deep Learning: Same context, Different concepts,* [online] Available at: <https://master-iesc-angers.com/artificial-intelligence-machine-learning-and-deep-learning-same-context-different-concepts/> [Accesed 22 March 2020].

The term Artificial Intelligence was first used in 1956 in the Dartmouth Summer Research Project on Artificial Intelligence workshop, considered the event that initiated Artificial Intelligence as a research discipline (Research Publications, 2006). The stated purpose of the workshop was that for 2 months, 10 scientists from various fields (mathematics, computer engineering, information theory, neural networks, natural language processing, etc.) to study how aspects of learning or any other characteristic of intelligence, can, in principle, be described so precisely that a machine can be created to simulate them, thus solving problems previously reserved for humans (McCarthy et al., 1955).

The American scientist John McCarthy, one of the initiators of the 1956 project, in the article "What is Artificial Intelligence" (McCarthy, 2007) referred to Artificial Intelligence as "the science and engineering of making intelligent machines, especially intelligent computer programs."

With a multitude of definitions, Artificial Intelligence refers to a branch of computer science that deals with the simulation of intelligent behavior in computers (Merriam Webster Dictionary, 2020), representing the ability of a computer or computer-controlled robot to perform tasks commonly associated with intelligent beings (Britannica, 2020).

In 1959, the American Arthur Samuel, considered a pioneer in the field of computer games, first used the term Machine Learning and demonstrated that machines can learn from previous mistakes (History of Information, 2020), stating that "programming computers to learn from experience should ultimately eliminate the need for a multitude of detailed programming efforts" (Samuel, 1959).

The objective of Machine Learning is to develop algorithms that allow patterns based on training data sets to be identified and then scenarios to be made or predictions to be generated as accurate as possible for future events.

Therefore, programs developed based on Machine Learning improve their performance in accomplishing a certain task through learning (training) and experience gained by comparing the results obtained with the desired results.

Deep Learning requires a complex architecture that mimics the neural networks of the human brain (SIVECO Romania, 2018) and represents a category of Machine Learning algorithms that use artificial neural networks in processing very large sets of input data, pattern recognition and data classification to draw correct conclusions without the help of people.

In fact, the main difference between Machine Learning and Deep Learning is that Machine Learning models are progressively improving based on data that needs to be structured / labeled and require the supervision and intervention of a programmer when the prediction is inaccurate, while in Deep Learning the data do not have to be structured / labeled, learning is from one's own mistakes, unsupervised and implicitly much faster.

2. Artificial Intelligence and the economic environment

McKinsey & Company, one of the largest strategic management consulting firms in the world, conducted an online survey on Artificial Intelligence in 2019 with the participation of 2360 members of the McKinsey.com online group, employees from all levels of management in various industries, from 115 countries.

A percentage of 58% of the respondents stated that in the companies they belong to, Artificial Intelligence was adopted in at least one function or business unit, the increase being 11% compared to 2018. In Europe, the increase is from 51% (2018) to 58% (2019) (Artificial Intelligence Index, 2019).

The fields of activity together with a series of processes corresponding to each field in which Artificial Intelligence is used are presented in Table no. 1 and Table no. 2.

Table no.1. Areas of activity and processes in which Artificial Intelligence is used
(% respondents)

Areas of activity	Service operations (e.g. customer care, back office)		Product and / or service development		Marketing and sales		Manufacturing	
	2018	2019	2018	2019	2018	2019	2018	2019
Automotive	27	26	39	43	15	13	49	53
Professional services	38	36	34	31	36	29	11	10
Electric Power & natural gas	46	49	41	42	15	17	19	21
Financial services	49	55	26	25	33	43	6	2
Healthcare	46	50	28	31	17	19	9	10
High tech	48	49	59	55	34	37	20	12
Pharma	31	19	31	41	27	16	28	41
Retail	23	47	13	33	52	36	7	14
Telecom	75	74	45	48	38	28	22	21
Travel & logistics	51	52	34	20	32	17	4	7

Source: Made by the authors based on data available at
Artificial Intelligence Index, 2019. *Annual report.* [pdf] Available at: <https://hai.stanford.edu/sites/g/files/sbiybj10986/f/ai_index_2019_report.pdf> [Accesed 25 March 2020].
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Table no.2. Areas of activity and processes in which Artificial Intelligence is used
(% respondents)

Areas of activity	Supply chain management		Risk		Human resources	
	2018	2019	2018	2019	2018	2019
Automotive	11	18	2	9	8	4
Professional services	19	17	15	12	16	18
Electric Power & natural gas	14	19	14	12	15	17
Financial services	7	12	40	42	9	10
Healthcare	21	12	19	10	18	10
High tech	23	14	17	14	21	20
Pharma	13	11	3	3	6	6
Retail	38	34	9	14	8	4
Telecom	26	27	23	30	17	22
Travel & logistics	18	31	4	5	2	10

Source: Made by the authors based on data available at
Artificial Intelligence Index, 2019. *Annual report.* [pdf] Available at: <https://hai.stanford.edu/sites/g/files/sbiybj10986/f/ai_index_2019_report.pdf> [Accesed 25 March 2020].
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As can be seen, companies are choosing to implement Artificial Intelligence to a greater extent in the processes that lead to increased company revenues.

Thus, in the automotive field, Artificial Intelligence was used mainly in the manufacturing process (53%) in 2019, followed by the development of products / services (43%) in 2019, both registering an increase of 4% compared to 2018.

Collaborative robots used to automate assembly lines take over repetitive, tedious tasks, thus reducing production time. Being part of the team, together with people, it contributes to the creation of an intelligent production environment. In painting and welding operations, Artificial Intelligence allows robots to identify material irregularities and alert the personnel responsible for quality control.

For transporting different types of materials from the warehouse to the production lines, inside the factories, etc. automatically guided vehicles are used.

In the case of cars, Artificial Intelligence, by monitoring dozens of sensors, can identify dangerous situations, warn drivers or take control of the vehicle to avoid accidents (Eisenberg, 2018).

