INTERNAL AUDITING & RISK MANAGEMENT

YEAR XIII, No. 4 (52), December 2018

ATHENÆUM UNIVERSITY

INTERNAL AUDITING & RISK MANAGEMENT

Revistă trimestrială editată de Universitatea „Athenaeum" & Centrul de Excelență în Managementul Financiar și Audit Intern

ANUL XIII, NR. 4 (52), DECEMBRIE 2018

Quarterly journal published by the „Athenaeum" University & Centre of Excellence in Financial Management and Internal Audit

YEAR XIII, No. 4 (52), DECEMBER 2018

Disclaimer: Facts and opinions published in Internal Auditing & Risk Management Journal express solely the opinions of the respective authors. Authors are responsible for the English translation of their text, their citing of sources and the accuracy of their references and bibliographies. The editors cannot be held responsible for any lacks or possible violations of third parties' rights.

EDITURA BREN
Str. Lucăceşti nr.12, sectorul 6 Bucureşti
Tel/Fax: 0318179384
www.editurabren.ro
e-mail: brenprod@gmail.com
ISSN 2065 – 8168 (print) **ISSN 2068 - 2077** (online)
Indexată în Bazele de date internaţionale
RePEc , CEEOL, SSRN, EBSCO, Google Scholar

INTERNAL AUDITING & RISK MANAGEMENT

Revistă trimestrială editată de Universitatea „Athenaeum" &
Centrul de Excelență în Managementul Financiar și Audit Intern
ANUL XIII, NR. 4 (52), 2018

CONTENTS

THE STRATEGY OF IMPROVING INFORMATIONAL SYSTEMS THROUGH ECONOMIC APPLICATIONS

Emilia VASILE, PhD Professor
Athenaeum University, Bucharest, Romania
rector@univath.ro

Dănuţ-Octavian SIMION, PhD Associate Professor
Athenaeum University, Bucharest, Romania
danut_so@yahoo.com

Abstract: *The paper presents the strategy of improving informational systems in economic applications. The architecture of the information system is the generic solution for the data processing processes of data integration and processing. The company's global IT system breaks down into subsystems, each of which covers a distinct field of activity. In turn, each subsystem breaks down into applications, each of which covers a distinct activity within the domain. In defining the architecture of the information system there are three strategies that have crystallized over time. The downward strategy: top-down goes from the principle of complex computer system decomposition to components with lower complexity, the upward strategy: bottom up promotes the initiative at every level of management (accounting, commercial, production, etc.) without a framework solution and a defined architecture for the global IT system at the organization level and the mixed strategythat is a combination of downward strategy with bottom-up strategy taking their strengths into account. The best stategy includes a mixed of the standard strategies and an important role plays the economic applications that includes algorithms that improve the business logic.*

Keywords: *business strategies, business environment, programing algorithms, information systems, business alternatives, business logic*
JEL Classification: *C23, C26, C38, C55, C81, C87*

1. Introduction

Management information systems are defined by two approaches:

a) starting from the information and its support;

b) starting from the function that the management information system has to accomplish.

In the first case, management information systems represent all the information used in the company, the means and procedures for identifying, collecting, storing and processing the information.

The second approach to defining management information systems starts from its purpose, namely to provide the information requested by the user in the desired and timely manner in order to substantiate the decisions.

Management Information Systems (MISs) imply the definition of: management domains, data, models, management rules.

The management domains correspond to each of the homogeneous activities carried out within the company - research, development, commercial, production, personnel, financial and accounting - taking into account the interactions between them. Moreover, the approach of these domains is done in a hierarchical vision leading to the identification of the following levels:

• Transaction in which elementary operations are performed;

• Operational where current operations are taking place, the decisions made at this level are current, of routine;

• Tactics corresponding to control activities and short-term decisions;

• Strategic feature of long-term decisions and / or global engagement.

Data is the „raw material" of any management system. All data reported and processed regardless of their nature, their formal or informal character, or the media on which they are located are taken into account (Schneidewind 2015; Lloyd 2016).

2. Management models and informatic systems

Management models summarize the domain's own procedures. We can exemplify through the model:

• Accountant, specific to the financial-accounting field;

• Manufacturing technology specific to the field of production;

• Sales specific to the commercial domain.

Management rules allow data processing and use of information in accordance with the objectives of the system.

Within a company with production and / or commercial activity, the following management rules can be identified:

- the supply is made when the stock actually falls below the standard stock;
- the material evaluation is carried out according to the FIFO method;
- a raw material is stored in one or more management;
- for second quality products the price is reduced by 5%, etc.

In the case of a bank, the following management rules can be specified for the current account information system:

- minimum balance;
- Payments are made within the balance limit;
- interest calculated for sight accounts is 11% per year;
- Up to two people with the right of signature can be registered.

Through the notion of domain, we come to the concept of a functional management subsystem based on functional criteria, on which the other two concepts are grafted: the management model and the management rules.

The management information system assures and provides the information requested by the user, using the IT tools, to substantiate the decisions regarding a certain area within the firm (Bakos 2016; Porter and Millar 1985).

Current IT systems are integrated systems. They are characterized by the application of the principle of the unique data entry and multiple processing in accordance with the specific information needs of each user.

Integrated accounting is characterized by a unique introduction of data taken from primary documents that update a single accountancy database that will then be exploited to ensure both the specific financial accounting and management accounting tasks, - thus, the processing requirements of all users.

There are some approaches in the development of information systems:

In the development of a computer system one can choose one of the following solutions:

- a centralized computer system
- a decentralized computer system

The centralized computer system is characterized by the fact that the whole process of data storage and processing, as well as the development of the system, takes place at a single location where there is a single computing

system, usually a mainframe, which stores a base unique data as well as all application programs. Users interact with the system via terminals (which act as thin clients).

The advantages of centralization are represented by:

- effective control over the use and development of software;
- control over data security and integrity;
- sharing hard, soft and data resources among users;
- eliminating the risk of hard and soft incompatibility within the system;
- Easily promote standards (technical, design, procedural, etc.) at the level of the whole system;
- providing the services requested by the users through the power of calculating the central system (mainframe).

Disadvantages of centralization are the following:

- the „fall" of the computing system blocks all users;
- Alteration of data and programs, whether void or accidental, affects all users;
- the system may prove slow and inflexible to users' needs, often insufficiently adapted to local or group needs of users;
- can achieve a long response time in case of simultaneous requests of multiple users. The decentralized information system is characterized by the fact that the data, software and power of

the calculations are dispersed in different locations (even geographically dispersed) of the organization. Processing takes place on independent personal computers or on local networks.

Advantages of decentralization:

- data is stored and processed locally;
- software is better suited to local needs;
- Hard, soft or database failures at a location do not affect other locations.
- the system configuration can be tailored to the needs of different departments within the organization or even local users;
- greater autonomy and motivation at the local user level.

Disadvantages of decentralization:

- high risks related to hard and soft incompatibilities between different locations;
- the inherent appearance of duplications of data and software in different locations;
- the difficulty of realizing complex projects at the local level;

- the risk of fragmentation of IT policy;
- higher costs than the centralized system.

The current trend is net-oriented towards decentralization, which must be done in such a way that:

• All responsibility and authority for the decentralized functions of SI to belong to local management;

• Ensure alignment with the standards used at the organization's overall SI level;

• at central level to be achieved:

- elaboration of strategy at the whole SI of the organization;
- communication management within the organization's local network;
- data management;
- disaster recovery.

Today, the architecture promoted in decentralized systems is the client-server architecture characterized by the fact that the applications and the data available to the users are dispersed on the different hardware depending on the number of users to access and the required computing power (Schneidewind 1987; O'Brien and Marakas 2015).

- Departmental applications that:

• running on the departmental server;
• exploits at department level data stored on its server;
• are shared by users of the same department;

- Organizational apps that:

• running on the central server;
• exploits data of general interest stored on the central server;
• are shared by users of multiple departments;
• requires high processing power.

3. Principles of design and implementation of management information systems

Conducting a rigorous and efficient design and implementation of management information systems requires the following principles to be observed:

1. The global approach to the problem solved;

2. Using a unitary methodology in the design and implementation of the information system;

3. Application of the most modern solutions and methods of designing and implementing the information system;

4. Structure of the IT system taking into account the organizational structure within the company.

5. Direct participation of the future beneficiary in the analysis, design and implementation of the information system.

Such participation ensures that the design specifications and the gradual validation of the solutions proposed by the designer are clearly formulated, all of which ensure a product that fully complies with the user's requirements;

6. Compliance with the legal framework. In the case of management information systems, it is mandatory to record, compute the indicators and prepare the synthesis work in accordance with the regulations in force.

7. Developing computer systems for the resources available to the user;

8. Since the software is subject to change, this change must be anticipated and controlled;

9. Compromises are inherent in software development and must be explicit and documented.

Specialty studies have attempted to highlight the success factors in running the software projects. The Standish report, for example, places as prime success factors:

- End user involvement
- Support of executive management
- Clarity of requirements
- Planning

Conceptual modeling of data

Entity-Association Model (EA)

To define the conceptual model of data, we use intermediate models that are used as a support for a design methodology. A conceptual model is a set of concepts and rules to combine these concepts, allowing the representation of the reality circumscribed to the field subject to computerization.

The models used are called semantic models and aim to provide the real world with the concepts offered. Semantic models use abstractions representing the real world as a collection of entities and relationships established between them. Most models allow the definition of restrictions describing the static, dynamic or even temporal aspects of entities.

The entity-association model (EA) that we will continue to use for defining the conceptual model of data is also a semantic model.

The EA model seeks to obtain a fair representation, using specific concepts, of the reality (the problem to be solved to be computerized). This representation of the real world will be achieved by abstaining from any restriction either computer or organizational. Starting from the semantics of real world objects and the relationships established between them, the EA model also serves as a means of communication between the modeler (computer) and the future user of the system (the beneficiary of the information system) describing the reality subjected to modeling according to his / her own perception.

The basic concepts of the Entity Association model:

Entity is an object of the modeled reality characterized by its own existence, with its own identity (which makes it identifiable with respect to the other objects of the same type) and a number of characteristics that express its properties. For example, we propose to you as a field of study the management of policies concluded by an insurance company.

In modeling, interest focuses on defining the types of entities belonging to the problem to be solved, and not on the entities representing the achievements of the types of entities. Instead of the entity-type notion, some authors use the class of entity concept. The abstract model that the EA model gives us is based precisely on these generic types of entities and the relationships established between them (Spence 1975; Porter and Millar 1985).

Type of entity is a generic concept designating the set of all entities presenting the same constructive characteristics. Examples: product, order, employee, student, contract, insurance policy, bank deposit, exchange order, etc. This time, the type of product entity designates all of the products in the company's catalog, described products based on the same common features: product code, name, unit of measurement, date of approval, percentage of VAT.

Attribute defines a distinct property of an entity. Each attribute has a range, that is, a set of admissible values. In an entity there are achievements corresponding to the defining characteristics of the entity type.

Attributes can be broken down by several criteria:

a) After complexity, the attributes are:

• Elementary (simple) whose achievements can not be broken down (example: monetary unit, unit price, student's student number, employee's mark, etc.).

• decomposable (complex) whose achievements are decomposable (eg: calendar date - can be broken down by day, month, year, address - can be broken down in the street, number, classification code of a fixed asset, etc).

b) After the achievements that the attributes can represent can be:

• mandatory (must necessarily represent an achievement that corresponds to the NOT NULL syntax - any realization) and • optional (are attributes that may not show any value within an entity (eg the attributes: telephone, fax, e-mail - not everyone has a phone, fax, e-mail address).

• monovalents: Attributes that represent a single value within an entity (example: student name, matrix number, date of birth, personal numeric code, etc.) and • multivaluers: attributes that represent multiple achievements within the same entity

The modeling problem is often very complex within it, identifying simple, composite and / or complex objects. In the EA model, the real world objects correspond to entities, and the entities defined by the same characteristics form a type of entity. This means that simple objects will correspond to one type of entity in the conceptual model of data.

Restrictions on integrity define the requirements that data must observe to be fair and consistent with the reality it reflects.

Integrity restrictions are a way of integrating data semantics indirectly into the association entity model that they enrich.

Restrictions on integrity concern:

• the values that attributes of entities and associations can take;

• entity identifier values;

• the roles played by the entities in the associations in which they participate;

• associations established between entities.

Integrity restrictions may be static (permanently verified) or dynamic (regarding the evolution over time of data). For example, restrictions on the number of the management, the type of the deposit and the units of measurement are static. The restriction on the VAT rate is dynamic and may change over time in line with the tax provisions in force.

Domain restrictions

The domain, as a set of values that an attribute can take, can be defined by a property (a condition for an attribute or a group of attributes) by specifying a range of values or enumerating the set of admissible values.

Domain restrictions are conditions (rules) that pertain to the set of admissible values for an attribute within its type or domain. Restrictions may refer to the achievements of an attribute belonging to the same entity or association, in which case intrastate restrictions or attribute belonging to different entities and / or associations are called, in which case they are called interrelationships.

Structural Restrictions Identifying Entities

Each entity will need to be unequivocally identified. This requires the entity identifier to take unique values different from NULL (NULL means that no value has been assigned, so NULL is different from zero or space).

In defining the EA model, we may encounter more specific cases of identifying entities: We can not define an identifier in the form of an attribute / group of attributes for a particular type of entity. Example: For each employee of the company, the monthly presence is recorded by keeping the hours actually worked, the absences, the sick leave hours. Identifying Entities Presence is done by the role Performed by the Employee Entity in the Associa tion Register The entity identification of entities can only be achieved if the association in question is not cyclical (unary) and the cardinality of the identified entity-association couple is 1.1 and the cardinal value of the couple identifier - association is 1.1 or 0.1.

The identification of an entity can be accomplished by one or more of its own attributes along with the role played by another entity within the association.

In addition to specifying the number, the policy date, the insured amount and the specification of payment premiums with the date of the payment and the payment amount, we consider a life insurance policy (we consider that the amounts are different from one maturity to the next). Each policy is identified by number, uniquely assigned. For the type of Maturity entity, the Maturity date attribute can not be an identifier because multiple policies have the same payment deadline on the same date. Identification of the Prime Insurance entities will be achieved through the values of their own attribute Date of Maturity and the Role Playing role of the entity Insurance in association (Bakos 2016; Spence 1975).

Role integrity restrictions

In defining the association, I emphasized that it expresses the established link between different entities, each of which plays a role. Starting from the

roles played by entities within the associations, we can define a series of integrity restrictions, namely: equality, inclusion and role exclusion.

Restriction of role inclusion. The role-inclusion restriction states that if an E1 entity that plays the r1 role in the A1 association will also have to play the r2 role in the A2 association. It follows that the role r1 includes (by inclusion) the role r2.

An example is the CDM sequence developed for an insurance company. Clients conclude insurance policies and receive indemnity to produce the insured risk if they are up to date to pay insurance premiums. There is an inclusive inclusion restriction between the compensated role and the paid role. It is also a restriction of integrity on the compensated and terminated roles the policy entity plays.

Role Restriction

Equality of roles implies that the role-sharing restriction between roles is reciprocal. The persons who have a role in the financial administration, so they play the role of the owner in joining Are, means that they have fiscal obligations, so they play a role as a taxpayer in the association. It is true, and reciprocal is valid: everyone who has tax obligations must have open a role. But not all people are taxpayers, so there are entities of the type Person who does not play the role of the Owner in association Has (Spence 1975; Lloyd 1987).

Ex: In economic applications it could be used Feature Templates (template functions)

You can define functions that work on different types of data, the function code being written once using a generic date type. In this case, a pattern is created that automatically generates the functions of each top.

The syntax for declaring a template function is:

template <[list of types] [, [list_arguments]]> statement

where:

- list_types - is a list of date types, indicated under

form class id;

- list_arguments - is a list of arguments given in the form

id_type_name.

The function that calculates the minimum of the elements of a vector will be defined, the vector elements being of a character type (whole on a snake), long or short, or floating point:

```
#include<stdio.h>
#include<conio.h>

// definire template
template <class T>
T minim (T a[], int n)
{
      T m=*a;
      for(int i=1;i<n;i++)
      {
            if (a[i]<m) m=a[i];
      }
      return m;
}

// the main program calls the minimum function for two types of
data: int and double

void main()
{
      int v1[]={5,1,8,-9,67};
      double v2[]={3.79,4.18,9.6};
      printf("\nMinim is v1 este %d",minim(v1,5));
      printf("\nMinim is v2 este %lf",minim(v2,3));

 printf("\n");
 getch();
}
```

For example is the program that, depending on the number of values read from the keyboard, selects and automatically launches one of the functions:

a. f1 = -1, if no value is read;
b. f2 = x2, if a value is read;
c. f3 = x * y if two values are read;
d. f4 = x + y + z if three values are read;
e. f5 = x * y + z * t if four values are read.

Selecting the functions is done by checking the value returned by the scanf function, ie the number of parameters read correctly from the keyboard.

```
#include<stdio.h>
#include<conio.h>
int f1(int a, int b, int c, int d)
{ return -1;}
int f2(int a, int b, int c, int d)
{ return a*a;}
int f3(int a, int b, int c, int d)
{ return a*b;}
int f4(int a, int b, int c, int d)
{ return a+b+c;}
int f5(int a, int b, int c, int d)
{ return a*b+c*d;}

//programul principal
void main()
{
 int (*pf)(int, int, int, int);
 int v, x,y,z,t;

switch(scanf(«%d %d %d %d»,&x, &y, &z, &t))
{
 case 0: pf=f1;break;
 case 1: pf=f2;break;
 case 2: pf=f3;break;
 case 3: pf=f4;break;
 case 4: pf=f5;break;
 default: break;
}
 v=(*pf)(x,y,z,t);
 printf(«\n Rezultat=%d»,v);

 printf("\n");
 getch();
}
```

These types of algorithm helps to resolve different kinds of economic problems and through the logic implemented it might treat many scenarios. In many cases a special function resolved a specific kind of problem that is included in a more complex systems that is designed for economic applications (Schneidewind 1987; Porter and Millar 1985).

4. Conclusions

Through the implementation of mathematical models and the use of computing in specific activities, the computer system delivers enhanced valences to the information system in quantitative and qualitative terms. It is about increasing the computing capacity in terms of the volume of data processed and the operations performed, increasing the accuracy of the information, increasing the efficiency, complexity and completeness of the reporting-information situations, etc. All this leads to a greater approximation of the decision maker to the phenomena and economic processes he has in mind, with the many positive economic aspects deriving from it (Bakos 2016; Spence 1975). Regarding the relation between the information system and the informational system, it can be appreciated that the information system tends to equalize the dimensions of the information system, but it does not have the same scope as the latter, because within the information system there can be activities that can not be fully automated (Porter and Millar 1985; O'Brien and Marakas 2015). Any economic application requires a number of adaptive algorithms to resolve issues that are not part of any pattern. The flexibility of the algorithms provides extra flexibility in the complex approach of situations where all the variables or all the data of the problem are unknown.

References

Bakos, J. Y. (2016). Recent applications of economic theory in Information Technology research. *Decision Support Systems Journal*, 8(5), pp. 365-386.

Lloyd J.W. (1987). *Foundation of Logic Programming*, 2nd ed. Berlin: Springer-Verlag.

O'Brien, J.A. and Marakas, G.M. (2015). *Management information systems*. NewYork, NY: Mc-Graw Hills.

Porter, M.E., and Millar, V.E. (1985). How Information Gives You Competitive Advantage. *Harvard Business Review*, 63(4), pp. 149-160.

Schneidewind, N.F. (1987). The State of Software Maintenance. *IEEE Transactions on Software Engineering*, 13(3), pp 303-310.

Spence, A.M. (1975). The economics of internal organization: An introduction. *Bell Journal of Economics*, 6(1), pp.163-172.