In the automotive industry, Artificial Intelligence makes it possible: autonomous driving, predictive maintenance (detecting problems before they affect vehicle operation), connecting vehicles, driving monitoring (which includes a driver monitoring system that provides real-time presence information and driver status).

Among the areas analyzed, the use of Artificial Intelligence in the process of developing products and / or services appears in the first place, in 2019, in the field of Hight Tech (55%), followed by telecommunications (48%). Compared to 2018, for this process, the Hight Tech field registered a decrease of 4%, while in telecommunications there was an increase of 3%.

The upward trend in investments of communications service providers in product / service development is explained by the continuous concern for innovation, investments being focused on optimizing network quality, preventive maintenance, virtual assistants for customer support and automation of processes through robotics (Churchill, 2020).

According to the results of a worldwide study in which 1872 respondents from the fields of activity present in Table no.1 participated, in the period 2020-2023, by adopting Artificial Intelligence technologies, the fields in which the largest reductions in labor force will be registered are cars and telecommunications (Statista, 2020).

Thus, among the respondents in the automotive field, 18% estimate that the adoption of Artificial Intelligence will lead to a decrease of over 10% of the workforce in their companies and 28% of respondents estimate that the decrease will be between 3% - 10%. In the field of telecommunications, 18% of respondents estimate that the decrease in labor force will be greater than 10% in their companies and 37% of respondents estimate that the decrease will be in the range of 3% -10%.

On the other hand, the High tech field will register an increase in labor force by at least 10%, according to the estimates of 15% of respondents.

In the field of financial services, 42% of the use of Artificial Intelligence is found in the risk management process, for the prevention, identification and eradication of fraud, the increase being 2% in 2019 compared to 2018.

In tourism, Artificial Intelligence is used to provide online support to customers, to collect and interpret data in order to obtain conclusions about customers, business practices and pricing strategies (Revfine.com**,** 2020), based on customer browsing behavior can be offer personalized recommendations on new travel destinations, accommodation options, transportation, all of which help to improve travel experiences.

The highest increase recorded in 2019 compared to 2018 in terms of the adoption of Artificial Intelligence is found in the processes of service operations (24%) and development of products and / or services (20%) in the field of Retail. By analyzing a large volume of data, Machine Learning and Deep Learning technology can identify patterns in

customers' purchasing preferences, retailers can thus meet the wishes of consumers with personalized offers, which will lead to increased sales.

With the help of Artificial Intelligence, augmented reality, it will be possible to create virtual test booths, shopping assistance will be robotic, the use of smart mirrors (also called digital mirrors) will allow consumers to try, virtually, as many items of clothing they want without need a test booth. Chatbots, those computer programs designed to simulate a conversation with human users, through text or voice interactions (Search Customer Experience, 2020), have also begun to be used by small business owners to provide immediate customer support 24 / 7, to answer their questions and help them navigate through various options to quickly find the products they want. The way customers receive personalized, fast attention, results in their loyalty.

It is expected that by 2030, capitalizing on the power of Artificial Intelligence, its Machine Learning, Deep Learning subdomains by companies, will lead to an increase in global gross domestic product of up to 14%, the equivalent of $ 15.7 trillion. This increase in global GDP is estimated to be driven by up to 55% of labor productivity growth in 2017-2030 (PricewaterhouseCoopers, 2020).

The highest economic benefits from the adoption of Artificial Intelligence are expected to be achieved by China (with a 26.1% increase in GDP by 2030), followed by North America (14.5% GDP growth) and Southern Europe (11.5% GDP growth) (PricewaterhouseCoopers, 2020).

3. Conclusions

The adoption of Artificial Intelligence will lead to an increase in the quality of the products offered, to more qualified, more personalized services, to a better organization of time and implicitly to the increase of productivity. Also, by changing the decision-making process of purchasing and consumption, there will be increases in consumer demand.

For companies that adopt technology efficiently, Artificial Intelligence brings cost savings, improving efficiency and increasing competitive advantage.

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MODELLING ICT SOLUTIONS FOR THE DIGITAL TRANSFORMATION OF EDUCATION

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Abstract: *In the current economy it is difficult to identify an organization that does not use any ICT system in its daily work. Our study focuses on the implementation of a project of solution applicable in education. Regardless of the scope, education or business, the development and implementation of information systems aims at organisational transformation involving the introduction of new processes and the elimination/modification of existing processes in the organization. In the process of shaping an ICT solution, it is essential to identify the requirements of this solution that meets the needs of users, i.e. prior to modelling, it is necessary to know as thoroughly as possible the users and the processes in which they are invoked because the modelling of ICT solutions involves the identification, simulation and testing of processes regarding human-application-human. In the process of digital transformation of education as well as in other digital transformation processes, at some point the problem of reskilling users/stakeholders is attained. In this phase, discrepancies often arise between categories of users who understand and accept the transformation process and those who do not understand or do not want to make extra effort to understand and accept the processes in which they are involved.*

Keywords: *E-Learning Management System, ICT modelling, Digital Transformation.*
JEL classification: *I21, M15, O33.*

1. Introduction

The content of this study comes from the authors' recent experience of implementing an E-learning system that includes three main parts: User Experience Design – UX, User Interface Design – UI and a part more related to human behavior Users Training process.

All these parts are necessary in every ICT solution implementation and the modelling of this stages are the main task of project team. The aim of this article is to show few practical steps that project team followed during implementation of an ICT solution for E-learning to serve as model for those who meets this kind of challenges.

The leading objectives of our practical oriented study are to implement a feasible solution in a short period of time based on a agile project management approach and to emphasize the importance of modeling scenarios using the most recent modeling technologies in order to achieve the best user experiences.

In order to successful implementation, project team involved tools and practices used in developing of software applications and used an agile management approach and knowledge sharing methods.

2. Background and Context

Nowadays, the importance of technology applied in education are more and more visible. The potential of technology-enhanced learning nurtures the potential for more substantial transformation (Flavin, 2017), this usually make a big difference in the adaptability of education organizations to changes surrounds it.

Regarding our study, to understand the advantages and contribution of modelling process regarding implementing ICT solution, first we must clarify what steps and elements include it. The ICT system modelling process can be link with business process modelling because in both cases implies actors, processes and flows, variables etc. A

business process modeling application requires the ability to design, run, manage and monitor processes that incorporate interactions between the system and humans (Havey, 2005). Also, these elements are available for ICT system modelling process. However, this modeling effort begins with identifying the concepts to be represented (Weske, 2007).

The model of an ICT solution usually reflects a deep understanding of the whole project and this is possible by involving different categories of developers. Phases needed to be achieved by them are:

1. Identifying and understanding of user's needs, what are their possibilities and level of digital skills related to solution developed.
2. Identifying the main functionalities of the ICT solution which respond to users' needs detected in first phase and are realistic from developers' point of view.
3. Developing a user-friendly design and methodology (alternative use cases can help);
4. Provide training for users if needed, to ensure fluent using of all facilities which offer the ICT solution.

So, beside of each of this step regularly is a high skilled expert which can apply agile work style and specific methods and tools.

Developers of advanced ICT and graphics systems, 3-D printing tools, or consumer products recognize that their success depends on the construction of effective user interfaces-UI and the creation of appealing user experiences – UX (Shneidennan and et al., 2017). Regarding UX modelling, it can include two phases mentioned above: 1st could be represented by UX Research-UXR and 2nd phase by UX Design – UXD (Stull, 2018).

What a good UX means? (Stull, 2018)

- Effective UX design and research saves time and money
- The conflict between what we sense and what we perceive lies at the core of user experience.
- Effective UX anticipates events a user may encounter and is more than a summation of features.
- UX translates business, marketing, and technology solutions into meaningful experiences for users.
- Effective UX fulfills users' needs and serves them.
- Storytelling and UX share similar inductive and deductive arrangements.
- Early UX activities, such as research, are often intangible to novices
- UX is in a constant state of change.
- The potential for both good and bad UX is built into every product, service, function, interaction, and piece of content.

While a UX model reflects back-end flow of the system and responds to the main problem of the users through functionalities of ICT system developed, UI model represent the specific wishes of the users-developers, how responsive is the content and aims to deliver a user friendly solutions to them. Usually, User Interface model is defined by three ingredients (MacDonald, 2019):

• A named solution describing what the pattern does – how easy users understand and use the ICT Solution/Idea developed?

• The problem the user is facing or why this pattern is needed – how well/efficient solution solves the user's problem?

• The context for when to use the pattern – if users reached maturity to use the solution?

As we see, UX and UI model are very close to each other and combine similar elements in both cases and an ICT solution can`t be developed by one of this. Here comes

another big task, communication between project team: UX designer, UI designer, project manager and for sure involving of users (in research phase and feedback collection phase).

One of the software tools used in implementation process design was Scene2Model application. The application provides users with a digital design environment that addresses relevant aspects of design thinking that companies can download for free and use to experiment with their innovative ideas, for example by linking them to business processes or other company-specific elements. (DIGITRANS PROJECT, 2019b) Scene2Model provides a process for transforming tangible figures into digital models / diagrams, with the possibility of simultaneous semantic enrichment with new objects for modeling (Miron *et al.*, 2018).

Regarding training and support of the users, project team took in account many forms of knowledge transfer to and between users. As in the case of many other ICT solutions, knowledge transfer methods must be as close as possible to user's familiarity and understanding. This is the main argument, why the project team decided to create video tutorials with verbal explanations and digital documents with instructions and print-screens. Nowadays, disseminating knowledge in general are shaped by the interaction of three factors: resources including technology, the nature of knowledge, and the method for managing it (Moodie, 2016).

3. Research Results

Our case study reflects UX design and UI design regarding implementation of E-learning system in University and additional phases regarding these two main steps. As we mentioned before, each of this element include a research component. First, any organization that intend to implement an ICT solution must ensure that have capacity from human, financial and technical perspective. In our case, all these conditions were ensured, and implementation process begins. ICT infrastructure was supported by existed database of users.

As was mentioned above, project team member used Secene2Model application which offers large possibilities in modelling of business and ICT processes. This tool includes characters (actors), ICT equipment, different backgrounds, furniture, processes and types of relations between elements. Annex 1 represent the application interface with modelling elements.

In figure 1. below is represented the process of updating organizational ICT infrastructure and how it was adapted for E-learning system. First, we have to argue that existing database of users was very helpful and moved a step further project team in preparing infrastructure.