AUDIT AND INTERNAL CONTROL INDISPENSABLE TOOLS IN SUCCESSFUL IMPLEMENTATION OF EU PROJECTS

Lilian ONESCU
Secretary General – National Agency for Fiscal Administration
lilian.onescu@anaf.ro

Abstract: *The last years have brought a significant dynamic at the European Union level, in a domain that is still under a consolidation process – the territorial cohesion. EU objectives are based on the concepts of a balanced, coherent and harmonious territory development, in terms of economic and social activities, in terms of environmental quality and accessibility, and also in terms of the existence of equitable living and working conditions for all the citizens, regardless of the place they live in. European Union's objectives are achieved through the successful implementation of projects, which, although at first sight are seen to be independent, in fact, their results lead in a bigger or smaller proportion to achieve the major proposed objectives. However, in order for each project to achieve its expected results, it must be permanently monitored and controlled, primarily by the beneficiary. The lack of internal controls or the incorrect application of its principles is one of the main risks leading to non-compliance with the contractual requirements of projects funded by the Structural and Cohesion Funds. The aim of the work focuses primarily on clarifying the importance of the control system, focusing on internal control in European projects and raising awareness of stakeholders about this need. The research focused, on the one hand, on the systematization and synthesis of the concepts contained in the literature and the legislation in the field; as well as the qualitative and quantitative research of the irregularities identified in the implementation of the projects with non-reimbursable financing.*

Keywords: *audit, internal control, European funds, projects with European funding, standards*
Classification JEL: *F36, F43, M42*

1. Introduction

Today more and more organizations base their work on development projects, even the European Union's objectives are achieved through the successful implementation of some projects which, although at first sight are seen to be singular, in fact, their results every lead in a bigger or smaller proportion to achieve of the major objectives proposed for each programming period. The EU's regional policy is based on transfers of funds from rich to poor countries in order to encourage development in regions lagging behind, to support the professional insertion of young people and long term unemployed, to revitalizing declining industrial areas, to modernize farming and to help disadvantaged rural areas, protecting the environment and preserving natural resources.

Audit activity is the basis of integrity, ethical values and behavior of employees, it is found in the philosophy and style of the management of operations, in the assignment of responsibilities and authority, and last but not least in the company's organization and development system employees.

Control system performance is assured by efficiency, effectiveness, economy and quality and aims the management of risk, ongoing assessment of the public entity's control system and ensuring a high level management.

Therefore it is important that, from the conceptual stage, after each step or stage of the project to provide for a phase control enabling decision-making imposed by practice. Their remediation cost is even greater as are identified later.

2. Control of project beneficiaries

2.1. Internal control at the level of project beneficiaries

Internal control is a set of procedures (accounting or otherwise, depending on the type of the project and beneficiary organization) or a system designed to promote the implementation efficiency, avoiding fraud and error. The control system is defined by the organizational structure of the project beneficiary, the integrated processes (human resources, management structure, etc.) and aims to support the achievement of project scope and objectives.

The absence of the internal control system or the incorrect application of its principles is one of the major risks for the effective and in accordance with contractual requirements of projects financed through the Structural Funds and Cohesion.

The principal models of internationally recognized internal control designed for organizing the internal control system, in order to respond risk management requirements are:

- The COSO model - SUA;

- The COCO model - Canadian.

a. The system by internal control / management - COSO model

COSO model, an integrated approach on internal control (Internal Control Integrated Framework), launched by the European Commission in September 1992. The model name comes from the report of the COSO (Committee of Sponsoring Organizations of the Treadway Commission's Committee of Sponsoring Organizations)[1].

The COSO comprises five stages which are integrated management process to improve the quality of the activity of the entity, to prevent losses and ensure a rapid response to changes occurring in the system:

- The control environment within the organization: establishes the system of internal controls by providing a structure and general subjects. It also sets out a series of principles such as integrity and ethical values, employee skills, management philosophy and style of application, human resources development and management directives.

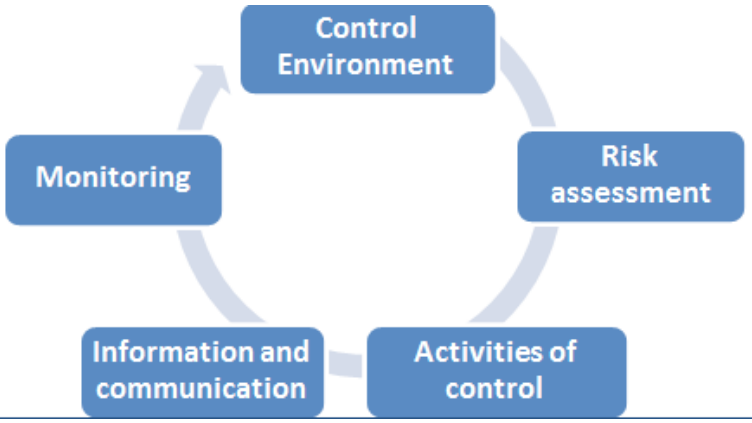
- Risk Assessment: involves the evaluation and analysis made by management, not by the internal auditors, the risks that may affect the targets

- Control activities risk: policies, procedures, controls and other practices which aim is to ensure that the objectives set by management are achieved and possible risks are addressed. Information and communication: supports all other components of COSO by communicating to employees the responsibilities for control and providing information in an appropriate and timely format.

- *Monitoring:* involves overseeing internal controls by management, overseeing the process from other external members (internal audit, monitoring bodies, etc.), or the application of methodologies or procedures independent of the type of standard questionnaires completed by employees of the internal control process.

1 In 1985 Senator Treadway, established „The Commission Treadway" (known as by National Commission Against Reporting Fraudulent) which had as main objective the analysis of causal factors that lead to fraudulent financial reporting done by companies in the United States. Following the recommendation of this committee was formed Committee of Sponsoring Organisations. Committee brought together specialists in internal and external audit, internal control have developed work - Internal Control Code, to demonstrate that the internal control activity has no direct connection with the inspection and verification activities

Figure 1. The five components of the COSO model



Source: own processing

In his work „Theory and practice of internal auditing," Jacques Renard (2002) shows that the 5 elements of internal control in the COSO model, internal audit could be added, motivation based on the fact that the internal audit contributes to the improvement of internal control systems, however, without exempt entity management obligations and responsibilities regarding the discovery and prevention of fraud and errors in the system.

Today COSO model is increasingly applied more structural funds management due to its applicability in increasing organizational efficiency in terms of managerial, financial and human resources.

b. The system of internal control/the managerial - The COCO

It was developed in 1995 by the Canadian Institute of Chartered Accountants (CICA) is composed of the same elements as COSO model, but otherwise grouped.

According to the Canadian Institute (COCO) - Internal control means all elements of an organization (culture, structure, processes, tasks and resources), which helps the staff to achieve the organization's objectives.

According to this model the personnel responsibilities is based on:

- The ability and skills that employees have (you can do);
- Understanding of job duties and objectives to be achieved (to know what to do);
- Wishing to accomplish tasks correctly and on time (to want to do);
- Performance monitoring and environmental monitoring to learn to adapt to change (adapt to change).

COCO model is considered by experts as the weak model for control, although it is more formalized than COSO.

Making a parallel between the two internal control models we can say that:

• according to the COSO model, internal control:

- is a process implemented by all employees of the entity;
- it has a relatively providing reasonable assurance regarding the achievement.

• according to the COCO model, internal control:

- it creates a greater emphasis on the means implemented than employees;
- it has an indicative character, not give absolute assurance considering that „helps achieve the objectives."

In Romania, specific legislation system of internal control / management include:

- Minister of Public Finance Order no. 946/2005, (2005) republished in 2012;
- Government Ordinance no.119/1999 (1999) on internal control and financial control;
- Government Decision no. 48/2015 on the establishment of management and control system for managing the funds granted to Romania by the Multiannual Financial Framework 2014-2020, in the field of internal affairs.

2.2. The external control system of beneficiaries of non-reimbursable funds.

In Romania, external audit is performed by the Audit Authority (AA), in accordance with national and european audit authority. The Audit Authority is an associate of the Court of Accounts, without legal personality, operationally independent of the Court of Auditors and, at the same time, independent of the Managing Authorities and Certifying Authority (Law no. 200/2005).In field of fight against fraud and / or irregularities, the national institution is the **Fight Against Fraud Department** (DLAF) (Emergency Ordinance no. 66, 2011), the body that cooperates with European Anti-Fraud Office (OLAF). Anti-Fraud Department ensures the protection of EU's financial interests in Romania, cooperate with OLAF anti-fraud coordinate activities nationwide that perform spot checks for projects financed from European funds.

At the level of Management Autority the control system includes:

- Ensuring the correctness of operations financed through operational programs and the implementation of internal controls in accordance with the principles of sound financial management and transparent;
- Ensuring that procedures for keeping an adequate audit trail;
- Conduct spot checks;
- Monitoring and verification by the Intermediate Bodies training a separate accounting system;
- Providing information on funds absorption;
- Validation and submission to the Paying Authority verified cost claims and requests for funding;
- Submission to the Paying Authority reports on the recovery of unduly and those unused.
- Making financial corrections, etc.

The control system in the European Union:

In most European Union states there is an internal audit function, but it does not necessarily cover all institutional areas. The main objectives of the audit targets a relevant coordination and harmonization. Compliance supplemented traditional financial audits are becoming more advisory services and performance audit which employs a staff of internal audit professional and well trained. Regarding external audit, in the EU Member States there is a permanent and complex working relationship, between entities which run public internal audits and those who run external audits. This relationship has developed over time, in some countries it is officially entered in laws and regulations, but in all cases even initiative is based audit organizations to avoid duplication of work and facilitate the process in terms of auditees.

3. Romania, net beneficiary of European Union membership

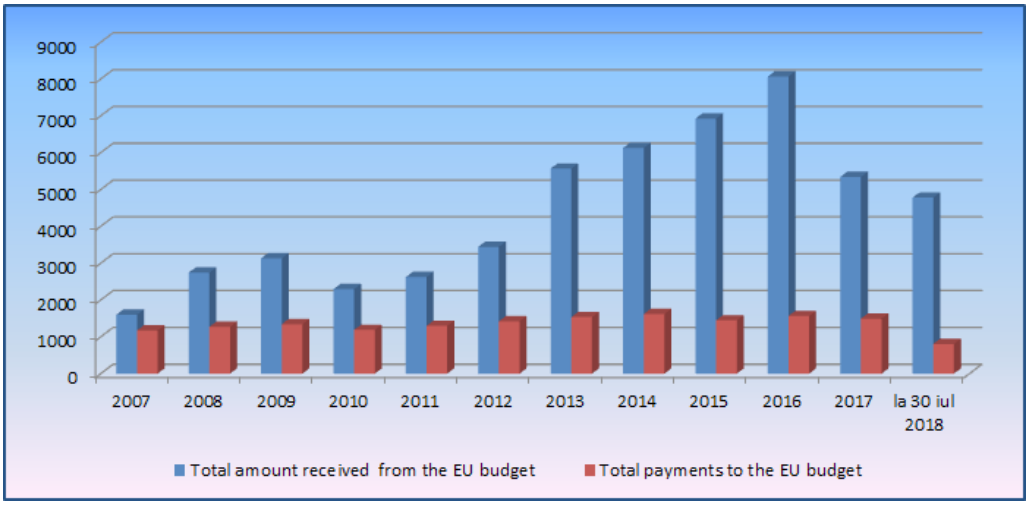
European Union is one of the most prosperous economic areas in the world. However as we point out, there are certain disparities regarding the productivity and prosperity between member states which may lead to major structural weaknesses. Since the integration, in May 2004 and January 2007, of the new 12 member states such disparities have become even more striking. As a result, European funds do not represent an inward purpose, but instruments in reaching the objectives established at the level of the European Union, of the EU member state, based on the implementation documents. Given the communitarian budgetary limits, obtaining the favorable effects of the

cohesion policy must be also supported by an integration strategy providing the cohesion of the national and communitarian policies for the purpose of achieving a balanced development in the Community.

Almost 12 years, after joining the European Union, Romania is one of the 18 member countries (Poland, Romania, Greece, Hungary, Czech Republic, Spain, Slovakia, Bulgaria, Portugal, Lithuania, Croatia, Latvia, Estonia, Ireland, Slovenia, Malta, Cyprus and Luxembourg), which received more money than paid to the EU budget (Figure 2).

Figure 2. Amounts received compared to the amounts paid to the EU budget after Romania's accession of the European Union

million Euro



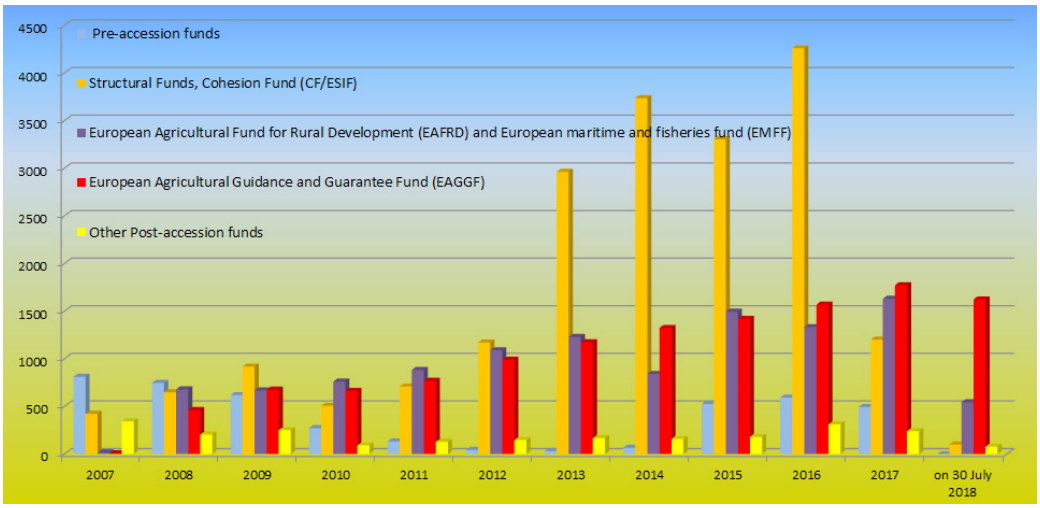
Source: own processing based on data provided by:
European Structural and Investment Funds (2018)

For the programming period 2007-2013, funds of over 42 billion euros had been allocated to Romania, including the Cohesion totaled 19 billion euros, of which have managed to absorb 90-91%.

For the 2014-2020 financial period, almost 45 billion euros are allocated to Romania, of which approximately 22 billion euros for ESI funds (European Structural and Investment Funds). On 30 July 2018, the Ministry of European Funds announced an absorption of EUR 933 million, plus another EUR 3.9 billion absorbed by the European Agricultural Guidance and Guarantee Fund (Figure 3).

Figure 3. Amounts received compared to the amounts paid to the EU budget after Romania's accession of the European Union

million Euro



Source: own processing based on data provided by:
European Structural and Investment Funds (2018)

Although Romania has been confronted during the period 2007-2013 and especially in the first years of this programming period with many problems in absorbing European funds that led to blockages and suspensions of payments, we finally had a high absorption rate. However, there are still a number of irregularities identified by the control bodies leading to the failure of the projects, many of which could be avoided if beneficiaries of non-reimbursable funds would pay due attention to monitoring and self-monitoring activities.

4. Categories of irregularities in the management of EU funded projects

At the beginning of 2017 the Audit Authority (Court of Auditors, 2016) announced that for the 2007-2013 programming period, of the total expenditures of ROL 18,593,383 thousand, certified and declared to the European Commission in 2016, the Audit Authority verified expenditures in the amount of RON 5,441,502 thousand, respectively 29,26%, with

irregularities with a financial impact amounting to RON 240,733 thousand (of which approximately 50% were financial corrections for infringements of public procurement rules).

The most frequent irregularities identified during the verification of the 1,152 requests for reimbursement of the Community funds made in 2016 were:

- insufficient capacity of the management and control to detect - through first level controls and verification procedures in place - all deviations from the applicable legal framework both within procurement and regarding the declaration of expenditure from EU funds;
- how to conduct checks first level of the responsible authorities continue to represent the area where there is the highest risk of error both in regards the compliance with the rules on eligibility of expenditure, and the rules applicable to procurement by beneficiaries of funds;
- **breach of procurement rules as well**:

- dividing the estimated contract value or purchase goods without a proper tendering procedure;
- use of restrictive criteria for eligibility of tenderers;
- declaring the winner of irregular offers;
- infringement of the rules concerning conflict of interests;
- unjustified increase value of contracts by addenda signed without ensuring adequate competition in the absence of extreme urgency brought about by unforeseeable events.

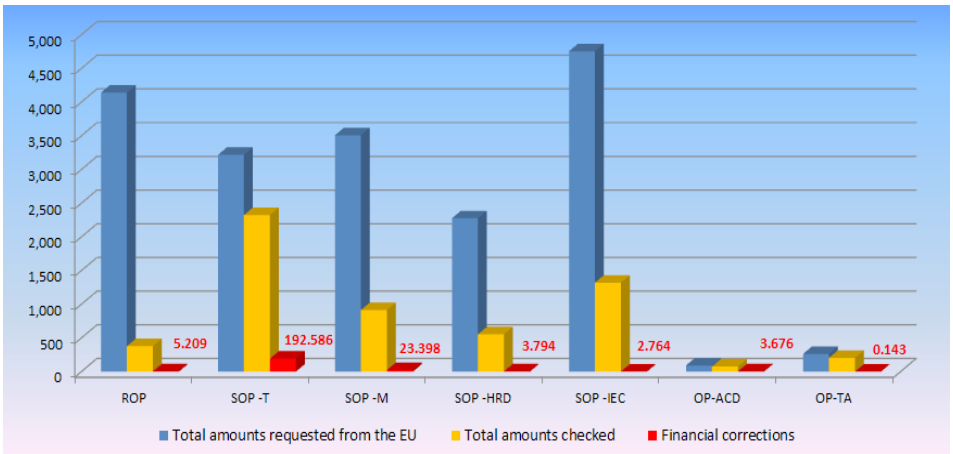
- **expenditures that were not eligible to be reimbursed by the European Commission.** Irregularities found were due completely to non-compliance with the eligibility requirements established by normative documents or procedures contained in the financing agreements or have been determined by inadequate enforcement of the work procedures. Therefore, several cases were identified as well as: granting funding for non eligible activities, non eligible projects or ineligible beneficiaries or is suspected to have been created artificial conditions to obtain financing; which have not fully accomplished the eligibility requirements or related projects were canceled; authorizing the payment of expenses doubled, unjustified expenses or not covered by in the financing, expenditure affected by errors of calculation or unreasonable values.

- **delays in the implementation of all recommendations made in previous audit reports.** The measures imposed by authorities were insufficient.

As of irregularities found on each operational program, the top irregularities is situated Sectoral Operational Programme Transport (SOP–T) with 192.586 million lei, followed by Sectoral Operational Programme Environment (SOP–M) of 23.398 million lei.

Figure 4. The impact of the financial result of checks carried out in 2016 on each operational program

million lei



Source: own processing based on data provided by: Court of Auditors (2016)

Inside of Sectoral Operational Programme Human Resources Development (SOP-HRD), have been found most serious irregularities of all the 7 operational programs for structural and cohesion funds. Deficiencies were identified at the Management Authority and the Intermediate Bodies but mostly the beneficiaries. Within the MA/IB, the main gaps identified were: quality of management checks, unrealised all on-site verification missions planned, deficiencies in the monitoring system and the financial reporting for the purposes of recording incomplete or incorrect information on rates or unrealised of conciliation between the data input by the Managing Authority and Certifying Authority and data reported to the European Commission. The among beneficiaries were identified: deviations from the rules on eligibility of expenditure with a financial impact amounting to 3,8 million lei, representing unjustifiably salaries payable management team members or implementation for a number of hours unrealistic or out provisions established by the applicable legislation, the equivalent of doctoral fellowships requested to reimbursement for PhD expelled with doctoral program or for Ph.D who have not completed

the doctoral program, leasing purchases of goods not specified in the grant application or have not demonstrated the necessity for the project, etc.

Conclusion

The control system, regardless of how it is designed and operated can only provide reasonable assurance and not an absolute entity that objectives are fulfilled. The probability of their achievement is affected by the inherent limitations of internal control. This fact is attributed to internal and external factors which were not and could not be taken into account in the design (design) system of internal control.

Internal control should be effective, will not determine additional costs and allow saving material resources, financial and human.

The control system must be regarded as a management instrument and not as a control mechanism, because it has the role of „early warning system" allowing corrective action to achieve the project objectives. The main objective of the control system is continuous measurement of project progress, pursuing issues such as procurement management, financial aspects, but also the benefits for the target group. The purpose of collecting information is to be able to determine whether the project is proceeding as planned, if they achieve their goals and objectives declared in accordance with the time limit proposed or are needed implementation of changes.

Not least the control activity is an information component of donors and those who implement the project beneficiaries on project progress and the progress of the project.

A problem will turn into a positive change only when it can not be resolved without affecting the constraints of time, money and quality.

In conclusion, a reasonable and flexible control system that can change depending on the realities, manages, not absolutely, but within certain limits, to ensure managerial objectives with greater probability and better conditions.

References

Court of Auditors. (2016). The 2016 Public Report, December 2017, http://www.curteadeconturi.ro/Publicatii/RaportPublic2016.pdf.