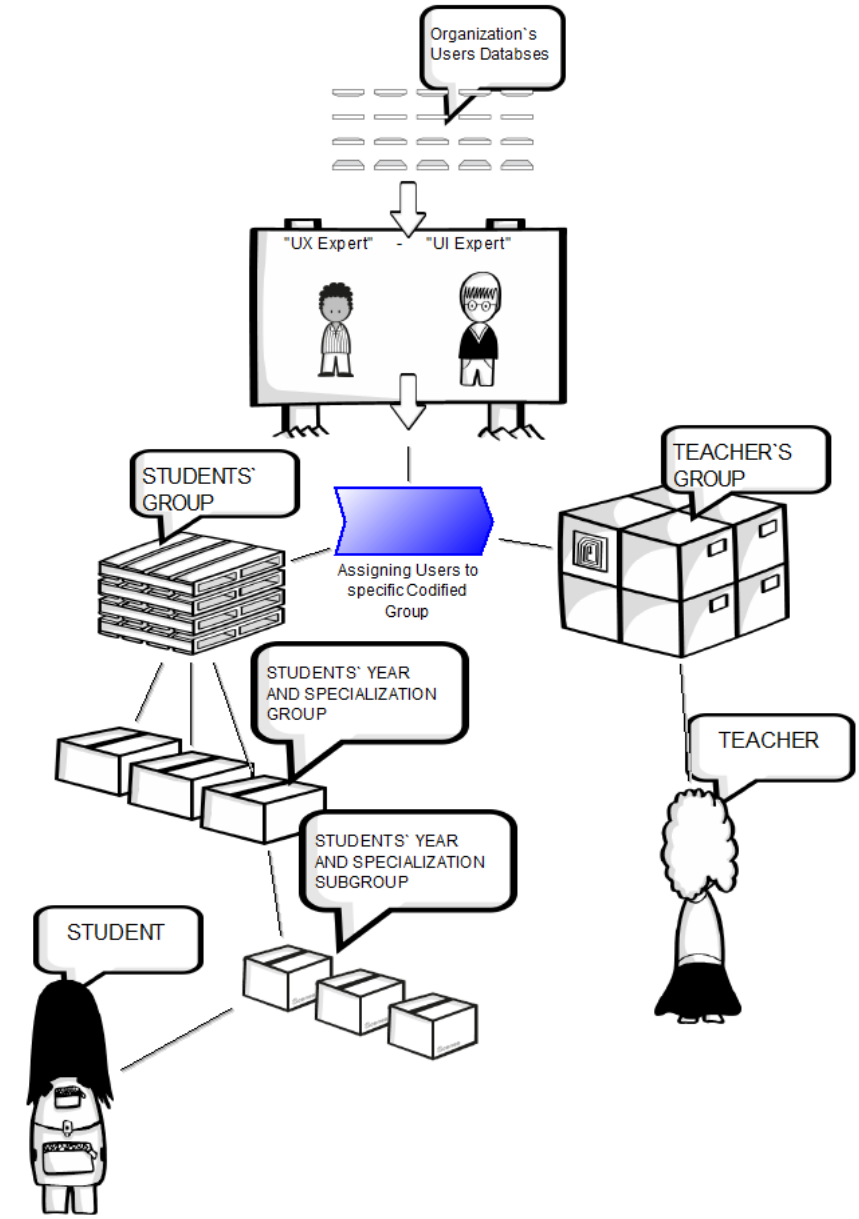

Figure 1. Organization`s ICT infrastructure Update

As we see in the figure 1. UX and UI experts which are also the IT admins of organization, divided users in two main groups, teachers with full access and rights and, students with limited rights to E-learning system. Students was assigned to a specific codified groups and subgroups which ensured an easy way to add them to classes by *specialization/admission year/Group or Subgroup*. This way of codification helped teachers and admins to manage databases and processes related to learning activities.

In Figure 2. we represented an overview of the whole process of implementation of ICT solution. This process was divided in two phases, first include research on users needs and their competences and UX design to ensure a deep understanding of what they expect and what are they able to do to support this process. Second phase included UI design and training, support and feedback from users.

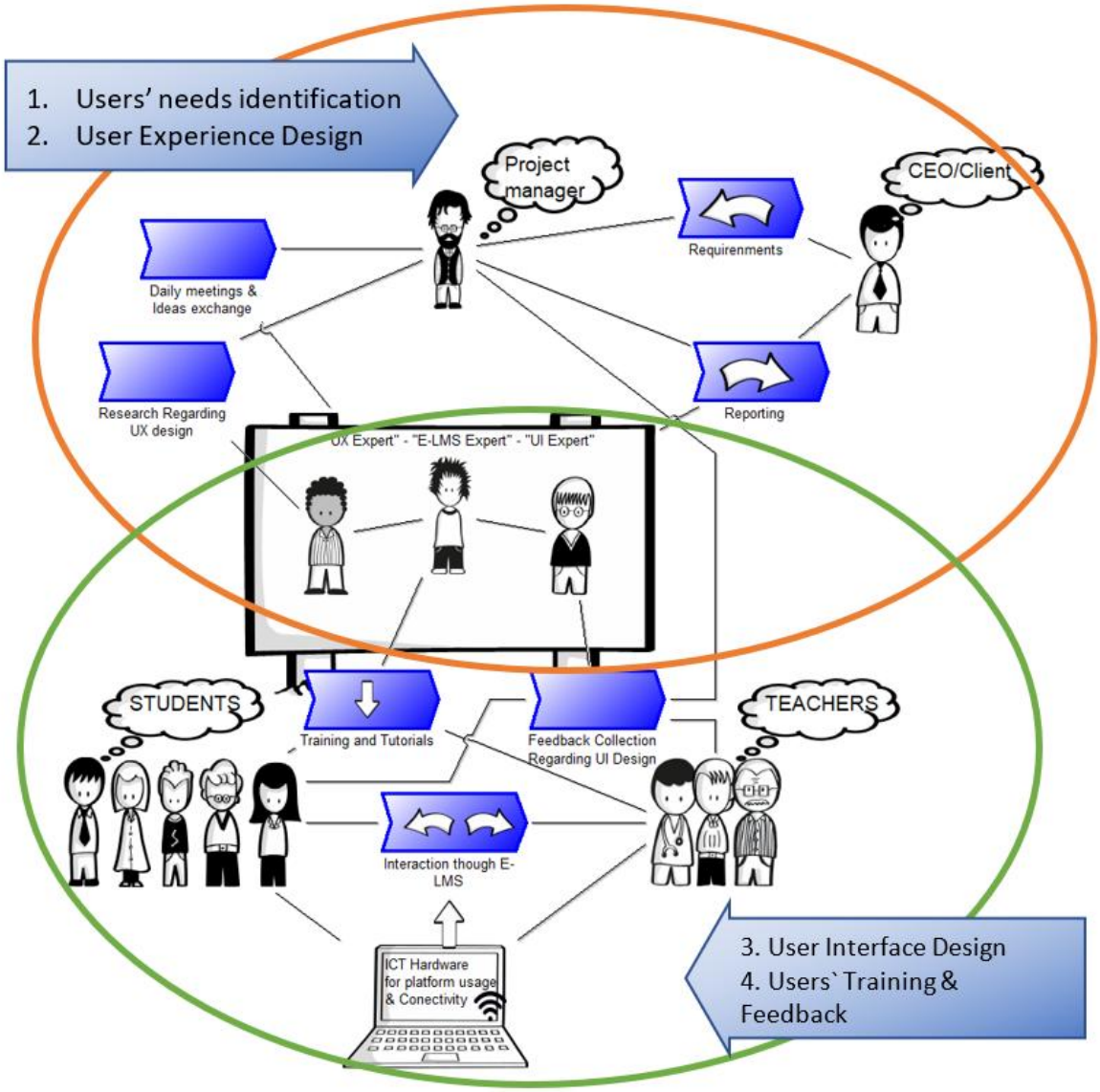

Figure 2. Overview of E-learning platform implementation

In a detailed approach, this figure represents following activities what lead the project team to a successful implementation of ICT solution for digital transformation of education:

1. Users' needs identification – this task was done by project team with methods as *Persona* and *Customer Journey* (DIGITRANS project, 2019a). This helped project team to identify what categories of users are in organization, how well they are prepared for digital transformation. Identifying needs by this method helped project team to anticipate users' behaviour during implementation process.
2. User experience design – using analyses from first step was developed main functionalities and flows which solve needs of users as teachers and students regarding E-learning platform.
3. User Interface design - at this stage the standard E-LMS was personalize for users from organizations, this includes: own terms and polices, adding Logo of institution in header of the platform and backgrounds used in online conferences, personalized tutorials and other training materials with watermark of organization, personalized templates for teachers to create learning materials for students.

4. Users` Training & Feedback – this was the most intense part because the system was implemented in the multidisciplinary organization. Training and tutorials must be adapted to all fields of study and consider at least the most important exceptions. This activity must continue long time after the implementation is done, therefore we would like to add more details regarding this process.

The project team used the ICT solution as a collaborative platform and for users' training. In other words, it was organizational collaborative learning platform which offer the following possibilities (Tatnall, Osorio and Visscher, 2005):

- Technologically mediated dialogue channel
- Shared workplace for a group
- Personal workplace
- Learning materials/ learning tools
- Analyzing tools of data/information
- Repository/memory for data/information
- Reference channel for the collaborative repository
- Modeling tools for monitoring the process

In the figure 3. below we represented the cycle of knowledge creation process regarding implementation of ICT solution. In this stage we include as main actor the E-LMS expert because he played the most important role in this process. Usually this process starting with Socialization represented in the figure, but we would like to start with Internalization phase of knowledge creation process.

- The **internalization** process is the moment when E-LMS expert gets in touch for the first time with this kind of platform and transform explicit knowledge provided by developers into tacit knowledge by experiencing and discovering step by step the platform`s possibilities applied in his own workplace.
- The **socialization** process begins when E-LMS expert involves his colleague to the working methods discovered, in this case, they are applying *learning by doing* principles and tacit knowledge of one person becomes tacit knowledge of his workmate.

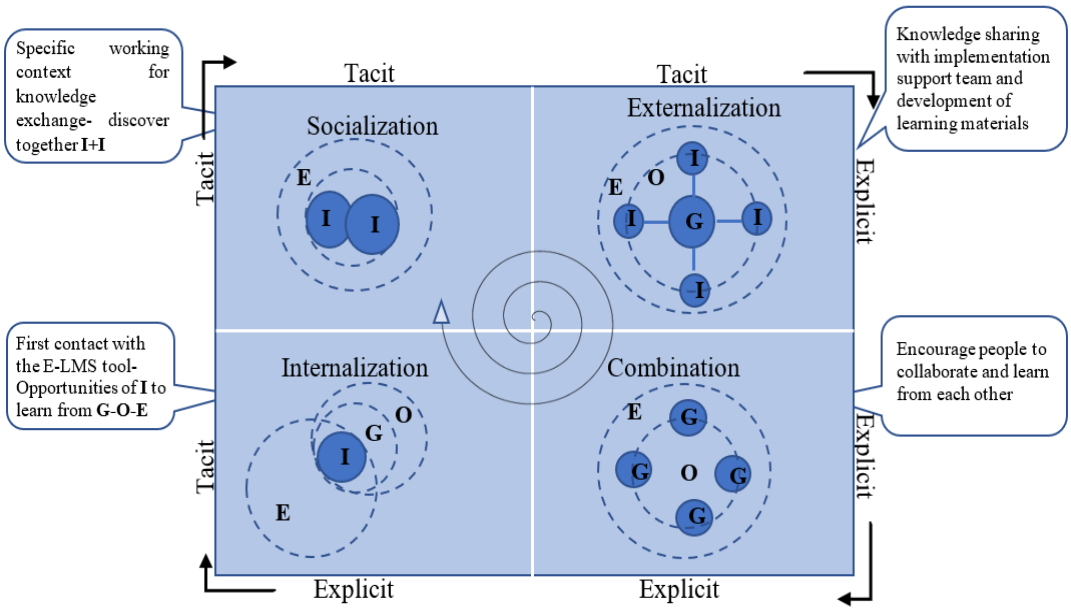

Figure 3. Knowledge creation and users training process explained by SECI Model

Source: Adapted from (Nonaka et al., 2008, p. 19)

- The **Externalization** process started after project team was created which consist of project manager, UX and UI experts and E-LMS expert. In this phase team members putted together their knowledge (tacit and explicit) and experience to deliver training materials for users. As we mentioned above, to cover all users' learning need, project team decided to produce video tutorials explained by experts, digital documents with screenshots and common training sessions.
- **The Combination** process started when was created an online group with users which serves as a knowledge exchange platform. In this way was discovered and solved many issues from users and implementation team perspective. Users started to collaborate with each other and discover together the best functionalities of the platform which solve their problem. From this point could start another cycle of knowledge creating process in organization.

The implementation of an E-learning platform, from an organizational point of view, is resources consuming process: human, financial, or time resources. Like any investment, this could bring profit or loss. Good planning and modeling of processes could help to avoid failure and bring a huge advantage to the organization.

3.1. Risks

As any transformation process, even digital transformation, presume organizational or/and human behavior change, the challenge of this step was high level of tacit knowledge involved in the process. Teachers, as a category of users, are high skilled in their domains of activity which makes them to own high level of tacit knowledge which a very difficult to change and replace. This could category of knowledge usually manifested in the way you teach (learning methods you are an expert), personal relationship with students, the way you organize yourself, etc. Rejection of changes (in our case the E-learning platform implementation), comes from very high skilled users which did not accept the transformation and did not put effort to change/adapt a part of their tacit knowledge.