Emergency Ordinance no. 66 of 29 June (2011) on prevention, the finding and sanctioning irregularities occurred in obtaining and using European funds and / or related national public funds. Amended by Emergency Government

Ordinance 26/2012. Purpose: To regulate the activities of prevention, finding irregularities, laying and recovery of budgetary claims resulting from irregularities occurred in obtaining and using European funds and / or national public funds therefor, and for reporting irregularities to the European Commission or by other international donors.

European Structural and Investment Funds (2018). Accesed 20 December 2018 http://www.fonduri-ue.ro.

Government Ordinance No.119/1999 on internal control and financial control. Amended by Emergency Government Ordinance no. 2/2015.

Law no. 200/2005 on the approval of Government Emergency Ordinance no. 22/2005 for completing the Law no. 94/1992 on the organization and functioning of the Court of Accounts.

Order no. 946/2005 approving the Code of internal control / management, including the internal control standards/ managerial public entities and internal control systems development / management. Republished /Amended by Order no. 1423/2012 and through Order no. 600/2018 Order no. 600/2018.

Renard, J. (2002). *Théorie et pratique de l'audit interne.* Paris: D'Organisation Publishing House.

SUBROGATION – LEGAL FORM OF PAYMENT A MODALITY TO DISCHARGE THE BINDING LEGAL RELATIONSHIP

Alexandru BULEARCĂ, Lecturer PhD
Athenaeum University, Bucharest, Romania
Lawyer in the Bar of Bucharest
avocatura@outlook.com

Abstract: *By virtue of the principle of celerity that characterizes commercial obligations, the lender or the debtor of the pecuniary obligation may resort to a subrogation for the extinction of the binding legal relationship. The subrogation institution is both within the reach of the creditor and that of the debtor, and each of them may resort to such a payment method if this is in their best interest. As a consequence of the subrogation, the part of the binding legal relationship that resorted to such a method of payment is substituted (replaced) by a third party of the binding legal relationship, which basically takes over the rights and the obligations of the party it replaces. In other words, either of the parties of the binding legal relationship has at hand a legal institution known in the doctrine as being part of the legal forms of payment, through the use of which it can discharge the most costly or interest-bearing financial obligations, known as bearing the name of subrogation. Since the subrogation may be agreed both by the debtor and by the creditor, but it may also be legal, below, we shall only refer to the subrogation agreed by the debtor and to that agreed by the creditor, and the legal subrogation shall be subject to a separate analysis. Thus, in the following, the subrogation institution's analysis is to be done from the point of view of the comparative law, which concerns the old and the new civil code.*

Keywords: *payment, subrogation, legal forms of payment, contract, creditor, debtor, subrogation agreed by debtor, subrogation agreed by creditor*
JEL Classification: *K 1-K 12; K 2-K 22; K 3-K 33*

Subrogation

As it is well known, the payment is that manifestation of the will of the debtor of the payment obligation, following which the assumed pecuniary obligation is executed voluntarily and in nature. In other words, the payment designates that operation by which the debtor executes voluntarily an obligation to remit an amount of money to the creditor.

From a legal point of view, the payment transaction covers a much broader range of the debtor's benefits, such as the transmission or the establishment of a right, the execution of a work, the performance of a service, the delivery of an asset, of some documents, the assignment of a claim or of some transferable securities etc.

As such, it can be argued that the discharge of a binding legal relationship can be done in other ways than by pecuniary payment, provided such a modality of creditor's achievement of the claim is accepted.

Since payment is the principal means of discharging the binding legal relationship, by the term „*legal forms of payment*", one designates all legal transactions comprising a performance from behalf of the debtor of the payment and having the effect of discharging binding legal relationships in relation to which payment was made.

In view of the specific nature of our scientific approach, we shall summarize below only the analysis of legal transactions which have as object the payment of a pecuniary payment, the consequence of which is the discharge of the original binding legal relationship.

In this respect, we argue that from among the legal transactions in which one can find a pecuniary payment which is made to discharge the binding legal relationship, we list *the payment by subrogation, the imputation of payment, the offer of payment and the consignment and the assignment of the debt*[1].

Thus, with regard to **the subrogation** - which is the object of our analysis, we can say that, from a terminological perspective, the term entered the Romanian lexicon from French, *subrogation*, which in turn took it from the Latin *subrogare*, meaning *replacement* or *substitution*.

In a broad legal sense, subrogation is of two kinds, namely, the actual subrogation, which designates the replacement, in a given patrimony, of

1 As far as the assignment is concerned, we also state that under the old rules, the Civil Code of 1865, even though it was not expressly provided for, one could make the assignment of debt, which the new civil code of 2011 regulates distinctly.

an asset with another one or of an economic value with another one, taken individually, and the personal subrogation, which in a broad sense it means replacing one person with another one in a legal relationship.

On the contrary, in a narrow legal sense, the personal subrogation is defined as being a transfer of debt made through a payment. In other words, the personal subrogation is that payment transaction of a debt, in whole or in part, by a third party on behalf of the debtor.

If the conditions of the subrogation are fulfilled, the third party who has made the payment (solvens) is subrogated to the rights of the original creditor (who received the payment), and the debtor discharged in relation to the original (subrogating) creditor by the payment made by the third party (subrogated), shall be held for payment to the latter (Mestre, 1979).

In relation to these considerations, we shall summarize, in the following, the analysis of the personal subrogation consisting in transferring the claim from the subrogating creditor to the third party paying the debt, also called the subrogated creditor.

In the civil code of 1865, the subrogation payment is regulated by articles 1106-1109, in relation to which it can be defined as that legal transaction consisting in replacing the original creditor from a binding legal relationship with another one that paid the debtor's debt, thereby acquiring the creditor's debt with all its accessories.

The new civil code regulated *the subrogation* in Title VI, Chapter II, articles 1593-1598, which makes it mainly represent a way of payment of an obligation and, alternatively, a way of transferring the debt (Terre, Simler, Lequette, 1999, p. 1408; Malaurie, Aynès, Stoffel-Munck, 1999-2000, p. 733).

Given that our scientific approach aims to analyze the legal forms of payment both from the perspective of the regulation of the old civil code and of the new civil code, we shall proceed to the analysis of each institution, in the first part, from the perspective of the previous regulation, and, in the second part, from the perspective of the current regulation.

Thus, in relation to the legal provisions governing it, the subrogation appears as a hybrid legal operation (Larroumet, 2003, pp. 338-339), meaning that, on the one hand, this is a way of discharging a debt by means of payment and, on the other hand, as a means of transmitting the original debt, with all its accessories, to the patrimony of the paying third party.

In the modern doctrine, it has been appreciated that, *in terms of business matters*, one focuses on the translative effect of the debt and it has been argued

that subrogation payment is a legal means of transmitting the debt right along with its correlated payment obligation (Malaurie, Aynès, Stoffel-Munck, 1999-2000, pp. 713-725; Larroumet, 2003, pp. 337-367).

As far as we are concerned, we, *basically*, agree with this point of view, only that we believe that *the function of discharging the original payment obligation should not be either neglected*, because, by this operation, satisfaction is given to all the parties involved, respectively to the original creditor who witnessed the cashing of his / her debt, to the debtor who so avoided his pursuit by the original creditor in order to make the payment and thus obtains a postponement of the payment, and, last, but not least, to the paying third party who subrogates in the rights of the original creditor and it thus has the opportunity to make an advantageous placement.

Under regulatory rules, subrogation in the creditor's rights by paying the debt instead of the debtor is of two kinds, namely *conventional and legal* (Pop, 1998, p. 462). In other words, in order to be in the presence of a personal subrogation in the rights of the original creditor, it is not sufficient for a third party to pay the debtor's debt, but there must be either a convention in which such a possibility is mentioned or the payment falls within one of the subrogations provided by the civil code.

Thus, while the conventional subrogation is always the result of an agreement concluded either between the paying third party and the paid creditor, or between a third party who has made available to the debtor the necessary funds or the necessary means of payment and the debtor of the binding legal relationship, the legal subrogation operates as of right, without the consent of the paid creditor or of the debtor whose debt is paid.

The subrogation agreed by the creditor or ***ex parte creditoris*** is the most common form in practice. By virtue of the consent of the original creditor to receive the payment of the debt from a person other than his / her debtor, he / she transfers to the payer's patrimony, in return for payment, the debt to his / her debtor with all the accessories and shares existing at the time of payment.

Such a legal operation is regulated by article 1107, point 1, of the civil Code (1865), according to which *„whenever the creditor, receiving the payment from another person, gives to that person his / her rights, shares, privileges or mortgages against the debtor; this subrogation must be express and done at the same time with the payment"*.

Passing on to the analysis of the invoked law, it follows that, in order to be in the presence of a subrogation agreed by the creditor, the following conditions must be met cumulatively:

a) granting consent by the original (subrogating) *creditor*, to agree with the subrogation. In order to grant his / her consent, it is necessary for the paid creditor to express himself / herself outright and directly, meaning he / she agrees with the subrogation. If the subrogating person cannot personally appear to grant his / her consent, he / she may empower a representative to do so on his / her behalf. The debtor's consent in the original legal relationship is not necessary since he / she is not a party to this convention which is to be concluded between the original creditor and the paying third party;

b) granting consent to subrogation at the same time as payment. The condition imposed by the legislator is correct, because the subrogation, as we have shown, is a transfer of a debt conditioned by its payment. As such, it is not valid as a subrogation, the agreement where the original creditor transfers the debt to the third party before the debt is paid by the latter. Such a convention could, at the very most, be qualified as a subrogation promise or assignment of debt. Nor is the convention worth subrogation under which the original creditor agrees with the paying third party to transfer the debt to him / her after the payment has been made, since, in such a situation, the original creditor no longer has a debt in his or her patrimony, as it is discharged by payment. In other words, after making the payment in the original creditor's patrimony, there is no longer any right of debt because it ceased to exist on receipt of the payment and, as a consequence, it has no longer anything else to transmit to the patrimony of the paying third party;

c) unambiguous expression of the intention of subrogation. By this condition, any intention of tacit subrogation is removed. In this case, the agreement to achieve the subrogation must not contain terms or words that generate ambiguity, such as "I assign" or "I transmit" (Pop 1998, p. 261). In the doctrine, it was appreciated that the expression that best meets the requirements of the subrogation is the following one: "*I subrogate in my rights*".

Given that the subrogation is a consensual agreement, the verbal agreement between the original creditor and the paying third party is worth subrogation, provided that acceptance is express. However, in order to protect

the subrogated person's rights, he / she must resort to the production of an evidence of the subrogation agreement in order to be able to notify it to the debtor. Without notifying the subrogation agreement and its probation, the debtor may ignore the subrogation - being defended by the principle of the validity of appearances in law - and he / she can be freely discharge by paying to the subrogate.

In such a situation, the subrogated person is interested in producing evidence of the subrogation agreement that he / she must notify to the debtor. Regarding the proof of the subrogation agreement, we maintain that it must be recorded in an authentic document or under private signature.

If a document under private signature was opted for in order to prove that the subrogation was achieved in the same time with the payment of the debt, but also for the *erga omnes* opposition, it is necessary for the document to bear a certified date, according to the express provisions of article 1182 of the civil Code.

Given that, in practice, we come across countless situations in which *the ex parte creditoris* subrogation is recorded in a handwritten or typed receipt - *appropriated under the signature of a subrogating person and a subrogated person* - which contains the payment of the debt and the subrogatory expression, the condition of the certified date stays valid for the *erga omnes* opposability.

There is only one exception to this rule, which concerns the debtor who is not a third party as to the handwritten document, which establishes the subrogatory agreement because his / her legal situation does not change by transferring the debt from the subrogating person to the subrogated person, which is why the assignment it is opposable to him / her and without bearing a certified date.

In light of **the new civil code**, according to article 1594 of the new civil Code, **the subrogation agreed by the creditor** also operates through the agreement of will achieved between the original creditor and the paying third party. The draft law does not require the debtor's consent to be necessary for the validity of the subrogating *ex parte creditoris* agreement.

However, it should be emphasized that paragraph 2 of article 1594 of the new civil Code, according to which „*the subrogation operates without the consent of the debtor and any* ***contrary stipulation*** *is considered unwritten"*, has an unfortunate wording and contrary to the provisions of article 1474, paragraph 2, of the new civil Code, as are, in fact, many of the regulations contained by the new civil Code.

Thus, according to article 1474 of the civil Code, paragraph 2, „*the creditor may refuse payment made by a third party if the nature of the obligation or* ***the agreement of the parties*** *requires that the obligation must be enforced only by the debtor*". As it can be seen, the legal provisions regarding the payment allow the parties to agree as to the person that must pay in a binding legal relationship, a convention unrecognized in the matter of conventional subrogation agreed by the creditor.

As far as we are concerned, we maintain that the phrase „or the parties' convention" contained in paragraph 2 of article 1474 should be considered unwritten. Our opinion is based on the teleological interpretation of article 1594, paragraph 2, of the final thesis and article 1474, paragraph 2, of the new civil Code, from the perspective of the rule of *lex posteriori derogate priori* law. In other respects, we argue that, out of the corroborated interpretation of article 1593, paragraph 3, the final part, and article 1594, paragraph 1, both from the new civil Code, the *ex parte creditoris* subrogation must be expressly stipulated and made at the time of payment.

As it can be seen, the new civil code has neither explicitly required that the document admitting the subrogation agreement agreed by the creditor expressly bears a certified date. However, we believe that for the avoidance of fraud of the other creditors of the debtor, it is necessary that the document proving the subrogatory agreement agreed by the creditor bears a certified date (Ghestin, Billiau, Loiseau, 2005, p. 389). Otherwise, it is only opposable to the parties to the agreement.

The subrogation agreed by debtor or ***ex parte debitoris*** is regulated by article 1107, point 2, of the civil Code (1865), and we are in its presence *"when the debtor borrows an amount of money in order to pay his / her debt and he / she subrogates the lender to the creditor's rights. In order for this subrogation to be valid, the loan document and the receipt before the court must be made, one must state in the loan document that the amount has been received in order to make the payment, and in the receipt one must state that the payment was made with the money given for it by the new creditor. This subrogation is operated without the creditor's will"*.

According to the draft law, the *ex parte debitoris* subrogation is made when the debtor borrows an amount of money in order to pay his / her debt to the original creditor and he / she subrogates the lender to his / her rights (Alexandresco, 1898, pp. 604-616; Popescu and Anca, 1968, p. 30; Larroumet, 2003, pp. 348-351; Flour, et al. pp.. 231-232).

In this case, the parts of the subrogatory legal relationship bear the name of *subrogating person* (the original debtor) and *subrogated person*, the third party from which the amount of money for the payment of the debt is borrowed.

The original creditor is not part of a, *ex parte debitori* subrogatory legal relationship, and this is precisely why his / her consent is not necessary. At the same time, the original creditor can neither refuse to pay his / her debtor's debt, and, in case he / she refuses, he / she has available the procedure of the actual payment offer followed by a note that has a liberating effect.

In the legal literature and the case-law, it was admitted that the possibility to subrogate *ex parte debitoris* belongs to any person who is obliged to pay the debt together with the debtor and not only outright and directly to him / her. Such persons, who may have the initiative of a subrogatory agreement, are the heir who accepted the succession under the inventory benefit, the guarantor or the holder of a mortgaged property.

Whenever such a person pays the debtor's debt from his / her own funds, he / she operates the legal subrogation, the payer being subrogated as of right to the paid creditor's right and actions. However, if the original debt is paid with an amount of money borrowed from a third party, the lender may be subrogated *ex parte debitoris* in the rights of the paid creditor.

Due to the fact that the *ex parte debitoris* subrogation has an exceptional character, this type of subrogation has imposed on it by the law a series of more stringent conditions than the *ex parte creditoris* subrogation.

Thus, according to the provisions of article 1107, point 2, theses II and IV, for the validity of the *ex parte debitoris* subrogation, the following conditions must be met cumulatively:

a) the document proving the loan from the subrogated person and the receipt of payment of the debt to the original creditor must be signed in an authentic form. Hence, it results the fact that such a contract which establishes the *ex parte debitoris* subrogation is an authentic document, which makes the non-compliance with the solemn form of this contract to be penalized with absolute nullity. Similarly, we argue that, if such a contract is concluded by the representatives, they must have a genuine mandate;

b) in document proving the loan, it must be clearly and unequivocally stated that the amount was borrowed for the payment of a debt to an individualized creditor;

c) *in receipt containing the debt payment, which must be signed and dated by the paid creditor, it must be clearly and unequivocally stated that the payment was made with the amount borrowed from the subrogated person in this respect*. As to this mention, we rally to the opinion expressed in the doctrine (Pop, 1998, p. 263), according to which such an indication must be made in the contents of the receipt in full discharge of its liabilities, for the validity of the subrogatory legal relationship. And such a mention made, even in an authentic form, but on a separate document, does not produce the effects of subrogation. At the same time, we believe that, in order to find ourselves in the presence of a subrogatory *ex parte debitoris* legal relationship, it is necessary to make the receipt in full discharge of its liabilities at the same time as the payment. If this is made after the payment, it is devoid of legal effects because, at that time, the claim was cancelled, and in the patrimony of the paid creditor there was no longer any right of claim and, consequently, there was nothing to transfer to the patrimony of the subrogate (Hamangiu and Georgean, p. 84).

In relevant doctrine and case-law (Popescu and Anca 1968, p. 301) it was stated that the subrogatory *ex parte debitoris* legal relationship can be found by a single document, which must contain the mandatory particulars stipulated by the law both for the loan and for the payment receipt.

According to **the new civil code**, according to the provisions of article 1595, **the subrogation agreed by the debtor** takes place as a result of the agreement of will between the debtor and the third-party lender who puts funds at the disposal of the holder of the pecuniary obligation for its payment, thus subrogating the lender to the rights of the original creditor.

For the validity of the agreement, the creditor's consent is not required. In the event that the latter refuses the payment, the debtor has the option of formal notice opened, which, after being validated by the court, has a liberating effect on the debtor. However, given the exceptional nature of this type of subrogation, in order to prevent creditors from being defrauded, article 1595 of the new civil Code established, as the old regulation, a series of three conditions for its validity.

Thus, according to the new regulation, it is necessary also in the previous regulation:

a) a loan document and a debt payment receipt to be drawn up, with the distinction that both the loan document and the debt payment receipt must bear a certified date;

b) to be expressly specified in the loan agreement that the debtor has borrowed the amount of money to pay the debt to the creditor;

c) the payment receipt expressly indicates that the payment has been made with the amount of money borrowed from the third party debtor, which is, thus, subrogated to the paid debtor.

As it can be seen, the only difference between the old regulation and the current one is that the latter is more permissive in that the loan document and the payment receipt do no longer have to be concluded in authentic, notary form, but it is sufficient to bear only a certified date.

In conclusion, subrogation is a legal instrument that is part of the category of legal forms of payment, on the basis of which the interested party can completely or partially extinguish a obligational legal report – usually the most expensive, and of interest, thus enabling the economic operator to continue the activity.

References

Alexandresco D. (1898). *The theoretical and practical explanation of Romanian civil law in comparison with the old laws and the main foreign legislation,* Vol VI, Iasi: National Printing House.

Flour J, Aubert J., Flour Y, Savaux E. (2002). *Droit civil. Les obligations, 1. L'acte juridique*, 10 édition. Paris: Armand Colins.

Ghestin, J.M., Billiau, Gr. Loiseau. (2005). *Le régime de créances et des dettes*, Paris: LGDJ.

Hamangiu C., Georgean N. *Annotated Civil Code, vol. III.* Bucharest: Socec & CoSAR Publishing House.

Larroumet C. (2003). *Droit civil, tome 4, les obligations. Regime general.* Paris: Economica.

Malaurie P., Aynes L. and Stoffel-Munck P. (1999-2000). *Cours de droit civile. Les obligations*. Paris: Cujans.

Mestre, J. (1979). *La subrogation personnelle*. Paris: Librairie Générale de droit et de Jurisprudence.

Pop, L. (1998). *Civil Law, General Theory of Obligations*. Bucharest: Lumina Lex Publishing House.

Popescu T. R. and Anca P. (1968). *General Theory of Obligations.* Bucharest: Scientific Publishing.

Romanian Old Civil Code (1864).

Romanian New Civil Code (2009).

Terre F. R, Simler P., Lequette Y. (1999). *Droit civil. Les obligations*. Paris: Dalloz.