4. Conclusions

An inadequate usage of E-learning platform implemented could make users' daily work more difficult than it was before implementation. Is more important to do the right things in the right way at the beginning, therefore usually developers phasing the processes, on one hand, implementation process, and on other hand users` training process and support.

UX and UI models could be continuously improved, as users' needs and wishes will change by the whole implementation process. In this context, we prove that UX and UI model is built into every product, service, function, the interaction of user-system-user, and every piece of content that users can view and interact.

To ensure continuous improvement of UX and UI model, project team must apply an agile management approach because they had limited time for implementation, limited users' competences, many exception to which platform have to respond, requirements for project team to measure the progress and ensure sustainable development of E-learning solution. The platform implemented was very helpful in users' training and support. SECI model helped project team to structure the knowledge creation and knowledge sharing process through whole organization. This facilitated learning through collaboration and gave users a chance to discover functions by themselves which ensured better adaptation to each field of study (each exception required from users).

Our study is a part of a broader research approach that we intend to continue and to develop case studies scenarios in a comprehensive manner giving us the possibility to map the processes from the ICT knowledge management perspective.

Annex 1. Scene2Model application interface with modelling elements

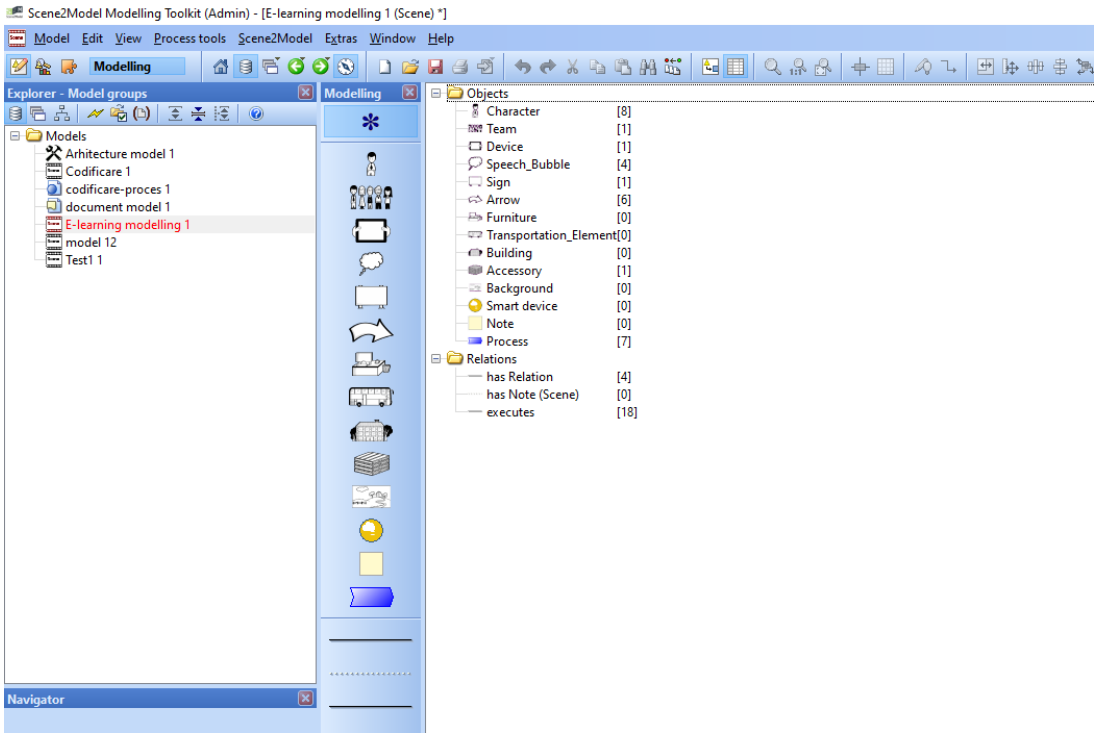

Image 1. Scene2Model application - general overview

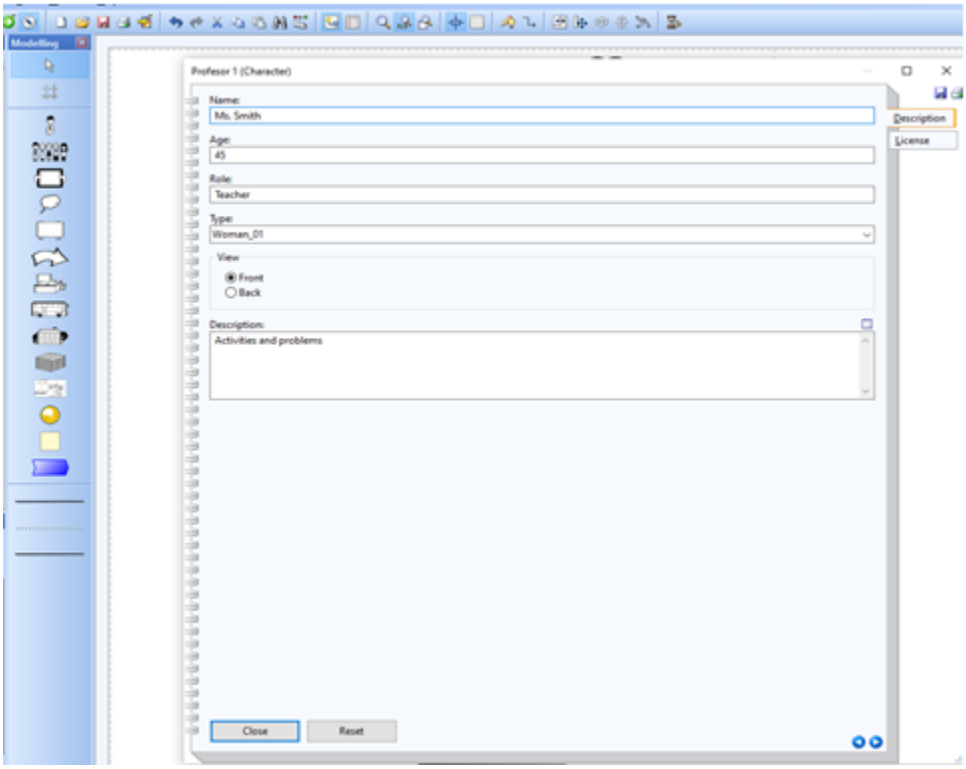

Image 2. Scene2Model application - character overview

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MODELING SYSTEMS FOR SOCIO-PROFESSIONAL INSERTION PRODUCTIVE LABOR MARKET

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Abstract: *In recent years, it found that universities attach great importance to participation in projects relating to the insertion of graduates in the labor market, both as coordinator and partner institution allocating significant human and material resources for the successful development of these projects. In this respect, the analysis carried out we started to focus on one of the problems in Romania, namely, that today, few graduates fail to integrate rapidly into the labor market. In fact, it is known that the labor market is the relationship between young graduate and employing companies. However, job security, one of the important conditions for graduates is endangered by the current economic crisis. Job loss is one of their main concerns given that supply is more limited than at the time of their enrollment in the labor market. Also, high rates of unemployment indicate their main difficulties that they experience in graduation-work transition. Better education and access to education for gaining greater stability in the labor market would allow natural insertion in the labor market. Also, high rates of unemployment indicate their main difficulties that they experience in graduation-work transition. In recent years, many young people graduate from university increased significantly in recent years. Of course we can not isolate statistical data quality workforce, amid the transformation of higher education in mass education, which often hide masked youth unemployment by delaying the integration into the labor market and further studies. However, this statement regarding the level of education required for a post became widespread labor market in Romania, in the sense that, even for jobs that would normally be performed by persons with secondary education is required diploma University studies. Also, in recent years we have witnessed an excess of demand for jobs in relation to the supply of the market. The current economic situation and the situation on the labor market leads university graduates to settle for work that you have, even if it does not meet their expectations.*

Key-words*: model, socio-professional insertion productive, education, skills, training.*
JEL Classification*: A, A2, A23*.

1. Introduction

Higher education creates prerequisites for increasing the share of active population with higher education is an important strategic objective for a more competitive labor market in Romania and the Romanian economy in general.

Labor market flexibility plays an important role in the absorption of newcomers. This shows the ability of the labor market to respond to changes occurring in the economic and social environment. In recent years, this has been at the center of attention with regard to better adapt to the new change. This implies a certain structure of the education system.

2. The actuality of research

News approached theme is revealed by an analysis of the insertion of graduates on the labor market, important in the current economic analysis who knows fluctuations in unemployment, both in general and among them. Also, the fact that in recent years there has been a significant reduction in the degree of entering the labor market for graduates trained in the universities of South Muntenia, made us turn to the labor market, analyzing the capacity of education university linked to employers' expectations.

3. Obiectives

The objectives of the research were:
O1: analysis of labor market development scenarios of the last ten years, the current situation; O2: better advice on labor market insertion of young people eager to find a job in the field of specialization.

4. Material and methods

The research methodology used in elaborating scientific achievement is evidenced by the following:

- The proposal aims in research;
- Making a plan of analysis;
- Analysis and interpretation of data;
- Correlation performed using the proposed model.

5. Experimental results

The aim of this experiment is to identify possible correlation between the national insertion degree and the other statistical relevant market indicators. Some data mining techniques are used to discover possible relations among these indicators.

The goal of data mining techniques is to extract patterns and knowledge from large amount of data. The patterns may include dependencies (the evolution of some parameters may be direct or indirect related), generating groups of data records or identifying unusual records. Furthermore, these results may be used by a decision support system in order to obtain more accurate prediction.

Decision trees are one of the most commonly used data mining method. The goal of a decision tree is to predict the target variable values based on the evolution of some input field. Each interior node represents an input variable and each leaf is a possible target value. The decision tree can be read as an IF-THEN rule. The general form is *if condition then decision*, where condition contains the independent variables possible values and the condition represents a dependent variable classification.

In this study there are designed four decision tree models in order to discover possible relationship among the national insertion degree and other market indicators.

6. Results and discussions

In this experiment, there were built four decision tree based models to classify and possible predict the value for the national insertion degree based on other market parameters recorded values. In this analysis are synthetized all the input variables (selected from this data set) used by the models. There are no variables to be considered important by all four models; every model using a different algorithm selected different inputs. Three variables are taken into consideration by two models: the year (anul), the higher education young population rate (proportion of young people with higher education) and higher education population unemployment rate (unemployment rate of young people with higher education). Other inputs presented in Table 1 are selected only by a single algorithm.

All four models were compared using three statistical parameters: correlation coefficient, Mean Absolute Error (MAE), and Root Mean Square Error (RMSE) and the time taken to build model. The correlation coefficient reflects possible relationship among the variables. It has values between -1 and 1 (the closer to 1 or -1 the stronger is the correlation among the fields). MAE and RMSE measure the classification error (distance between the actual and the model predicted values); their values must tend to 0.

A decision table in Weka is a class for building and using a simple decision table majority classifier. Each decision corresponds to a variable, relation or predicate whose possible values are listed among the condition alternatives.

Table no.1. The Decision table

Rule number	Proportion of young people with higher education	Degree of insertion nation value
1	(11.02-inf)	0.545
2	(10.64-11.02]	0.567
3	(9.88-10.26]	0.578
4	(8.74-9.12]	0.586
5	(8.36-8.74]	0.588
6	(-inf-7.98]	0.589

Therefore, Table 1 can be read as follows. If the higher education young population rate is higher than 13.02 than the national insertion degree is 0.545; if higher education young population rate is between 10.64 and 11.02 than the target variable is 0.567 etc.

In this experiment, there were built four decision tree based models to classify and possible predict the value for the national insertion degree based on other market parameters recorded values.

In the research paper, we turned to employment at national and regional level which, statistically, can be analyzed in terms of indicators, considered as indispensable tools in the design, implementation and evaluation of education policies. We therefore insist on the ability to synthesize indicators relevant, reliable and comparable on a social system so complex as the education system.