MANAGEMENT BY OBJECTIVES - FACTOR OF GROWTH IN ORGANIZATIONAL PERFORMANCE

Emilia VASILE, PhD Professor
Athenaeum University, Bucharest, Romania
rector@univath.ro

Ion CROITORU, PhD Associate Professor
Athenaeum University, Bucharest, Romania
ion.croitoru.ag@gmail.com

Abstract: *The complexity of the social, political and economic environment over the last period of time has generated a process of professionalisation of organizational management in order to implement the concept of performance within economic organizations. This was due to the difficulties encountered in accepting the concept of performance and the setting of criteria and performance measurement indicators. The performance of economic organizations in practice is characterized by: economy - obtaining the necessary resources at the lowest cost, efficiency – maximizing the results obtained from a given amount of resources, or minimizing the amount of resources for a planned outcome and effectiveness – the results achieved achieve the expected results. The determination of the level of organizational performance is determined by how human, material, informational and financial resources are used to achieve the proposed objectives to the level of expectations and how they satisfy the organizational interest.*

Keywords*: efficiency, effectiveness, performance indicators, goal management, economic organizations, organizational performance, organizational performance*

JEL Classification: *M00, M41, M42.*

Performance of economic organizations

Performance, in conceptual terms, expresses an achievement in one area of activity and is associated, in most cases, with the positive result of an action or action that leads to success. Determining performance requires a comparative analysis of the results obtained with the consumption of the factors that contributed to their production.

The good result of an organization is characterized by its ability to fulfill its mission, to procure and control its resources, to produce the goods or services it is responsible for, in terms of quality and productivity. This is possible if the organization has an approach to the use of resources available in terms of efficiency and effectiveness and if there are relationships between results, means and objectives.

The term performance of economic organizations can include several guidelines, namely, the definition of performance according to the level of achievement of the strategic objectives, the definition of the performance according to the value created and the definition of the performance in terms of productivity and efficiency.

In general terms, the performance of economic organizations is their ability to source resources in an economical manner and to use them effectively. In this sense, several specific performance dimensions can be outlined, namely:

- *resource saving*, characterized by the provision of adequate, low-cost quality resources;
- *cost minimization*, characterized by measuring the consumption of resources made to produce and deliver a particular service;
- *efficiency*, characterized by the relationship between the result obtained and the means used to obtain it;
- *effectiveness*, characterized by the ability of an organization to achieve the expected result;
- *quality of service*, characterized by the degree to which the product or service meets the needs of consumers;
- *financial and global performance*, characterized by the quality of economic services provided and the overall performance approach.

According to practices, an economic organization is performing if it is both efficient and effective in allocating and using available resources. In this context, the organization is performing well if it achieves or exceeds its established goals.

The valences of the performance of economic organizations

A feature of current managerial practice is the leadership of organizations according to rigid principles in the conditions in which effectiveness and efficiency can be improved only if modern methods of organization and leadership are used, if employees are involved in the decision making and implementation or if part of the decisions are transferred to lower levels.

In this context, the performance of economic organizations is characterized by three valences:

- *economic* - purchasing the necessary resources at the lowest cost. According to this valence, the main criterion underlying the process of implementing the strategies and policies is the economic one, ie the lowest cost.
- *efficiency* - consists in getting the most possible results with a determined level of resources or with a lower one. This involves maximizing the results obtained, or minimizing the amount of resources for a predetermined result.
- *efficacy* - the results achieved must reach the expected results. This implies the achievement of objectives defined and set by managers. In order to achieve the objectives, there must be an adequate information system, a functional organizational structure and adequate management methods and techniques that ensure the link between objectives and performance requirements.

In practice, performance is generally addressed through benchmarking of efficiency and effectiveness. Efficiency involves comparing financial, material, human, informational efforts with direct and social effects. Efficacy is measured by comparing the results obtained with the desired ones and preserving the objectives under the pre-established conditions.

Organizational performance is influenced, on the one hand, by the particularities of the organizational structure and, on the other hand, by its operating mechanisms. Mainly, organizational performance is influenced by:

- the resource economy, which aims at satisfying in quantitative and qualitative terms the interests of the organization;
- the cost of operation, which is influenced by the fact that the level of financial resources needed to finance operating costs is subject to constraints due to the insufficiency of funds in relation to the increased needs and requirements of the quality of the services provided.

- the efficiency of the activity, which is influenced by the fact that if efforts are strictly dimensioned, effects, especially social ones, are difficult to determine and can not be fully quantified;
- the effectiveness of the activity, which means the organization's ability to achieve its goals, objectives and tasks;
- the quality of the results, has a determining role within the organization, so that the process of improving the quality of services requires increased attention in order to maintain market place and balance.

In this context, practical experience regarding performance management has shown that changing the organization's approach and the role of managers are not only timely but also necessary, given the limitation of resources, the growth and diversification of the level of market requirements.

However, given that organizational performance is influenced by managerial competence, management should focus on achieving goals, achieving planned outcomes and improving the efficiency and effectiveness of activities, and managers' appreciation to be made on the basis of their ability to solve social and economic problems with which the organization is confronted.

In order to ensure the functioning of the organization, it is necessary to assess the problems with the management tools used, to establish budget forecasts, to specialize activities and to adapt managerial functions to existing constraints, diminishing or even eliminating them so as to ensure an acceptable level of performance.

The growth organizational performance

The growth organizational performance can be achieved through the structural and functional modernization of the organization, adapting to the realities of the Romanian economy and society, establishing a new organizational and functional relationship, increasing and strengthening the role of the management, and reconsidering the partnership with the shareholders.

Elements of performance of economic organizations can be identified as follows:

- *the referential system*, defined by the mission of the organization, the strategic options, the strategic and operational objectives, the action plans;
- *the size of the performance*, characterized by resource saving, cost of operation, efficiency of the activity, efficiency of the organization, quality of the results;

- *performance measurement system*, defined by accepted performance criteria, established performance indicators, collection, analysis and reporting system, monitoring and evaluation, use of performance information.

The main causes that may limit organizational performance growth can be identified by lack of development strategies, financial constraints, insufficient training and experience of managers and staff to meet job requirements and requirements, overuse of old organizational and functional structures in the context of which activities, functions or salaries have changed.

Starting from the existing realities, we believe that the process of improving organizational performance needs to involve changes on several levels, as follows:

- *strategically*, by redefining the role of the organization and putting emphasis on performance;
- *legally*, by diminishing legislative density and wider use of framework laws, which creates greater scope for action;
- *organizationally*, by reducing hierarchical levels, simplifying procedures, delegating the execution of tasks to lower levels;
- *cultural*, by changing the values and modes of action of managers, staff, and interest groups;
- *information*, through the introduction of information and communication technology, which offers possibilities for increasing the administrative capacity and increasing the efficiency of the activities.

The dominant idea of increasing organizational performance is the establishment of adequate functional structures and the use of modern methods of mobilization and use of the available resources (human, material, informational and financial) in order to fulfill the functions and responsibilities in optimal conditions.

Also, in order to increase performance, changes must also shift from concentration on inputs and budgets to concentration on outputs and quality growth, as competitive economy, cost reduction and quality improvement are essential to maintaining the organization on the job market.

The design of a modern management system involves the establishment of a set of principles, norms, rules, working methods, standards, responsibilities, acting as a unitary one and contributing to the performance of the organization's

performance. These must be consistent with the purpose and objectives that management has set out to achieve.

In this respect, the main responsibilities of management should be on the use of funds and property management, ensuring the legality, regularity and efficient and rational use of funds and patrimony management.

Designing and implementing a high-performance organizational structure is a complex process for any manager, the organizational structure being the main tool by which it acts to achieve predetermined objectives.

Reorganizing the management system so that it is efficient and effective to ensure performance management performance must ensure management by objectives, the definition of concrete and measurable objectives, and the establishment of clear performance measurement mechanisms.

Objective Management is a system through which an organization's leadership translates the general objectives set out in the organization's strategies and policies into specific objectives defined for each functional structure.

This system is made up of a set of well-harmonized elements, the sizing of which makes the efficient use of resources and the achievement of economically and socially significant results, namely:

- *a set of objectives*, encompasses all the objectives set by management, regardless of the level at which they are defined, the time horizon, the degree of coverage or the hierarchical level;
- *activity programs*, include concrete actions to achieve the objectives;
- *budgets,* refers to all the resources necessary to achieve the objectives;
- *the methods used to carry out the activities* include the tools, techniques and instructions that management uses to achieve the proposed objectives;
- *achieving programs*, involves achieving what the organization has planned.

These elements include controlling the achievement of objectives, which is necessary for both the upper and lower management levels, and requires each manager to have controls set for each activity and objective for which he is responsible.

Advantages and disadvantages of management by objectives:

Advantages	Disadvantages
Provides a clear picture of the entity's present and future; Allows a rational allocation and use of the entity's resources; Establish the role of each employee within the entity; Responsible for staff; Allows proper evaluation of employee performance; Motivates employees; identifies potential areas within the entity.	Increased rigidity; High time horizon for its implementation and application; Ask for top management, who must provide continuous support to employees.

The implementation of management through objectives has an impact on managerial activities and decisions, mainly in terms of management, management and planning, as well as improving management style, behavioral change, measurement and evaluation of managerial performance.

Concrete and measurable objectives imply the use of the term SMART as an acronym for the characteristics considered essential for an objective, namely:

a) *specifically*, it requires a specific formulation and expression, unambiguous, indicating what is to be achieved. The wording should not provide much detail, but it must be sufficient to communicate a clear requirement. A goal is specific if all people involved in achieving that goal understand the same way they do.

b) *measurable,* it assumes that there is a possibility to carry out a precise assessment of the activities carried out to achieve the objectives. A measurable objective is that which enables it to be accurately determined whether it has been fully achieved or the extent to which it has been attained.

c) *can be achieved*, assumes that the goal can really be achieved. If the persons who carry out the activities necessary to achieve the objective believe that the established objective is difficult or impossible, then they will no longer try to strive to achieve it.

d) *realistically*, it assumes that the objective is compatible with other entity objectives and contributes to the impact of the program. A first aspect to be considered refers to the fact that the goal must be something that is important and necessary to accomplish.

e) *fixed in time*, involves setting the time horizon required to achieve the goal. If there is no clear delineation of the timeframe, there will be no effective way to assess progress.

Taking into account that organizational performance is characterized as achieving organizational goals, we believe that goals must be set so as to pose challenges for management and employees.

Applying the management system through objectives has beneficial effects for the organization as it facilitates effective control over all activities, motivates employees to participate in the achievement of objectives, and creates a coherent organizational framework that fosters collaboration between all structures within the institution.

Performance measurement mechanisms are a process that links the concept of performance with the indicators used to measure the results. In the broadest sense, performance measurement is based on the following principles:

- *clarity,* specify the beneficiary and how to use the information. For this, parties needing performance information are identified, and indicators are built to contribute to full performance measurement;
- *emphasis*, involves concentrating attention on priority objectives and activities that require improvements in their realization. Management should be aware that indicators affect employees' behavior and thus use this aspect in choosing appropriate indicators;
- *alignment,* assumes that the performance measurement system is aligned with the target setting and performance review processes at the institution level. A link must be made between the indicators used to perform the different activities and the indicators used to measure performance;
- *balance*, involves establishing indicators to provide a balanced picture of performance and striving to achieve a balance between planned and realized costs;
- *refinement,* involves the continuous adaptation of indicators to the needs of the changing entity;
- *indicators,* assume that the indicators used are robust and easy to understand to be used for the intended purposes.

Devoted instruments for performance measurement are indicators that need to be established in a direct relationship with the organization, processes and personnel issues, and must relate to quantity, quality, cost and time.

Looking from the same perspective, the process of defining and setting performance indicators is complex because public services are at the border between competitive logic and social logic, which requires a balance.

Conclusions

The performance of economic organizations is characterized by improved cost-effectiveness and can be determined by comparing projections with achievements or through global productivity.

By increasing institutional performance, it is ensured that an efficient organizational system is put in place to develop activities and reduce costs, develop specific standards and compare costs and performance levels with those set. Changes in the structure of the organization, in the way they perform their activities, coincide with scientific progress. To this end, all organizations benefit from the impact of telecommunications and information technology, but they must struggle to obtain the resources needed to meet the growing expectations and needs of its service users.

The primary objective of performance evaluation should be to examine, in any organization, how it uses the funds, meet the efficiency and effectiveness requirements, and formulate recommendations on ways and means of enhancing performance.

Consequently, the overall guidelines for performance by economic organizations need to be focused on objective management and achievement of planned outcomes, management's decision-making and task-responsiveness to achieve them, as well as performance measurement based on performance indicators.

Bibliography

Ştefănescu, A. Ţurlea, E. (2010). Controversies on Measuring the Performance of Public Administration Entities in Romania*, Transylvanian Journal of Administrative Sciences*.

Bartoli, A. (2011). Management dans les organizations publiques, Paris: Dunod, 200

Croitoru, I. Calotă G. (2011). Performance efficiency in public entities - an essential feature. *Journal of Public Finance and Accounting*, Nr. 10, Bucharest.

Croitoru I, Calotă G. (2011). Performance efficiency in public entities - an essential feature, *The Journal of Public Finance and Accounting*, Nr. 10, Bucharest.

Davies, I.C. (2007). *Evaluation and Performance Management in Government*, London: SAGE Publications.

Imbrescu, I. (2010). *Elements of public management*. Bucharest: Lumina Lex Publishing House.

Stefanescu, A., Calu, DA, Ţurlea, E., Gherghina, R. and Duca, I. (2010). *New Cognitive Valences Regarding the Performance Concept in Public Sector Entities in Romania in the Context of the Current Economic Recessio*n. Metalurgia International Magazine.

Ştefănescu, A., Ţurlea, E., Calu, D.A. and Nicolae, F. (2010). *Approaches on the role of performance in public sector entities in Romania*. Analele Seria Economic Economics.

Vasile E. and Croitoru*,* I. *(*2014). *Risk Management Considerations in Economic Organizations***,** Internaţional Conference Global Economy & Governance – GEG 2014, 10-12 septembrie, Bucharest.

Vasile E. and Croitoru*,* I. (2012).The Integrated System for Risk Management - Key Factor in the Management System of the Organization*,* In *Risk Management*. Croaţia: InTech Publishing House.

ANALYSIS OF INTER-REGIONAL INEQUALITIES AND CONVERGENCE

Brînduşa Mihaela RADU, PhD Associate Professor
Athenaeum University, Bucharest, Romania
bmradu@yahoo.com

Abstract: *Regional development is a new concept aimed at boosting and diversifying economic activities, stimulating private sector investment, contributing to reducing unemployment, and ultimately improving living standards. In order to be able to apply the regional development policy, eight development regions have been set up, covering the entire territory of Romania. Each development region comprises several counties. Developments regions are not territorial administrative units do not have legal personality, being the result of a free agreement between county and local councils.*

The main objectives of regional development policy are: to reduce existing regional imbalances, with a focus on stimulating balanced development and revitalizing disadvantaged areas; to prevent new imbalances; correlation with governmental sector development policies; stimulating inter-regional, domestic and international cooperation that contributes to economic development and is in line with the legal provisions and the international agreements concluded by Romania.

The paper tries to capture the interregional inequalities and convergence of the population number indicator, total, sex and average. For this purpose, two representative coefficients were used in the analysis of regional disparities, namely: Ginny coefficient and concentration coefficient, the results of the analysis being analyzed further.

Keywords: *regional disparities, interregional convergence, population size*

JEL Classification: *C46, J11, R10, R58*

Introduction

The principles underpinning the development and implementation of regional development policies are: decentralization of the decision-making process, from the central / governmental level to that of the regional communities; the partnership between all actors involved in regional development; planning - the process of using resources to achieve set objectives; co-financing - the financial contribution of the various factors involved in the implementation of regional development programs and projects.

The fundamental objective of regional development policies is to reduce territorial disparities, to balance the levels of economic and social development of different areas. An objective of regional policy specific to this period is to facilitate structural and sector adjustments, support to economic restructuring and recovery processes, restoration and stimulation of the competitive capacity of regions, support for European integration processes. Most countries, including those economically developed, face regional disparities and consequently apply regional development strategies and policies. However, it must be borne in mind that the difficulties caused by regional imbalances and the possibilities for solving them cannot be addressed without taking into account the general level of development of each country.

One of the serious problems faced by Romania in the post-decade era was the socio-economic decline of many large urban centers and the diminishing of their role in the development of adjacent areas. Indices of regional disparities indicate significant economic, social and technical disparities, as well as quality of life. The most dynamic changes were recorded by infrastructure and demographics. The most notable positive dynamics was the index showing the increase in the number of personal cars and the number of telephone subscriptions. The level of urbanization, expressed as a percentage of urban population in the total population, remained relatively invariable, suggesting that the population did not migrate massively from rural to urban or vice versa.

Apart from the problems inherited during communism, the major causes that have determined and still determine the increase of the regional disparities can be summarized as follows: the location and scale of foreign and domestic investments in these regions; loss of competitive business capacity; the acceleration of the reform process influences, at a slower or faster pace, the increase of regional disparities; specialized workforce; tradition in craft and trade; infrastructure potential; the influence of migration; proximity

to sources of raw materials; proximity to internal and external outlets; the existence of disadvantaged areas or areas benefiting from government or international programs.

The process of stimulating regional activities, as well as their coordination with government policies to promote inter-regional cooperation, is part of a general effort to correlate the needs of the entire territory as well as the needs of the geographical, economic and cultural regions of the country. The process of regional development must also be analyzed in the wider context of the integration process in the European Union and therefore, in the process of preparing and adapting Romania to the European institutional structures, in order to successfully implement structural policies and funds.

In the short term, however, regional policies should focus in particular on mitigating the negative effects of transition economies, especially industrial reorganization. Local and regional communities have so far not shown an innovative capacity for this purpose and, unfortunately, have not become more flexible to respond effectively and quickly to the new challenges and changes required by the reorganization process of the economy. Taking into account that free initiative and entrepreneurship are the basic premises for development, the regional policy strategy should be oriented towards creating the conditions for developing the capacity of innovation of the territorial communities in order to adopt new activities that will gradually replace inefficient activities.

Analysis of inequalities and interregional convergence

Spatial inequality, one of the major topics in regional research, is usually analyzed with the help of indices that express differences in territorial structure and their variation over time. Standard methods used in empirical research to pursue the simple analysis of territorial inequality are standard deviation, the Herfindahl index and the Ginny index. For analyzes that address the factors behind inequalities and determine their variation in time and space, disparities need to be broken down, for example, by the Theil index, with the Atkinson index being indicated for very small regional inequalities.

The Ginny Coefficient (GC) is one of the most widespread indicators of disparities, both in methodological studies and in applied research, being considered a standard measure for inequality analysis. It was originally used to highlight the income inequality of individuals, and was then used predominantly in the field of spatial analysis. The Ginny coefficient (GC) is a statistical magnitude that highlights the degree of concentration of the values

of a series of statistical data. The Concentration Coefficient (CC) is an adjusted variance (depending on the number of n regions) of the Ginny coefficient.

Table 1. Calculation of the Ginny coefficient and of the concentration coefficient for the total number of population by region

	Total population of the region	**$(2*i-n-1)X_{ij}$**	**$n*X_{ij}$**
West	1807287	-12651009	14458296
South - West Oltenia	2005253	-10026265	16042024
Bucharest - Ilfov	2286524	-6859572	18292192
Center	2346562	-2346562	18772496
South East	2481684	2481684	19853472
Northwest	2581768	7745304	20654144
South - Muntenia	3047055	15235275	24376440
North - East	3263564	22844948	26108512
		16423803	158557576
The Ginny Coefficient		**0.103582581**	
Coefficient of concentration		**0.118380093**	

Source: Romanian Statistical Yearbook 2017 and author calculations

The analysis of the processed data shows that there are no significant concentrations of the population in the eight development regions, the Ginny coefficient having values of 0.10 and the concentration coefficient of 0.11 which means that there are no significant regional disparities (Table 1).

Table 2. Calculation of the Ginny coefficient and of the concentration coefficient for the number of the male population by region

	Total male population by region	**$(2*i-n-1)X_{ij}$**	**$n*X_{ij}$**
West	879077	-6153539	7032616
South - West Oltenia	985517	-4927585	7884136
Bucharest - Ilfov	1072638	-3217914	8581104
Center	1151288	-1151288	9210304
South East	1218087	1218087	9744696
Northwest	1259329	3777987	10074632
South - Muntenia	1494722	7473610	11957776
North - East	1619879	11339153	12959032
		8358511	77444296
The Ginny Coefficient		**0.10792933**	
Coefficient of concentration		**0.123347806**	

Source: Romanian Statistical Yearbook 2017 and author calculations

Table 3. Calculation of the Ginny coefficient and of the concentration coefficient for the number of the female population by region

	Total female population by region	**$(2*i-n-1)X_{ij}$**	**$n*X_{ij}$**
West	928210	-6497470	7425680
South - West Oltenia	1019736	-5098680	8157888
Bucharest - Ilfov	1195274	-3585822	9562192
Center	1213886	-1213886	9711088
South East	1263597	1263597	10108776
Northwest	1322439	3967317	10579512
South - Muntenia	1552333	7761665	12418664
North - East	1643685	11505795	13149480
		8102516	81113280
The Ginny Coefficient		**0.099891362**	
Coefficient of concentration		**0.114161556**	

Source: Romanian Statistical Yearbook 2017 and author calculations

It is also noticed that there are no significant concentrations in the total male population nor in the total female population (Table 2 and 3) Ginny coefficient with values of 0.10 and 0.09 and the concentration coefficient is 0, 12 respectively 0.11. The concentration of the urban population is also small (CG = 0.11). The rural population can be considered less concentrated, meaning there are some disparities (CG = 0.45), but this value is due to the Bucharest-Ilfov region, which is strongly urbanized. The male and female rural population is also slightly concentrated (CG = 0.46 and CG = 0.45, respectively) (Tables 4 - 9).

Table 4. Calculation of the Ginny coefficient and of the concentration coefficient for the number of the urban population by region

	Total urban population by region	**$(2*i-n-1)X_{ij}$**	**$n*X_{ij}$**
West	924269	-6469883	7394152
South - West Oltenia	1110275	-5551375	8882200
Bucharest - Ilfov	1204187	-3612561	9633496
Center	1321626	-1321626	10573008
South East	1351752	1351752	10814016
Northwest	1356934	4070802	10855472
South - Muntenia	1358669	6793345	10869352
North - East	2041867	14293069	16334936
		9553523	85356632
The Ginny Coefficient		**0.111924789**	
Coefficient of concentration		**0.127914044**	

Source: Romanian Statistical Yearbook 2017 and author calculations

Table 5. Calculation of the Ginny coefficient and of the concentration coefficient for the number of the male urban population by region

	Total male urban population by region	**$(2*i-n-1)X_{ij}$**	**$n*X_{ij}$**
West	445439	-3118073	3563512
South - West Oltenia	533048	-2665240	4264384
Bucharest - Ilfov	577528	-1732584	4620224
Center	635529	-635529	5084232
South East	649633	649633	5197064
Northwest	650759	1952277	5206072
South - Muntenia	654192	3270960	5233536
North - East	952190	6665330	7617520
		4386774	40786544
The Ginny Coefficient		**0.107554442**	
Coefficient of concentration		**0.122919363**	

Source: Romanian Statistical Yearbook 2017 and author calculations

The male and female population in the urban area is heavily concentrated with Ginny coefficients of 0.11 and 0.12 respectively (Table 5 and Table 6).

Table 6. Calculation of the Ginny coefficient and of the concentration coefficient for the number of female urban population by region

	Total female urban population by region	**$(2*i-n-1)X_{ij}$**	**$n*X_{ij}$**
West	478830	-3351810	3830640
South - West Oltenia	577227	-2886135	4617816
Bucharest - Ilfov	626659	-1879977	5013272
Center	686097	-686097	5488776
South East	700993	700993	5607944
Northwest	704477	2113431	5635816
South - Muntenia	707301	3536505	5658408
North - East	1089677	7627739	8717416
		5174649	44570088
The Ginny Coefficient		**0.116101386**	
Coefficient of concentration		**0.132687299**	

Source: Romanian Statistical Yearbook 2017 and author calculations

Table 7. Calculation of the Ginny coefficient and of the concentration coefficient for the rural population indicator by region

	Total rural population by region	**$(2*i-n-1)X_{ij}$**	**$n*X_{ij}$**
West	478830	-3351810	3830640
South - West Oltenia	244657	-1712599	1957256
Bucharest - Ilfov	697012	-3485060	5576096
Center	994810	-2984430	7958480
South East	1080984	-1080984	8647872
Northwest	1160058	1160058	9280464
South - Muntenia	1224834	3674502	9798672
North - East	1842868	9214340	14742944
	1904895	13334265	15239160
The Ginny Coefficient		**0.455771716**	
Coefficient of concentration		**0.520881961**	

Source: Romanian Statistical Yearbook 2017 and author calculations

In the case of the rural population, both the total and the sexes show a high degree of non concentration, the Ginny coefficient having values around 0.5 (Table 7, Table 8 and Table 9).

Table 8. Calculation of the Ginny coefficient and of the concentration coefficient for the number of the male rural population by region

	Total male rural population by region	**$(2*i-n-1)X_{ij}$**	**$n*X_{ij}$**
West	120448	-843136	963584
South - West Oltenia	346029	-1730145	2768232
Bucharest - Ilfov	500529	-1501587	4004232
Center	540078	-540078	4320624
South East	582558	582558	4660464
Northwest	609696	1829088	4877568
South - Muntenia	917194	4585970	7337552
North - East	965687	6759809	7725496
		13217347	28921704
The Ginny Coefficient		**0.457004435**	
Coefficient of concentration		**0.522290783**	

Source: Romanian Statistical Yearbook 2017 and author calculations

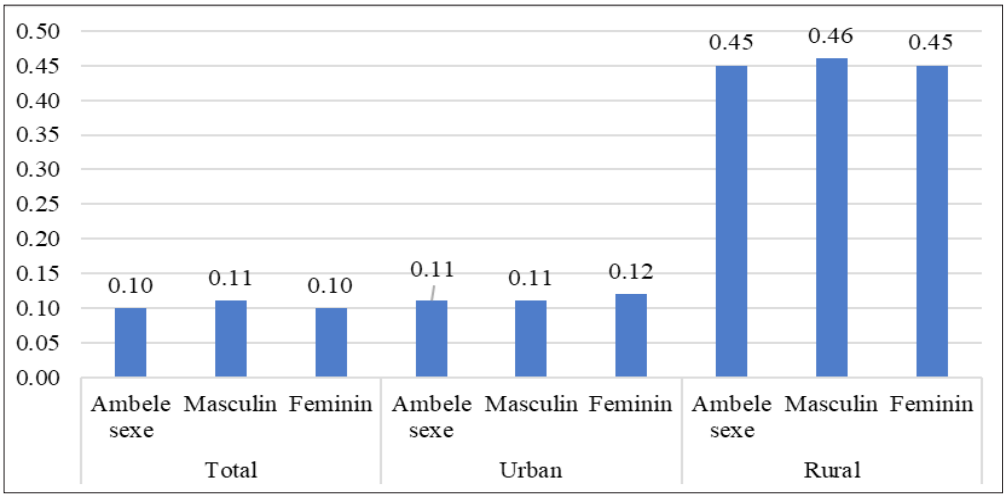
Table 9. Calculation of the Ginny coefficient and of the concentration coefficient for the number of female rural population by region

	Total female rural population by region	**$(2*i-n-1)X_{ij}$**	**$n*X_{ij}$**
West	124209	-869463	993672
South - West Oltenia	350983	-1754915	2807864
Bucharest - Ilfov	494281	-1482843	3954248
Center	540906	-540906	4327248
South East	577500	577500	4620000
Northwest	615138	1845414	4921104
South - Muntenia	925674	4628370	7405392
North - East	939208	6574456	7513664
		13084834	28787408
The Ginny Coefficient		**0.454533246**	
Coefficient of concentration		**0.519466567**	

Source: Romanian Statistical Yearbook 2017 and author calculations

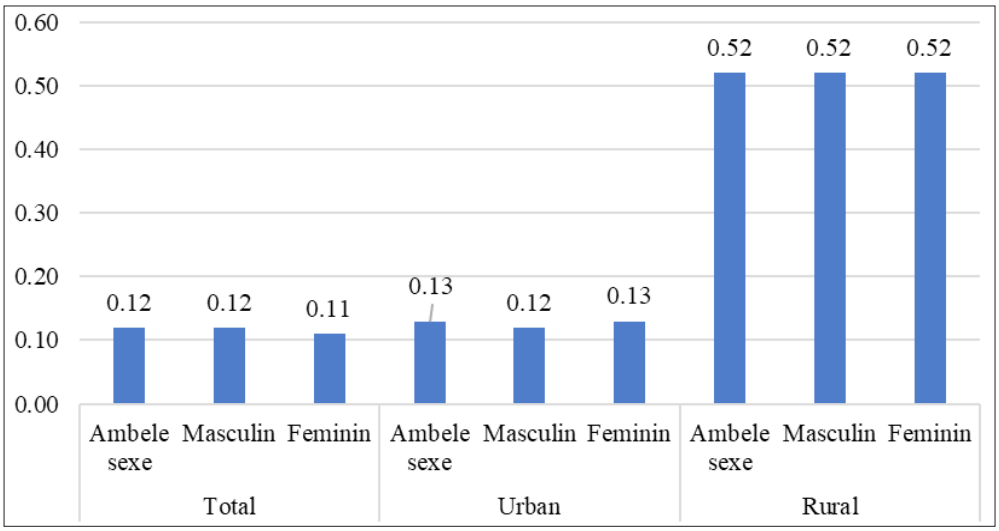
Regional concentration and regional disparities are presented graphically in Figure 1 and Figure 2. As we have mentioned both concentration and disparity is better on the total population registered in the eight development regions, as well as in urban areas (both genders, masculine and feminine). In rural areas, however, the situation is quite different in both sexes, male and female.

Figure 1. Regional concentration of the population by sex and area in 2016



Source: Romanian Statistical Yearbook 2017 and author calculations

Figure 2. Regional Disparity of population by sex and area in 2016



Source: Romanian Statistical Yearbook 2017 and author calculations

The results of the different methods applied to the convergence / divergence process in Romania indicate the same tendency to increase territorial inequalities over a longer period of time, with some deviations in sub periods depending on the evolution of the national economy as a whole.

Conclusions

The overall picture at national level is an aggregate dimension of the state of affairs existing in all eight development regions, each of which can then be analyzed from a multidimensional perspective within the following sections of the present study.

The analysis carried out in the paper highlights that both the concentration and the disparity are better on the total population registered in the 8 development regions as well as in the urban area (both for both sexes, male and female), in rural areas the situation with - totally different, both overall and male and female.

Bibliography

Ailenei, D.; Dobre, M.; Ţâţu, D. (2009), Diminuarea disparităţilor pe piaţa muncii – condiţie esenţială pentru realizarea coeziunii economice şi sociale, în Supliment revista Economie teoretică şi aplicată, p. 29-33, ISSN 1842-8678;

Barro, R.; Sala-i-Martin, X. (1995), Economic Growth, New York, McGraw-Hill;

Constantinescu, M.; Constantin, D.L. (2010), Dinamica dezechilibrelor regionale în procesul de integrare europeană: modelare, strategii, politici, Editura A.S.E., Bucureşti;

Antonescu D., (2014), Identificarea disparitatilor şi convergenţei economice regionale în uniunea europeană şi în România, https://www.academia.edu/7051310/IDENTIFICAREA_DISPARITATILOR_SI_CONVERGENTEI_ECONOMICE_REGIONALE_%C3%8EN_UNIUNEA_EUROPEANA_SI_%C3%8EN_ROM%C3%82NIA;

Ileanu, B. (2008), The Current State and Dynamics of Regional Disparities in Romania, în Romanian Journal of Regional Science, Vol. 2, No. 2, p. 80-105;

Radu, G., (2012) Methods and techniques of social research, ProUniversitaria Publishing House, Bucharest, ISBN 978-606-647-561-7;

Institutul Naţional de Statistică (2018), Baza de date TEMPO - serii de timp, https://statistici. insse.ro/shop/.

ROMANIA - BETWEEN THE RECOVERY OF GAPS AND THE AMPLIFICATION OF SOCIAL INEQUALITIES AND POVERTY

Radu GHEORGHE, Lecturer PhD
Athenaeum University, Bucharest, Romania
radu.gheorghe@univath.ro

Abstract: *There is a paradox of Romania's economic and social transition process: its more and more visible economic progress in recent years has been accompanied by a complex process of deepening intra-regional disparities but also of increasing poverty in some regions / counties of the country. For the time being, socio-economic consequences, which are becoming more and more complex, are not being assessed. This reinforces even more the idea that besides the fact that in the comparisons of living standards between countries GDP per capita has a major role, it says too little about how income is distributed among the population or about the existence of other non-monetary factors which can influence the quality of life of a population.*

Keywords: *cohesion, cooperation, cross-border, development territorial profile, disparity index, gross domestic product per capita, environment, gap, imbalance, monetary factors, poverty, region, social exclusion, the threshold of relative poverty, the poverty risk ratio*
JEL Classification: *Z13*

What is social inequality?

According to the Sociology Dictionary, social inequality is defined as "*a notion that highlights the differences between positions occupied by individuals or social groups on a hierarchical scale, attached to a social characteristic*"

which "*can be regarded as a particular aspect of social differentiation, its specific consisting in the fact that it requires a comparison of the hierarchical elements*" (Vlasceanu and Zamfir, 1998, p. 292).

Generally, the concept is used when "rankings on a scale can be interpreted in appreciative terms - favorable / unfavorable, desirable / undesirable etc., so when there is a possibility of a socially valuing appreciation."

It also should be emphasized the distinction that should be made between "natural and social hierarchies". If some of them are the consequences of the "innate factors," which hierarchizes the place of the individuals according to their physical or psychic nature etc, the others are established by "institutions, standars (moral and legal), values etc" (Vlasceanu and Zamfir, 1998, p.292-293).

Not only sociology provide a vast field of analysis to the concept of social inequality (sociology of social stratification and mobility, sociology of education, sociology of culture, etc.). Various conceptual aspects are also debated "in philosophical, ethical, political literature". This complicates the thematic approach by sociology who is warned in some way to note the existence of ideas and methods specific to these disciplines regarding the issue of social inequality (Vlasceanu and Zamfir, 1998, p. 293).

Generally, social inequality is addressed either through a qualitative assessment process, either through a quantitative evaluation process. This analysis puts a stronger emphasis on the second approach, analyzing Romania's place within the EU in terms of the latest data on poverty and social inequality.

Watching carefully the official data, we find that there is a paradox of Romania's economic and social transition process: its visible economic progress in recent years is accompanied by a complex process of deepening intra-regional disparities and increasing poverty in some regions of the country. This reinforces even more the idea that besides the fact that in the comparisons of living standards between countries GDP per capita has a major role, it says too little about how income is distributed among the population or about the existence of other non-monetary factors which can influence the quality of life of a population.

Sociology considered social inequality as the fundamental premise of social stratification. The problem of social inequality is not new. History records a multitude of approaches. "Stratification is universal and omnipresent", says Mohamed Cherkaoui, pointing out that in this situation have found the most simple and homogeneous societies, as well as those "more differentiated and heterogeneous", absolutely everything "being made up of vertical divisions

based on sex, age, family structure or on material wealth, power and prestige" (Boudon, 1992, p. 116).

According to him, there are four logical stages which describe the evolution of stratification theories:

- The first is pre-scientific and seeks a basis for stratification in "nature or transcendence",
- The second focuses on the "immanent origin of inequality",
- The third considers social processes as basic elements of social inequality;

The fourth presents an attempt to synthesize the whole issue "based on psycho sociological concepts considered as elementary and fundamental" (Boudon 1992, p. 117)**.**

In "*Discourse on the origin and basis of Inequality among men"* Jean-Jacques Rousseau (1712-1778) tried to explain the origin of inequalities exclusively through the "the dawn of birth of private property". Using in *The Discourse* in a personal key the two very popular concepts in the seventeenth and eighteenth centuries - "natural state" and "social contract", Rousseau suggested that in its evolution the society has undergone three stages:

a. "The natural State",
b. "The birth of the first human societies",
c. The emergence of human societies based on the property.

Rousseau deliberately considered the concept of "natural state" as a "necessary supposition", which rather "supports the genetic explanation of social life" being fully aware by the "hypothetical character of this idea". Rousseau argues that in their natural state people are free, equal and without property (emphasizing the existence of objective laws, as fuels necessary for the emergence and development of society), thus placing himself in a contrary position to Aristotle (for Aristotle the sociability is the "innate part of the man") (The Discourse, Wikipedia, 2018).

In the second part of *The Discourse* Rousseau described the emergence of the private property on a Utopian background, where the primitive man, yet individualist ("although cooperation is profitable") will be forced by the historical context (climate, demographic growth, fluctuations in consumer goods, etc.) to become a consumer of several ways of life (hunting and fishing weapons also appear).

Even if we can imagine that sedentary life can generate comparisons or envy, it is not a determinant impulse to trigger the process of creating social inequalities. Cooperation and the accumulation of goods, says Rousseau, will gradually alter the primitive state of equality and will build the irreversible road of the emergence of property and division of labor, emphasizing the existence of a clear relationship between "ownership, division of labor and inequality".

It must also be added that for Rousseau the right to property is not interpreted in a key of natural law, "it does not derive from the natural law". People have accepted, they are the ones who gave their consent, the right to property being a convention, practically a "creation of positive law" (Boudon 1992, p. 117-121).

The theory of Jean-Jacques Rousseau, which describes the property as the consequence of a convention that is connected with the state institution is so close to the Thomas Hobbes theory (1588-1679) (Thomas Hobbes, Wikipedia), for which man chooses himself and artificially to become a social being. Even if the social status is not the natural state of the man, it is more advantageous for him, the man accepting by a social contract to have restricted his freedom for their own protection or safety. „Homo homini lupus," says Hobbes, the interests and selfishness of the powerful, permanently building a threat to the balance of a natural world more and more exposed to the entropy, a situation in which the social contract becomes the best solution. There had been a time when, according to Hobbes, the freedoms, rights and duties of each of us had to be established conventionally.

Generally, the 18th century will be modeled by John Locke's (1632-1704) (John Locke, Wikipedia) theory of natural property law and the 19th century will be, especially for economists and liberals, the century of the theory of the utility of Jeremy Bentham (1748-1832) (Jeremy Bentham, Wikipedia), by popularizing the *Principles of Civil Code* (theory „already drafted" by David Hume (1711-1776) David Hume, Wikipedia, in "*Essay on Justice*"). Obviously, for „socialist and utopian traditions", Rousseau's theory will remain an „inexhaustible source of inspiration" (Boudon, 1992, p. 117-121).

Sociology proposes a broader approach to the phenomenon, underlining that society is more complex. Society is not only differentiated but also hierarchical, they say. Society is made up of groups, social classes, communities, which in turn are differentiated by wealth and power.

Without claiming to have an exhaustive conceptual description, that is, in our view, the main significant sociological theories that have brought attention to the phenomenon:

- The functionalism - social inequality is the logical consequence of differentiating social functions held by the individuals or classes, categories or social classes (Talcott Parsons, Ralph Dahrendorf, Kingsley Davis, Wilbert Moore);
- Conflict theory - inequality is seen as a consequence of the unequal distribution of material goods (Karl Marx, Friedrich Engels);
- The triple dimension of stratification in Max Weber's theory - inequality is seen as a consequence of inherent differentiations related to the economic, statutory and political criterion (there is beyond the economic order and the statutory or political order, which each generates social inequality);
- Power theories - social inequality is seen as possible because always a small political elite governed the great social mass (Vilfredo Pareto, Gaetano Mosca, Robert Michels);
- Supply and demand theories - inequality is seen as a natural consequence of market economy rules, the incomes and status of individuals depend on the supply-demand relationship for each type of occupation;
- The evolutionary theory of Gerherd and Jean Lenski - attempts to unify the functionalism with the conflict theory.

All theories emphasize that the social stratification occurs with the emergence of differentiation, integration, hierarchy, conflict or social inequality. But what are the limits of the individual and social supportability concerning the inequality? Are there such limits?

2. The Relative Poverty Threshold in Romania

According to the National Institute of Statistics (2018)," The Relative Poverty Threshold represents "the available income per adult - equivalent in relation to which one person, with a lower income can be considered poor". The threshold level is determined at a fraction of 60% of the median of the distribution of the individuals in a sample, based on the adult equivalent income available. Sometimes it is called the "poverty line" (Statistici.insse.ro, 2018).

Practically, "the poverty threshold, poverty limit or poverty line is the minimum level of income deemed adequate in a particular country" (Ravallion, 1992, p. 25).

The table below describes the evolution in Romania of The Relative Poverty Threshold for the 2007-2017 period, practically a period of accelerated recovery of the gap compared to the EU in terms of GDP per capita (compared to the European average, reached a level of 63%).