A study on the labor market in Romania requires both knowledge processes, realities and trends across the country, and knowledge of phenomena manifested in this market over the years. The labor market in Romania is influenced by economic and social system of politics and the environment, so supply and demand on the labor market often have different tendencies, leading to a tense labor market

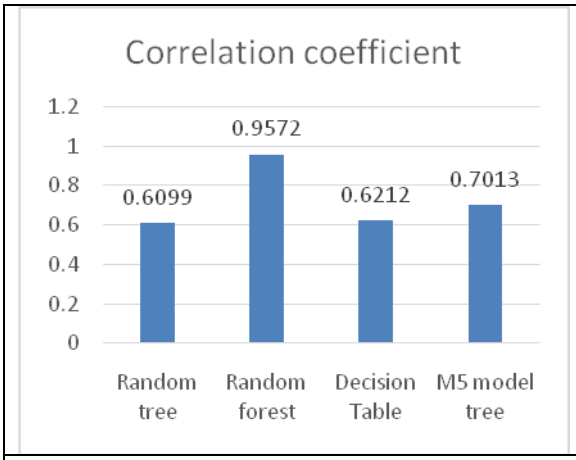
In recent years, the labor market has undergone a number of changes, so that both employees and employers have a new perspective regarding labor market insertion.

At present, the labor market is characterized by a high level of caution, both in terms of employers and employees.

Employers are increasingly careful in choosing suitable candidates, and offer jobs generally lower. Candidates will be increasingly more competitive, since it will increase specialization and selection criteria are becoming more numerous.

Also, after analyzing the labor market, it found that labor is not homogeneous, but differentiated on a broader or narrower range of occupations.

The subject brought into discussion is of national interest, interest that is served by developing this paper as: lack of a perfect transparency, labor is not perfectly informed, information about job vacancies and about working conditions is not readily available or free. Therefore, between the participation rate and the employment rate there is a perfect similarity. To increase the participation rate may witness a drop in the employment rate due to the rise in unemployment.



The graph 1.Corelaţia statistics parameter values that were based four methods /Analysis and interpretation of data; correlation performed using the proposed model.

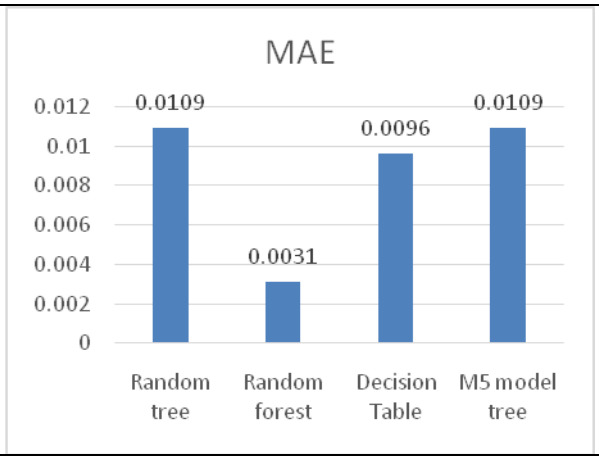


Figure 2. Results of the analysis MFA

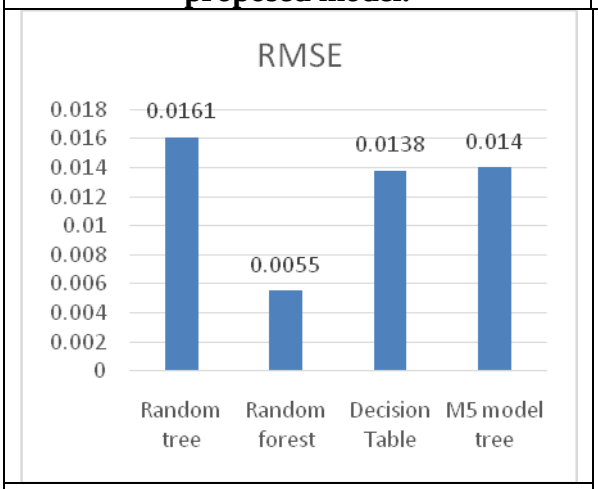


Figure 3. Results of the analysis RMSE

There can be sad that there is an universal data mining algorithm to predict the national insertion degree, because the computational intelligence techniques depend on the database used. Knowing the process of entering the labor market for young graduates, and features/determinants of this process became a priority both in the formulation of employment policies and of the education.

It is possible that in the expansion phase of the economic cycle or boom, amid increasing general prosperity, increase the attractiveness of the exercise of an activity remunerated, so that some of the legal working age, but withdrawn dintr- for some reason the labor market, willing to rejoin the active population category, increasing labor supply at a rate higher than the increase in employment. Equally possible is that new entrants or re-enter the no longer find work suitable to their preparation.

7. Conclusions

The research results will form a working tool which shows that appropriate measures to improve the current situation and recommendations to facilitate their integration into the labor market. The analysis made shows that offer jobs for young people is uncertain, largely as a result of changes in the school system, acceptance of people working in jobs below their training, birth rate, emigration, unemployment,

hardship increasing while maintaining and even revealing a pessimistic psychology. Labor required to be highly satisfactory and qualified to be flexible and efficient to be stable and fair. Increased labor mobility could improve the economic position of young graduates.

Authors'contributions. Made personal contribution to research is to analyze the relationship model of insertion of graduates in the labor market.

To start scientific research sources used for research were studies and research based on a rich bibliography of articles and papers (attached work), consulting Web site and databases Eurostat, National Statistics Institute (INS), the National Prognosis (CNP), Statistical Yearbook, Eurostat, the National Agency for Employment (NAE), documents from the universities of South-Muntenia and participation in scientific and professional dedicated analyzed domain.

Research limitations. Scientific research undertaken did not have a linear development, due to discrepancies between statistics.

Proposals and recommendations. I think it would be appropriate to rethink education policy, given the changes in the economic and social, so that there is a correlation between the requirements of labor market trends and types of training provided by the education system through training of graduates highly skilled necessary social and economic development.

Starting from the limits outlined above, one can realize that the analysis can be completed as appropriate the assumption of future directions, namely: enrichment research methodology and other methods in order to increase the objectivity of this research and expand the horizon research.

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