Table 1. The Threshold of Relative Poverty

CN	THE YEAR	GDP per capita (USD / YEAR)	The Threshold of Relative Poverty (TRP) / USD / YEAR	TRP / GDP per capita	GDP per capita in PPS
1.	2007	8424, 74	1392,8	16,53%	44%
2.	2008	10400,54	1553,76	14,94%	51%
3.	2009	8474, 87	1575,37	18,59%	51%
4.	2010	8231, 31	1628,72	19,79%	51%
5.	2011	9150,87	1733,88	18,95%	52%
6.	2012	8558, 40	1501,84	17,55%	54%
7.	2013	9585,27	1620,54	16,91%	54%
8.	2014	10020,28	1706,03	17,02%	55%
9.	2015	8978,39	1540, 61	17,16%	56%
10.	2016	9.532,17	1609,61	16,88%	58%
11.	2017	10.813,72	1823,43	16,86%	63%

Source: The author

What does it tell us Table 1?

– In the last few years, the rate of gap recovery is very high - 5% in one year (from 58% in 2016 to 63% in 2017, relative to the European average of GDP per capita);
– The relative poverty threshold reported to GDP / capita was in Romania over the eleven years, between 14.94% (2008) and 19.79% (2010);
– This means, for example, that in 2008 the monthly average of the GDP / capita was 6.7 times higher than the average level of the relative poverty threshold, while in 2010 it was 5.05 times higher;
– In 2017 the poverty line accounted for 16.86% of GDP per capita ($ 1823.43 / year). More precisely, according to the National Institute of Statistic, a Romanian citizen could have been declared poor in 2017

if his monthly income was below the threshold of $ 151.95 per month (about 615.66 lei at an average of one dollar of 4.0517 lei).

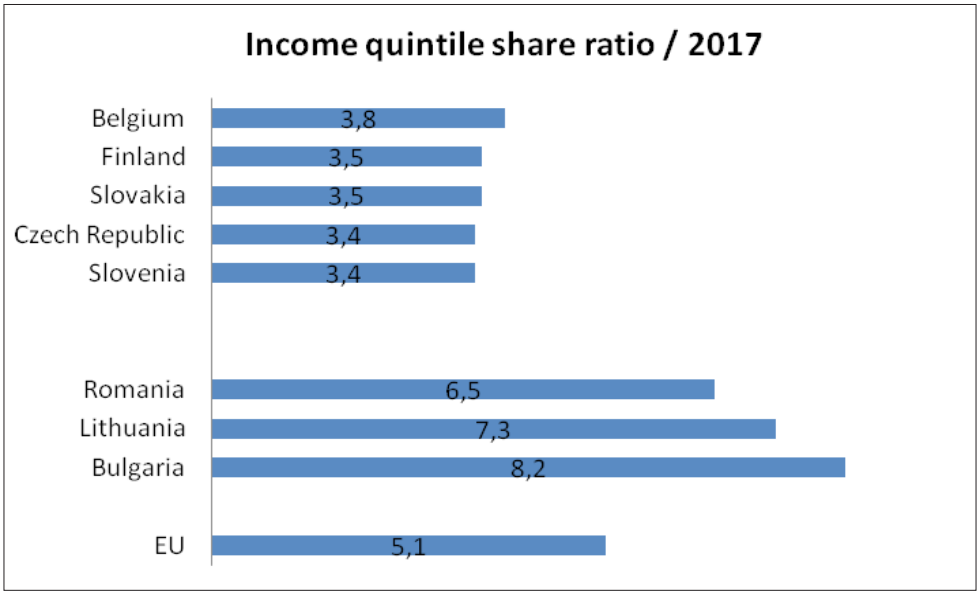
In this context, it should be stressed that because the distribution of economic resources may have a direct bearing on the extent and depth of poverty, data on economic inequality become particularly important for estimating relative poverty.

From this perspective we notice that within the EU, there were wide inequalities in the distribution of income in 2017. According to the Eurostat data:

– A population-weighted average of national figures for each of the individual EU Member States shows that the top 20% of the population (with the highest equivalised disposable income) received 5.1 times as much income as the bottom 20% (with the lowest equivalised disposable income);
– The ratio varied from 3.4 in the Czech Republic and Slovenia to 8,2 in Bulgaria.

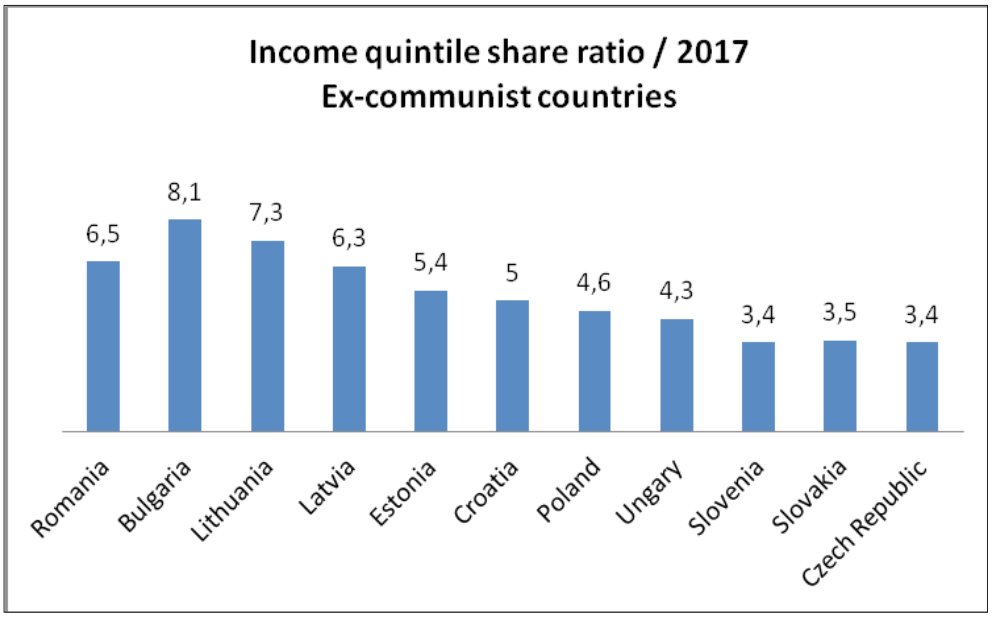
The quintile share ratio for Romania was 6,5 (Ec.europa.eu, 2018a).

Figure 1. Inequality of income distribution
(Income quintile share ratio) / 2017



Source: Author

Figure 2. Inequality of income distribution (Income quintile share ratio) / 2017 / Ex-communist countries



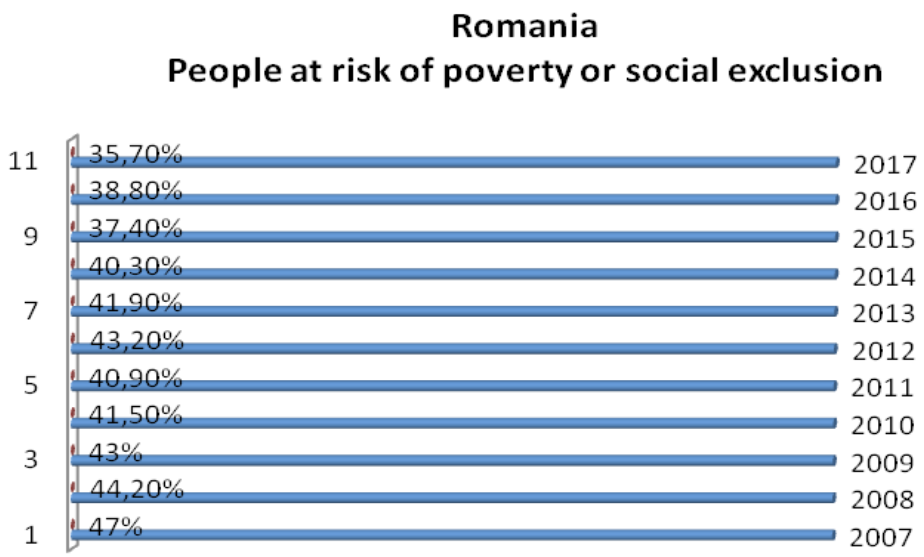
Source: Author

For Romania, the situation is not satisfactory either in terms of the risk of poverty or social exclusion. According to Eurostat data, in 2017 **35.7% of Romania's population was viewed as being at risk of poverty or social exclusion** (the EU average was 22.5%) as fallows:

– 36.5% of women, 34.9% of men (23,% - 21,6%, in EU);
– 41.7% of people under the age of 18 (24,5% - in EU);
– 33.2% of people aged 65 or over (18,1% in EU);

- 33.4% of families without children (21,9% in EU);
- 37.5% of families with children (23,0% in EU);
- 26.8% of the employed persons (12,3% in EU);
- 67.0% of the non-employed persons (64,7% in EU).

Figure 3. People at risk of poverty or social exclusion / 2007-2017



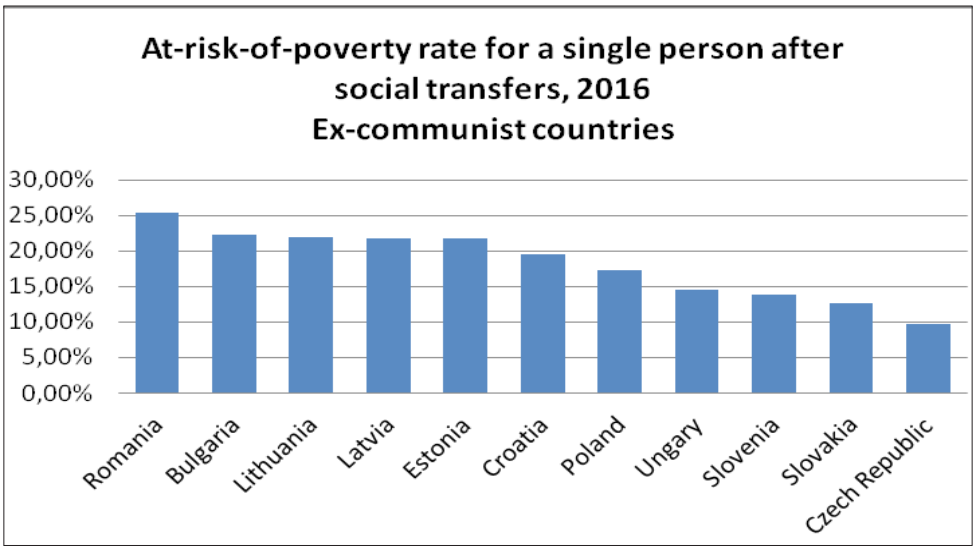
Source: Author

According to Eurostat data:

– In 2016, even if 118 million people (22.5% of the EU population) lived in households at risk of poverty or social exclusion, in reality only 17.3% of the EU population was at risk of poverty;
– The explanation for the relatively high percentage (17.3%) comes from the fact that in 2016 10.5% of the EU population, aged between 0 and 59, lived in households with very low labor intensity;
– It should also add that in 2016, 7.5% of the EU population suffered from severe material deprivation.

In 2016 Romania was at the top of the group of the eight poorest European states. **The at-risk-of-poverty-rate** who is the share of people with an equivalised disposable income (after social transfer) below the at-risk-of-poverty threshold **was in Romania 25.30%** (Serbia, Turkey, Former Yugoslav Republic of Macedonia, both non-EU states, were also part of the group).

Figure 4. At-risk-of-poverty rate for a single person after social transfers, 2016



Source: Author

At the opposite pole, according to Eurostat data, there were Czech Republic (9.7%), Finland (11.6%), Denmark (11.9%), the Netherlands 12.7% and Slovakia (12.7%).

Iceland (8%) and Norway (12.2%), which are not members of the EU but are part of the Schengen group, joined the group of countries with the lowest exposure of the population to poverty. From the group of ex-communist states, Romania remains the country with the highest risk-of-poverty rate, a quarter of the country's population living under the poverty line (see Figure 2).

According to Eurostat, in the Visegrad Group, the risk-of-poverty rate is below the EU average (17.3%): Czech Republic - 9.7%, Slovakia - 12.7%, Hungary - 14.5%, Poland - 17 ,3%. It is also worth pointing out the homogeneity of the Baltic states in terms of risk-of-poverty rate, all three being close to the 22% threshold: Estonia - 21.7%, Latvia - 21.8% and Lithuania – 21,9%.

The distribution of the income of Romania's population. The Gini Coefficient

Any public policy that aims to combat poverty and social exclusion can not avoid a very serious analysis of inequalities within society, regardless of their economic or social nature. Generally, economic data is an important barometer for the estimation of relative poverty because the distribution of

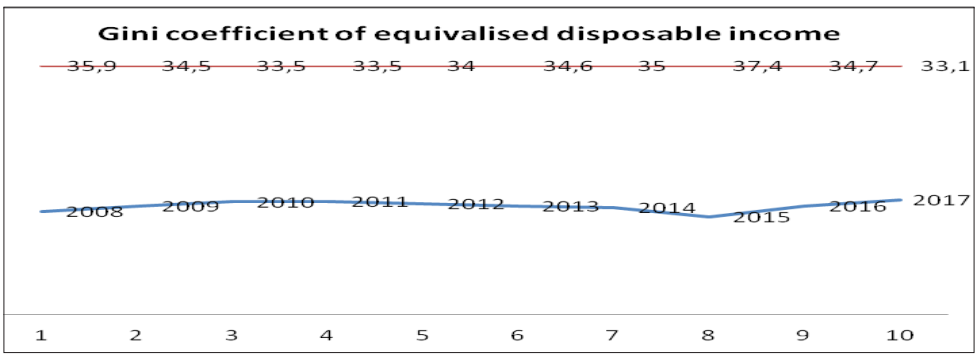
economic resources directly affects the depth of poverty. Eurostat data abounds in statistic data that reinforce the idea that there are still great inequalities in revenue distribution.

Very interesting is the analysis of the intensity of poverty (finding the answer to the question of "**how poor poverty is"**). This threshold is set at 60 % of the national median equivalised disposable income of all persons. Among the EU Member States, in 2017 **the relative median at-risk-of-poverty gap is widest in Romania - 36.2 %** (with gaps above 25.0 % also reported for Spain – 32,5%, Bulgaria – 30,5%, Greece – 30,3%) (Ec.europa.eu, 2018b). The lowest at-risk-of-poverty gap among the Member States was observed in Finland (13.9 %), Cyprus (15.1%), Czech Republic (16.6%), Hungary and Malta (16.7%), France (16.9%), Belgium (17.7%) and Netherlands (17.8%). But the most important indicator of measuring the income distribution inequality is the Gini coefficient.

According to the specialized dictionaries, the Gini coefficient is a „*measure of the statistical dispersion used to represent the distribution of a nation's population incomes, but especially to represent the disproportion in the distribution of income or wealth, being an indicator of inequality*" (Gini coefficient, 2018, Wikipedia, 2018).

Basically, it is an indicator that measures the inequality of available incomes of a population, values ranging from 0 to 100, where 0 reflects the perfect income equality and 100 the perfect inequality. Practically, the increase in the Gini coefficient reflects greater inequality in the distribution of incomes or wealth of a population. The Gini coefficient for Romania in 2017 was quite high (33.10%), Romania being seventh in EU (the podium is occupied by Bulgaria, with 40.20%).

Figure 5. Gini coefficient of equivalised disposable income (2008-2017)



Source: The author

The Figure 5 reflects very well the dynamics of the Gini coefficient in the 2008-2017, a period when the inequality in revenue distribution decreasing, if we relate to the national average, with 2.8% +(the pulsation of 2015, when again reached a high value of the Gini coefficient - 37.4%, even higher than in 2008, warns that Romania does not yet have a clear strategy to mitigate the uneven distribution of income).

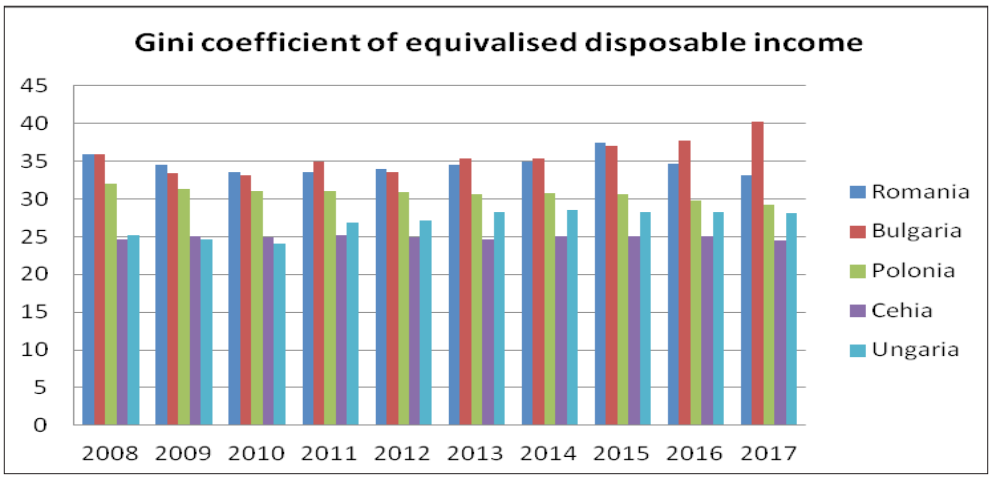
As can be seen from Table 2, compared to the Visegrad Group, Romania has one of the highest rates in terms of inequality in income distribution (the value of the Gini index for all four other Visegrad Group member states is below European average of 30.3%).

Table 2. Gini coefficient of equivalised disposable income - EU-SILC survey

	Romania	**Bulgaria**	**Poland**	**Czechia**	**Hungary**	**UE 28**
2008	**35,9**	35,9	32,0	24,7	25,2	30,1
2009	**34,5**	33,4	31,4	25,1	24,7	30,6
2010	**33,5**	33,2	31,1	24,9	24,1	30,5
2011	**33,5**	35,0	31,1	25,2	26,9	30,8
2012	**34,0**	33,6	30,9	24,9	27,2	30,5
2013	**34,6**	35,4	30,7	24,6	28,3	30,5
2014	**35,0**	35,4	30,8	25,1	28,6	31,0
2015	**37,4**	37,0	30,6	25,0	28,2	31,0
2016	**34,7**	37,7	29,8	25,1	28,2	30,8
2017	**33,1**	**40,2**	**29,2**	**24,5**	**28,1**	**30,3**

Source: The author

Figure 6. Gini coefficient of equivalised disposable income - EU-SILC survey



Source: The author

According to Eurostat, the countries with the lowest Gini coefficient are Slovakia (23.2%), Slovenia (23.77%), Czech Republic (24.5%), Finland (25.3%) and Belgium (26.0%). On the other hand, with the exception of Bulgaria (40.2%), the countries with the highest Gini coefficient are Lithuania (37.0%), Latvia (34.5%), Spain (34.1% and Greece 33.4%).

Conclusions

- Beyond the visible efforts to recover economic disparities (63% of GDP / capita from the EU average in 2017), **Romania remains a country with a very poor population and serious regional disparities**;
- According to the National Institute of Statistic **a Romanian citizen could have been declared poor in 2017 if his monthly income was below the threshold of $ 151.95 per month** (about 615.66 lei at an average of one dollar of 4.0517 lei).
- According to Eurostat data, **35.7% of Romania's population was viewed in 2017 as being at risk of poverty or social exclusion** (for the same year the European average was of 22.5%);
  - According to Eurostat data, the most affected cohort was for young people - **41.7% of people under the age of 18 was viewed as being at risk of poverty or social exclusion in 2017**;
- Moreover, in 2016 Romania was at the top of the group of the eight poorest European states. **The at-risk-of-poverty-rate** who is the share of people with an equivalised disposable income (after social transfer) below the at-risk-of-poverty threshold, **was in Romania 25.30%** (17.3% was the EU average);
- In terms of poverty intensity (how poor poverty is) Romania ranks first in Europe. Among the EU Member States, in 2017 **the relative median at-risk-of-poverty gap is widest in Romania - 36.2 %** (with gaps above 25.0 % also reported for Spain – 32,5%, Bulgaria – 30,5%, Greece – 30,3%)
- **The Gini coefficient**, **which measures inequality in the distribution of income or wealth of a population, was high in 2017 - 33.10%** (Romania ranks the seventh in the EU, while Bulgaria ranks first with a Gini coefficient of 40, 20%);
- It is a rather complicated equation for Romania's economic development, because **the lack of the middle class will certainly influence the process of economic development as well as social cohesion**.

References

Boudon, R. (1992). *Traite de sociologie*. Bucharest: Humanitas, p.116-121.

Coeficientul lui Gini, (2018a.).Wikipedia, Wikimedia Foundation, Available at: https://ro.wikipedia.org/wiki/Coeficientul_lui_Gini [Accessed 15 Dec. 2018].

Discourse on Inequality, (2018). Wikipedia, Wikimedia Foundation, Available at: https://en.wikipedia.org/wiki/Discourse_on_Inequality [Accessed 15 Dec. 2018].

Ec.europa.eu, 2018a. *Inequality of income distribution,* Available at: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_di11&lang=en [Accessed 15 Dec. 2018].

Ec.europa.eu, 2018b. *People at risk of poverty or social exclusion,* Available at: https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_50&plugin=1 [Accessed 15 Dec. 2018].

Ec.europa.eu, 2018c. *At-risk-of-poverty rate for a single person after social transfers,* Available at: *h*ttps://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:At-risk-of-poverty_rate_for_a_single_person_before_and_after_social_transfers,_2015_and_2016_(%25)_YB18.png [Accessed 15 Dec. 2018].

Eurostat, the statistical office of the European Union. 2018. *Gini coefficient of equivalised disposable income - EU-SILC survey.* Available at: http://appsso.eurostat.ec.europa.eu/nui/show.do?wai=true&dataset=ilc_di12 [Accessed 15 Dec. 2018].

Statistici.insse.ro (2018). *The Relative Poverty Threshold,* Available at: http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=SAR101A [Accessed 15 Dec. 2018].

Ravallon, M. (1992), *Poverty freak: A Guide to Concepts and Methods*. Living Standards Measurement Papers, The World Bank, p. 25, Available at: https://en.wikipedia.org/wiki/Poverty_threshold#Relative_povertyRavallion.

Vlasceanu, L. and Zamfir, C. (1998), *Sociology Dictionary*. Bucharest: Babei, p. 292-293.

FINANCIAL TECHNOLOGIES (FINTECH), INSTRUMENTS, MECHANISMS AND FINANCIAL PRODUCTS

Otilia MANTA, PhD Lecturer
Athenaeum University, Bucharest, Romania
otilia.manta@rgic.ro

„FinTech not only transforms the financial services industry but also enables financial inclusion and the opportunity to help more than 2 billion people around the world who today have no access to financial services." - Henry Arslanian

Abstract: *The holistic approach to the phenomenon of expansion of financial innovations and current financial technologies, as abbreviated as FinTech, knows very specific elements and adapted to the global financial context. Moreover, this new funding instrument has mainly emerged from the need to streamline the funding system, a technology-based system, or to provide financial services tailored to the current needs of consumers (especially those in need of funding, this is also the real reason for the coupling of fintech to the financial inclusion of those excluded financially), as well as the design of new, reliable financial products that respond to the market. Our personal experience in integrated consulting for small farmers in Romania (over 15,000 small farms benefiting from our services) as well as the design of a unique microfinance model in the Romanian market, the microfinance model „MicrofInance anTreprenor (MIT)" in 2017 with applicability in the Microfinance Micro-Enterprises (MSM) developed in the Romanian market and promoted the concept at European level through the European Microfinance Network (Brussels) under project ID 135486. The financial space is dual, presenting two often contradictory hypostases: the totality of entities, collection flows, on the one hand, and all entities, channels, stocks and placement flows, and in the current context of digital financial technologies, it is in the virtual space.*

Keywords: *financial technologies (fintech), financial inclusion and sustainable development*

JEL Classification: *G23, I22 si M21*

Introduction

The advancement of financial technologies includes robotic financial transactions, payments made through non-cash encrypted platforms, crowdfunding financial platforms, financial advice, technical and robotic assistance through virtual space, and last but not least virtual coins so developed lately. „The value of FinTech's global investment in 2015 increased by 75% to $ 22.3 billion. Corporate, venture capital and private equity firms have invested more than 50 billion dollars in nearly 2,500 FinTech companies globally in 2010" (Karakas and Stamegna, 2018). However, financial technologies (FinTech), although rapidly growing in the virtual space, have positive stances in particular related to the rapidity of financial services (adapted and flexible) to the many financially excluded, but also to risks, such challenges be especially the data and consumer protection, the risk of increased financial volatility, and the alarming increase in cybercrime). Risks in particular attract the attention of financial services regulators, and at the level of the European Commission a The Financial Technology Task Force (FTTF), which together with the European Parliament's Committee on Monetary Affairs (ECON) produced the report on FinTech published in January 2017. At the global level, G20, the Financial Stability Board (FSB) presented the report on FinTech in July 2017. Global and European concerns have been transposed into discussions/themes/ conferences and regulatory initiatives at national level.

As a result of the extensive use of FinTech, the authorities dealing with financial services regulation may face a dilemma: one based on very clear but limited rules, regulatory frameworks clearly lay down the compliance obligations of institutions involved in financial technologies, but they are often costly from the perspective of a start-up society and could be an obstacle to innovation and job creation; the principle-based financial regulation is more flexible, but it could create some uncertainty about what is exactly expected from the point of view of the compliance of those using the services of Fintech institutions.

Figure 1 Representation of Financial Technologies (FinTech)

Sursa: Karakas and Stamegna, 2018 (Financial technology (FinTech): Prospects and challenges for the EU, EPRS)

Definition of concepts according to Financial Technology (FinTech):

Prospects and challenges for EU, EPRS, Cemal Karakas, Carla Stamegna, 2018:

Blockchain: a decentralised digital ledger of economic transactions that can be programmed to record financial transactions (and more) by allowing digital information to be distributed but not copied or changed. Data packages, 'blocks', are stored in a linear chain. This technology was originally devised for the digital currency Bitcoin, but today presents other potential uses.

Crowdfunding: the use of capital from several individuals (via social media and specialised websites) to finance a business project. It allows start-up companies to raise money without giving up control to venture capital investors. In return, it often offers investors the opportunity to acquire an equity position. Critics of crowdfunding argue that funds may, for instance, be used for different purposes than those initially disclosed, or that tax laws governing e-commerce are not clearly defined, e.g. in the case of cross-border funding.

Distributed ledger: a database that is consensually shared and synchronised across multiple sites, institutions or locations. It allows transactions to have public witnesses, making cyberattacks more difficult.

The participant at each node of the network can access the recordings shared. Changes or additions made to the ledger are copied to all participants.

Peer-to-peer (P2P) lending: a method of debt financing without the use of an official financial institution as an intermediary. It can also be described as 'social lending'.

Robo-advice: covers a broad spectrum of services, but essentially involves replacing face-to face investment advice with online, automated guidance and execution. It does not involve actual robots, but rather relies on algorithms or online offerings to invest money. Potentially, robo-advice could deliver financial advice in a more cost-efficient way, making it affordable for a wider range of investors and reducing the financial advice gap.

Robo-trading: a form of automated stock trading. The best known kind of robo-trading is algorithmic trading, also referred to as algo-trading and black box trading, which is a trading system that utilises advanced and complex mathematical models and formulas to make high speed decisions and transactions in the financial markets. Algorithmic trading involves the use of computer programs and algorithms to determine trading strategies for optimal returns.

Virtual currencies: digital representations of value, issued by private developers and denominated in their own unit of account. They can be obtained, stored, accessed, and transacted electronically, and can be used for a variety of purposes, as long as the transacting parties agree to use them. The concept of virtual currencies covers a wider array, including internet coupons, airline miles, and crypto currencies such as Bitcoin.

The ***process of globalization*** inevitably leads to the reconsideration (conceptual reconstruction) of the paradigm of growth and economic development, and especially in financial technology (Fintech). The challenge, on the one hand, of the depletion and / or deterioration of resources (especially natural) and, on the other hand, of our optimization model - maximizing the objective functions of economic actors - is likely to require a radical change the options and the means by which we address this important activity of the individual and society: economic activity.

At the same time, it is obvious that economic activity can no longer be regarded in itself as a mode governed by a distinct rationality distinct from others, rationality based on a consistent and sufficient logic. Logic and economic rationality must accept, under the pressure of global problems, a permanent and fundamental communication with the other logic of individual

and social behavior (praxis). In addition, they must accept the possibility and desirability of re-evaluations, repositions, or even refunds, in light of the new paradigms of the economic process (including paradigms, for the time being, academic, such as the entropic model).

Sustainable development (or growth) is a direct function of resources of the same category, ie sustainable resources, inclusive financial resources. The subject of this study is the research of a special resource, namely the financial technology (FinTech). Studying this resource from a sustainable development perspective will lead us to the proposal and the conceptual, methodological and technological development of what we will call a sustainable financial resource. For its part, the concept of a sustainable financial resource will generate some considerations about the sustainable sources of financial resources, including Fintech - our ultimate goal, on the other hand. As we develop more broadly at the right time, the financial sources for sustainable development are more sustainable financial sources for development. This is not just a game of words but an emphasis on an extremely important idea, namely the idea that points to the depth of the sustainability feature. Since, as will be demonstrated, the financial resource (and, as a consequence, the source of the FinTech resource) is one of the foundations of any economic process, it is natural that our attention goes to ensuring this foundation in terms of sustainability in order to be able to speak with some justification and confidence about sustainable economic processes (systems).

The ***methodology of the paper*** will have as direct instruments the collection of data and information from the literature and from the existing practice in public and private institutions, but especially scientific articles published on specialized research networks (Research Gate, Academia.edu, etc.), articles published in different journals, relevant books in the field of reference, legislation, analyzes and studies, official documents of various tax bodies, tax documents and interactive database of the Federal Banks and Central Branks, other relevant sources identified at the libraries: CCFM, Academia Romanian, INCE, IEN, BNR, National ad International Library, INS, etc. Moreover, in the methodology we will analyze the documents using the comparative, analytical, descriptive method, nonparticipative and participatory observation, the use of a set of informational sources, the collection of financial data in the established databases. Also, the paper will be based on annual reports, publications, consolidated statistical data provided

by the Federal Banks, the European Central Bank (ECB), the International Settlement Bank (BRI), World Bank, CGAP, CFI, the European Commission, OECD, published annually, data to be processed in order to be able to provide a general and analytical picture of the most important changes taking place in the globally - considered representative for the understanding of the phenomena studied.

In order to test digital technologies at national level, we analyzed the capacity of their financing at the balance sheet level of the Romanian companies active on 31 December 2017. Especially in the context of current reports (Nicolescu, 2018) when about 80% of respondents in the survey self-finance. From this result we can deduce that a large number of SMEs in Romania are financially excluded and therefore do not access loans from financial banking institutions, being thus potential direct beneficiaries of FinTech financial solutions.

Starting from the analytical and predictive capacity of the theoretical methodological tools of production functions, in the present research we used one of the most used forms, namely the Cobb-Douglas production function, formulated in 1928 by American economist Paul Douglas, along with mathematician Charles W. Cobb. We used this function in its homothetic form and in the non-embedded technical progress, pursuing analytical and predictive purposes regarding the contribution of capital and labor factors to economic growth.

The existing statistical information in Romania raises a series of problems regarding the availability of data necessary for calculating the Cobb-Douglas production function, especially for the capital production factor, with its usable variants - total fixed assets, fixed assets, gross investments - chronologically convenient as a number of observations or in a territorial profile. The greatest theoretical-methodological and practical interest in using the Cobb-Douglas production function at macroeconomic level is, in our opinion, the possibility to analyze the quality of Romania's economic growth, in terms of the ***intensity of the use of capital and labor factors***, as determinants for level and structure of production and GDP.

In the analysis we started from the known form of the Cobb-Douglas production function:

$Y = A * K^{\alpha} * L^{\beta}$,

with $\alpha, \beta > 0$

where:

Y- output;

K - the capital production factor;

L - the labor factor;

A, α*,* β - constant.

Parameters α and β measure the proportion of total output that is generated by capital and labor. These two constants, in a certain sense, can also be assimilated to sui-generis elasticity coefficients.

If a + β = 1, the production function has a constant return to scale; for example, doubling the consumption of each factor, production will double.

Constanta is not just a simple proportionality factor of economic significance that is more difficult to establish but can provide information on the full **efficiency of the factors of production**.

If the sum of exponents equals the unit (α + β = 1), the Cobb-Douglas production function is linearly homogeneous, indicating constant returns to scale. If a + β> 1, the function expresses rising returns, and when a + β <1, the scale yields are decreasing.

The logarithmic transformation of the function Y = A * Kα * Lβ is frequently used in econometric analyzes, both for the estimation of the output function exponents and for the deepening of the analysis. Thus, by logging this function you get:

$$lnY = ln\ A + \alpha ln\ K + (1 - \alpha)ln\ L$$

Note that, with a one-percent increase in capital or labor, production Y increases with only α% or (1- α)%, i.e. by less than one percent, since α <1; Instead, the increase by one percent of the total productivity factor (parameter A) ensures the Y production also increases by 1%.

Economic decision makers should consider this specific growth potential when assessing the likely impact of different economic policy measures.

The available statistical data on the Romanian economy do not allow the establishment of appropriate chronological series to perform analyses based on the *Cobb-Douglas production function*, which has led us to use the cross-section analysis method. In the absence of chronological data series we have an interesting substitute for them, adopting the working hypothesis that each company integrates into a group with a similar technological process. Moreover, using the balance sheets of all active companies in the real economy, the results are representative and can effectively serve decision-makers.

The Cobb-Douglas model, in its variant based on cross-sectional analysis, it is less or not applied in Romania. The cross-sectional analysis was completed with the introduction of analytical elements in two main directions:

1. Determining the Cobb-Douglas model parameters based on the cross-over method for several years and comparing the results obtained for different years;

2. Using chronological series (with a sufficient number of terms) for labor and capital production factors as well as for output.

Research results

Specifically, in order to estimate the parameters of the Cobb-Douglas production function for Romania's economy, the balance sheet data for the companies in some sub-branches of Romania's agriculture for the period 2008-2016 was used. In order to be conclusive, the sub- 2016 have at least 200 active companies (**see appendix no. 1**).

To estimate the Cobb-Douglas function parameters, the following were used:

1. the turnover achieved;
2. the value of fixed net assets;
3. labor costs (including contributions and tax).

The statistical analysis of the three data strings reveals a homogeneous distribution of the values of the statistical series terms, a conclusion validated by the values of the multiplication coefficients (**see annex no.2**).

Estimating the Cobb-Douglas production function parameters is typically done using the smallest square method.

For the 12 sub-ranges selected from the agriculture of Romania, the results can be found in appendix no.2.

Image of the evolution of the two parameters α and β from the Cobb Douglas production function and is illustrated in the following graphs.

What is of particular interest is the results obtained from the application of the model and the conclusions of economic policy that can be deduced from the analysis of the parameters of the production function. In this respect, the preliminary conclusions that can be highlighted from the application of the Cobb-Douglas production function with two factors - labor and capital - for the romanian economy refer mainly to:

1. the labor factor has a significantly higher contribution than the capital in obtaining the total results (turnover);

2. the significant contribution of the labor force to the economic growth in the current stage of development of Romania, supports the positive economic evolutions of the last years;

3. natural population growth is negative in the last 20 years, and the migration process is significant for Romania, with integration into the EU structures. In this respect, in the future, there will be a significant problem for the firms in the analyzed sectors, in the direction of rising labor costs, as the rarity of this resource rises.

The alternative appears to be: investment in fixed assets that ensure a significant increase in labor productivity and technical provision of labour.

Relevance of the two parameters of the production function for Romania in agrozootechnical sector

From the point of view of the strategy of sustainable development of the Romanian economy, the magnitude of these parameters offers elements of substantiation of the decision in support of the promotion of a high rate of gross fixed capital formation, under the conditions of their high efficiency.

The experience of countries with strong economic start-up and lasting performance in the economic growth process (e.g. Japan, China, Norway) recorded a high rate of gross fixed capital formation over long periods, but this rate was accompanied during the respective coefficient periods sensitively raised micro and macroeconomic efficiency. Practically, it means the accumulation of new generations of technological breakthrough, strongly marked by cutting-edge technologies and the IT impact.

The agricultural sectors representative of our model (which recorded in the balance sheets of each economic agent turnover, total assets and wage costs) and reflected in the graphs and annexes below are: Cultivation of cereals (excluding rice), leguminous plants and plants oilseeds; Cultivation of vegetables and melons, roots and tubers; Growing grapes; Cultivation of fruit, berries, strawberries, nuts and other fruit trees; Breeding of dairy cattle; Pig farming; Bird breeding; Activities in mixed farms (plant culture combined with livestock breeding); Ancillary activities for crop production; Forestry and other forestry activities; Forestry and Marine Aquaculture and in Sweet Waters (Manta and Dimitriu, 2018). This data-driven information can lead us

to sizing the Fintech services market in Romania. This model can be adapted to market sizing and other states, with a downward trend relative to active business indicators.

Starting from the clear and detailed analysis of the situation of the companies that are active in rural Romania, and in conjunction with the needs and opportunities in financing agriculture, we can state that the current financial instruments and mechanisms of digital financial technologies correspond to those in real need of financing, i.e. microfinance, thus contributing to financial and economic inclusion at national and implicit European level.

Banking rules and regulations often make for what financially, impossible to access credits / microcredits or other financial products needed to operate their business. Let us not forget that the process of financial inclusion is extremely important to the macroeconomic stability at the level of each state and has a direct impact on social programs. "Lack of official identification, guarantees and credit histories; difficulties with the execution of the contract; and the high cost of serving geographically dispersed customers is just a few of the innumerable obstacles to smallholders and formal financial inclusion. Incapacity to access official financial services affects the efficient operation of agricultural value chains, as producers may not be able to maximize yields, and buyers might try to ensure an adequate supply of agricultural products. Financial services do not only allow small investors to invest in their farms, they can help reduce liquidity constraints making it difficult for buyers to pay farmers on delivery and force small-land owners to sell their crops at lower prices in exchange for a payment faster "(CGAP, 2018).

Moreover, the applicability of financial innovations to the financing of agriculture using blockchain technology solutions appear to be particularly relevant for small non-bank farmers. The need to disseminate information between several parties - including between the public and the private sector, between competitors and between different industries - means that both transparency and shared control are important and direct features of financial pollinizers. The disintermediation tool can also help overcome barriers to agricultural and rural funding as business partnerships can be implemented when there is no third-party mediation that directly influences the small entrepreneur (Gheorghe, 2013). Last but not least, the use of these innovative technologies has a direct impact on verifying the identity of small owners, a particularly important aspect for each of the small entrepreneurs / small farmers and the identity of their business.

Also based on these new digital technologies, small farmer identification data, such as a birth certificate, can be written in the registry and signed with a client cryptographic "key pair" (consisting of a public and private key). "This helps to prove that the data belong to an individual holding the appropriate private key. In turn, this key pair can be used to prove customer identity when opening a financial account or performing a transaction. Such applications open the door to creating self-sovereign identities, in which individuals choose when and what data they want to share with other parties. However, while these technologies can help in authenticating, managing identity and controlling users, it is not enough as an independent solution to demonstrate identity. Indeed, a digital identity based on digital technologies still depends on a "reality" ID to which it is linked when it is created (Yaga et al., 2018). Therefore, the lack of formal identification may remain an obstacle in certain contexts.

In order to achieve the financial inclusion of many people in need, microfinance can be functionalized using tools and mechanisms that are tailored to the small farmer, and "collateralization of assets such as land, animals, cars, stored crops, or even payments to small owners for pledged or delivered products could allow small owners access to funding for inputs, working capital and post-harvest liquidity "(CGAP, 2018).

Current digital technology helps us to create microfinance programs for financially excluded, i.e. to create mechanisms for financial inclusion by creating digital records of these assets on a distributed (for example, land registers, movable property registers, deposit bills, invoices), financial service providers (Specialized Microfinance Enterprises) may be subject to collateral-based loans. The main features of this system are transparency (the ability of multiple parties to view assets on the registry); partial control (ability of competing financial institutions to use the electronic register) and disintermediation (ability to use smart contracts to automate transfer of ownership of assets in case of non-payment without VAT third party intervention), which would make the entire financing mechanism secured in terms of microcredit reimbursement.

Policing the phenomenon of financial inclusion is trustworthy actors that ensure the smooth operation of the funding mechanism and their role is essential - even in a system designed to operate without third party intermediation. The CGAP found that on average only 5.5% of the small owners of the six markets surveyed had a smart phone (Christen and Anderson, 2013).

FinTech, is a more and more used term by financial services users, that is companies using technology-based systems, either to offer them or to try to make the financial system more efficient. Initially, with regard to technology applied in previous versions of consumers and consumers established trade financial institutions. Today, „FinTech ,s interpretation has expanded to include any technological innovation in the financial sector, including literacy and financial literacy innovations, retail banking, improved investment or offices (eg back - office functions). FinTech's expression has also become synonymous with emerging financial services in the 21st century. In this context, FinTech covers a wide range of services and products such as cashless payments, peer-to-peer (P2P) credit platforms, robotic trade, robo-counseling, crowdfunding and virtual platforms, and is expected to will continue to expand in the coming years." (Karakas and Stamegna, 2018).

In Europe, on the one hand, attention is paid to the potential contribution that FinTech could make to increase efficiency, strengthen financial integration and strengthen European Union institutions as a significant actor in global financial services; on the other hand, the need for clear, safe and effective regulation to support financial innovation, also protecting end-users, implicitly financial inclusion. Indeed, although there is more and more regulation in the field of financial services defined at European or international level, there are areas where Member States can choose to apply individualized or less stringent rules at national level (as an example we can mention crowdfunding and virtual coins). All this can lead either to environmental fragmentation impeding cross-border business expansion or a difference between financial operators, encouraging companies to obtain permits less restrictive jurisdictions to reduce regulatory burdens in service worldwide. It should also be noted that, in general, business FinTech models may not be within the regulations and licensing procedures Routine surveillance conducted by national regulators, as these rules are designed for financial services classical and by type of financial institutions (such as banks).

The interconnection of finance and technology is not a new phenomenon, it has begun since the 1860s, when the first transatlantic cable for telegraph was installed, the communications launched the first era of financial globalization, allowing for rapid transmission of financial information, ie transactions and payments throughout world. Moreover, technological progress, such as the telex, the introduction of credit cards, portable and ATM machines in the 1950s

and 60s, and the transition from analogue to digital in 1970, contributed to the speed of financial globalization (Gheorghe, 2012).

Increasing accessibility of the Internet to the Internet, introducing mobile phones, online banking and trading in the 1980s were still important financial innovations. In addition to these innovations, the global financial crisis of 2008-2009 has led to the establishment of the financial framework and the development of information technology as we know it today, and we had a direct impact on FinTech. Indeed, the post-crisis funding gap, increasing the distrust of clients (clients) in classical financial institutions and following RegTech regulations.

RegTech means „regulatory technology." It was created to address regulatory challenges in the financial services sector following the emergence of innovative financial technologies. RegTech consists of a group of companies that use technology to help businesses comply with regulations effectively and inexpensively. Using technology to comply, due to the fact that regulation is well established but with a growing focus on data, which makes reporting consistent. Based on data processing, RegTech allows companies to integrate compliance compliance requirements into business processes, improve corporate governance and management.

FinTech today comprises five major areas, for which Arner et al. suggest the following topology:

(1) Finance and investment such as alternative financing mechanisms, particularly crowdfunding and P2P lending, but also robo-advisory services;

(2) Operations and risk management to build up better compliance systems (i.e. RegTech);

(3) Payments and infrastructure, such as internet and mobile payment systems, and infrastructure for securities trading and settlement and for over-the-counter (OTC) derivatives trading;

(4) Data security and monetisation to enhance the efficiency and availability of financial services (through the use of 'big data'), to better exploit the monetary value of data, and to tackle cybercrime and espionage;

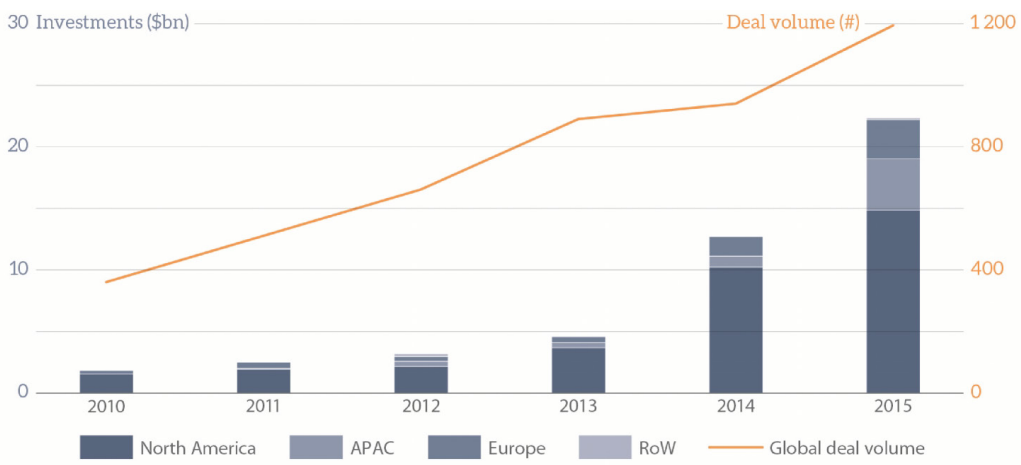
(5) Customer interface such as online and mobile financial services.

Economic prospects and challenges according to analysts, the value of global FinTech

According to analysts, FinTech's global investment in 2015 increased by 75% to $ 22.3 billion. Corporations, venture capital firms and private equity

firms have invested more than $ 50 billion in nearly 2,500 FinTech companies globally since 2010. This trend was driven by a relatively moderate increase in the FinTech sector in the United States (the world's largest), which received $ 4.5 billion in new funding (a 44% increase); a rapid growth of China's FinTech sector, which grew by 445% to $ 2 billion, as well as in India ($ 1.65 billion), Germany ($ 770 million) and Ireland ($ 631 million US). In Europe, FinTech's total investment doubled, rising by 120% between 2014 and 2015, with the number of transactions rising by more than 50%. In recent years, an increasing number of newly established businesses have raised capital directly instead of equity on peer-to-peer (P2P) loan platforms. P2P financial solutions for small businesses have seen significant growth, due to the fact that for many financial exclusions these financial services are the most affordable and provide real support for their sustainable development in the short, medium and long term.

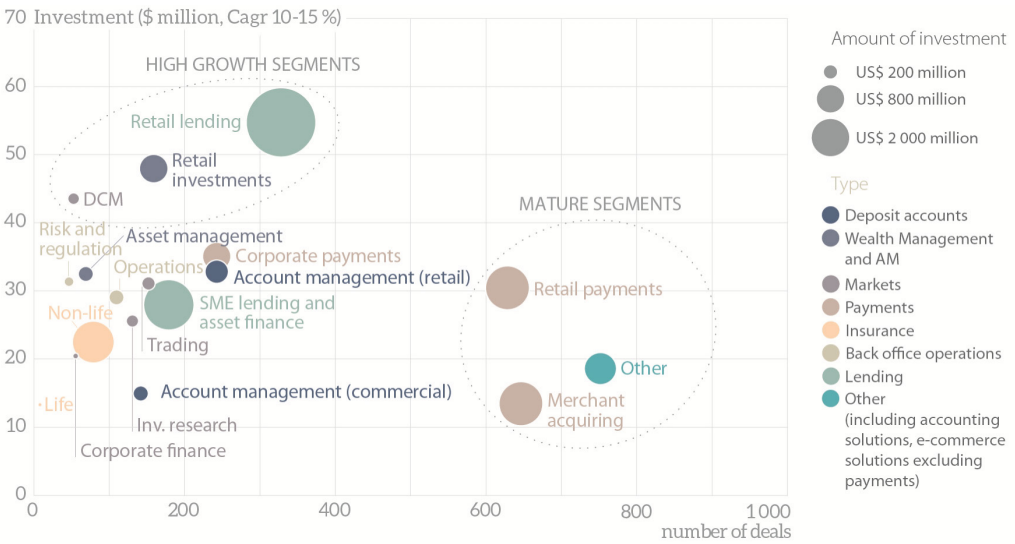
Chart no. 1. Global FinTech financing activity (2010-2015)



Source: Accenture, Fintech and the evolving landscape: landing points for the industry

In 2012, the number of P2P financial services operators rose from ten in 2010 to 11 in 2015, with annual growth of 61.8%. Moreover, there was a potential increase in channels including student loans and securitization of P2P credits. In 2020, industry revenue is projected to grow by 19.2% per annum to $ 1.7 billion.

Figure 2. Global FinTech financing activity by product segment, 2010-2015



Source: Accenture, Fintech and the evolving landscape: landing points for the industry.

In Asia, which is expected to account for 60% of the middle class by 2030, the market is growing fast, with rapid growth in FinTech and P2P.4 Since the late 1970s, China has, for example, from a mono-banking model to more than 80 banks and over 2,000 financial platforms that offer P2P loans. Unfair financial and capital markets have created opportunities for innovative alternative financial services; more, and the lack of physical banking infrastructure and less stringent data protection, as well as competition contributed to these developments. Consolidating China's position as one of FinTech's most important nations is already confirmed globally today: by the first quarter of 2012, there were € 1,089 billion recorded in China's third-party market and e-commerce market accounts.

As far as Europe is concerned, new technologies can also help to overcome barriers still hampering the full integration of financial market infrastructures, which is one of the factors on which capital market success depends. Possible benefits (DLTs) applied in the securities markets are listed in a consultative document of the European Securities and Markets Authority (ESMA). While consulting stakeholders on the potential benefits of DLTs, ESMA stresses the key risks associated with this FinTech technology and underlines that firms willing to use DLTs should be aware of the existing

regulatory framework at EU level (ESMA, 2015). The European Central Bank (ECB) also looks at possible DLT applications for post-trading activity. Recognizing at the same time the improvements that this technology could bring to different stages of the post-trading process, the ECB concludes, however, „Regardless of the technology used and the market actors involved, certain processes that feature in the post-trading securities market will still need to be carried out by institutions" (ECB, 2015).

In addition to their growing prospects, FinTech firms may pose threats to the profitability of traditional banks as a result of the opening of new financial markets and new financial options. The changes brought about by the digitization of financial markets, more FinTech firms provide services that have historically been the main business of commercial banks and a great source of earnings.

Moreover, by using remote control of financial services distribution channels, they have contributed to lowering the costs of accessing, distributing and managing financing sources (the costs borne by banks ,customers at the time of change), with a direct impact on banks' oligopoly, as well as their profits. Banks are actively reacting to these challenges, either by trying to reproduce FinTech firms' models (ie by setting up online lending platforms) or outsourcing some of their business processes to FinTech to take advantage of their greater efficiency.

FinTech financial technology regulations at EU level

The Single European Act (1986) and the Maastricht Treaty (1992) established the framework for establishing a single market for financial services in the European Union and one an increasing number of directives and regulations on financial services.

However, no single general legislation covers all aspects of FinTech. FinTech companies that provide financial services (for example, loans, financial advice, insurance, payments) should comply with the same legislation as any other firm that offers this service. Therefore, depending on the activity carried out (for example, payment services, crowdfunding, etc.), different laws, such as Directive 2000/31 / EC (electronic commerce), Directive 2002/65 / EC (distance marketing of consumer financial services), Directive 2009/110 / EC (electronic money), Directive (EU) 2015/2366 services), etc.(Karakas and Stamegna, 2018). However, the Payment Services Directive (PSD) deserves a closer look. PSD I (2007/64 EC) was adopted in 2007, introduced more EU

competition in the EU payment market and established the legal basis of the Single European Payments Directive (SEPA).

While SEPA has managed to harmonize the card and the bank-bank payment card, mobile and online payments have remained fragmented. In July 2013, the European Commission announced a new financial regulation package including the updated Payment Services Directive (Directive (EU) 2015/2366), called the so-called PSD II, which repealed PSD I, and a proposal for a regulation on interchange fees for card payment transactions (Regulation (EU) 2015/751). Michel Barnier, The Commissioner for the Internal Market and Services, at that time, justified the new rules by, inter alia, in fact, that the fragmented rules of the EU payment industry create costs more than 1% of EU GDP or € 130 billion a year. According to Barnier, the implementation of PSD II could stimulate the European economy, as the proposal wants „Promote the digital single market, making Internet payments cheaper and safer, both for retailers and consumers. The proposed changes to interchange fees will remove an important barrier between national payment markets and ultimately end the unjustifiably high level of these charges." PSD II entered into force on 12 January 2016. The deadline for implementation in national law is 13 January 2018. The new directive is designed to respond to the technological changes in the payment industry (Gheorghe, 2012). Its purpose is to make payments and money safer and less expensive transfers. At the same time, they are also addressing differences in the implementation of PSD I by Member States that are perceived as being distortion of competition.

Under PSD II, the definition of payment services was as well as the diversity of traditional payment service providers (PSP), such as banks and financial institutions have increased. Account information service (AISP) as well as providers of payment initiation services (GIS) (eg e-commerce payments) are all classified as third party service providers (PSCs) in PSD II.

Under the new directive, payment service providers are subject to the same rules as other payment institutions. Against this background, some experts argue that PSD II will balance the field and that FinTech's start-ups could make a disproportionate use of traditional payment stakeholders.

They also think this could be an „essential change" towards creating an open banking system. However, there are criticisms of PSD II. Serge Darolles of the Banque de France notes that access to bank account information raises the question as to who should pay for the infrastructure needed for such interconnectivity. The most important issue is security, because sharing and using customer identification details increases the threat of cyber attacks. If a

payment service provider is hacked, it can unintentionally propagate the attack on all its customers' banks. Thus, banks require stricter security regulations for newcomers, and raise concerns about the authentication systems they use. Since PSD II has some technical issues, stakeholders are awaiting clarification from the European Banking Authority (EBA) on the processes and data structures of communication between the parties (in line with Article 98 of the PSD II).

Data and consumer protection

Some experts argue that the current EU legislation on data protection, competition and consumer protection is clearly devoid of its definition of „big data", creating a on the spot, to be addressed. Here, the European Supervisory Authority (EFA) on Financial Issues is currently assessing FinTech's specificity, namely the application of the General Data Protection Regulation (GDPR) and/or other general provisions to consumer protection rules. With regard to data protection (in the sense of „protection of personal data"), the current Legal Framework is established by Directive 95/46/ EC on the protection of individuals with disabilities in relation to the processing of personal data and the free movement of such data . This will be replaced by Regulation (EU) 2016/679 on the protection of the environment of individuals with regard to the processing of personal data and the free movement of persons such data (General Data Protection Regulation). While the regulation entered into force on 24 May 2016, it is applicable from 25 May 2018. Its implementation is a key priority for the Commission. The website of the Directorate-General for Justice and the Consumer Commission provides more information and a useful overview of EU data protection reform.

Globally, the International Consumer Protection Organization (FinCoNet) is working on emerging consumer risks in the field of payments, and has recently published an online and mobile payments report. The report focuses on how regulators and supervisors address emerging risks, especially security risks, and keep up with the pace of innovation. FinCoNet also provides a forum for supervisors to engage and learn from others about how best to meet their challenges. In this context, FinCoNet identified (i) the digitization of high-cost credits and (ii) the practices and tools needed to support risk-based surveillance in a digital age process as two of its priority themes for the period 2017-2018 (Brummer, 2014).

In most countries, a consumer protection framework that can rely on the internal market (national / national codes), regional (European) directives

or international standards (OECD / G20 Principles) is already in place. Even when such frames are present, the OECD / G20 high - level principles on financial consumer protection, developed by the G20/OECD Task Force on Financial Consumer Protection clearly sets the key to consumer protection. The G20/OECD Action Group has identified FinTech is one of the key areas for review.

FinTech's laws and challenges for regulators

In general, there are two FinTech rules - based rules and rules basic principles. Rules-based rules create clear rules and processes, compliance obligations are clearly established, but this may limit the incentives for the supervised entity to do more because the obligations are perceived as sufficiently comprehensive. From a start-up perspective, this approach is often costly, as every rule and process needs to be identified and respected. Model-based principles are flexible, but could create a level of uncertainty as to what exactly compliance is expected to be.

Some experts argue that regulators should remain technologically neutral and concentrate on the outcome of technology.

Table 1. Regulations based on regulatory regimes

Rules-based regulatory regimes

Potential positives	Potential negatives
Certainty and predictability, including with respect to future enforcement	'Check-box' forms of compliance that strategically evade the underlying purpose of the regulation
Clear communication of steps for compliance	High internal costs of compliance
Ensures specific behaviour	Deterrence with respect to innovation
Uniform treatment of regulated entities	Frequent disconnect between the purpose of the regulation and the actual regulatory outcomes
	Obsolescence

Principles-based regulatory regimes

Potential positives	Potential negatives
Executive-level management involvement in incorporating regulatory principles into business models	Uncertainty and the risk of unpredictable post hoc application or arbitrage
Flexibility and innovation in the face of 'rapidly changing environments'	Concerns over fairness/bias in application
Speed in the regulatory process	Inadequate deterrence of specific problematic behaviour or activities
The centrality of guidance and evolving norms/best practices	Over-reliance on current norms and practices

Source: (Brummer and Gorfine, 2014)

Conclusion

As can be seen from the data of annex no.2, in most cases, $\alpha + \beta < 1$ which means the existence of decreasing yields. Moreover, with a one-percent increase in net fixed assets or labor costs, turnover increases by a%, respectively b%, i.e. by less than one percent. Instead, the increase by one percent of the total productivity factor (parameter A) ensures the increase of the turnover by more than 1%. Economic decision makers should consider this specific growth potential when assessing the likely impact of different economic policy measures.

- From what we know, for the first time in Romania, the calculation of the Cobb-Douglas model at the level of the significant sub-sectors of Romania's agriculture provides conclusive results that check all the usual statistical tests.
- The most dramatic conclusion resulting from the application of the model refers to the particular importance of capital (the technological level of machinery and equipment) that needs to be granted for economic growth, given that labor is becoming a rare resource for Romania.
- The contribution of unprompted technical progress (management and institutional efficiency of the economy) is still a factor with a very modest contribution to output growth, which is a challenge for the smooth functioning of our market economy in the future.
- Finally, but not least, the Cobb-Douglas production function could be a very useful tool for substantiating decision-making at different levels of economic aggregation, combining the static and dynamic analysis of the factors of influence considered, based on the hypothesis constant or variable substitution elasticity; of our research shows that the main part of this substitution is the cost of labor, supported by a higher technical endowment.

From the point of view of the sustainability of agricultural production in Romania, in the medium and long term, there is the problem of rising labor shortages and deficit coverage by measures to increase the capital contribution to the turnover. Or, this entails building an appropriate strategy to provide sub-sectors of long-term interest (agricultural sub-sectors with eco-production, for example), responsibilities for making important investments in agriculture (private investment, state aid, co- financial mechanisms to provide support to trigger an appropriate investment process. Further, the strategy should be

implemented consistently, irrespective of electoral cycles, in the economic policy mix, given the strategic importance of agriculture.

Financial health globally is an increasingly important phenomenon and has a direct impact on financial inclusion. Thanks to technological innovation, FinTech could bring banking services as close as possible to people as small entrepreneurs or small farmers, and as close as possible to their needs, contributing actively to the global financial inclusion of many non-bankers. At the international level, in April 2016, the G20 Financial Stability Board (FSB) began examining the potential risks that FinTech might pose to global financial stability. The FSB is currently conducting a mapping exercise focusing on the impact of digitization and FinTech on the banking sector and its possible implications for the banking sector, which is closely monitored. At the same time, there are attempts at the EU to collect the links between FinTech, information and data, and to explore how FinTech companies can tackle cross-border issues, such as taking over financial services and financial inclusion. In its first CMU status report, the Commission foresees a comprehensive assessment of European retail investment markets, including distribution channels and investment advice, in its CMU action plan by the end of 2018. The evaluation will there is a need to rely on expert input and take into account "whether retail investors can have access to products that are cost-effective and fair and whether the potential offered by the online services and other technologies that services have to offer (FinTech) are exploited The representatives of the European Commission have expressed their objective of understanding FinTech and its players better and assessing its impact on the banking and non-banking financial institutions sector and the financial services sector respectively of its current players.

References

Accenture. (2016). *Fintech and the evolving landscape: landing points for the industry.* Available at: https://www.accenture.com/t20161011T031409Z__w__/us-en/_acnmedia/PDF-15/Accenture-Fintech-Evolving-Landscape.pdf.

Brummer, C. and Gorfine, D. (2014). *FinTech: Building a 21st-Century Regulator's Toolkit*. Milken Institute – Center for Financial Markets.

Christen, R. and Anderson, J. (2013). "Segmentation of Smallholder Households: Meeting the Range of Financial Needs in Agricultural Families. Focus Note 85. Washington, D.C.: CGAP, April. Available at: http://www.cgap.org/

sites/default/files/Focus-Note-Segmentation-of-Smallholder-Households-April-2013.pdf.

ESMA. (2014). *Press release, Investment-based crowdfunding needs EU-wide common approach*. European Securities and Markets Authority, ESMA/2014/1568, 18/12/2014.

ESMA. (2015). *Automated Trading Guidelines: ESMA peer review among National Competent*, Authorities, ESMA/2015/592, 18 March 2015.

European Central Bank. (2015). *Virtual currency schemes – a further analysis*, February 2015. Available at: https://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemesen.pdf.

European Commission. (2016). *Capital Markets Union: First Status Report,* SWD(2016) 147 final, Brussels, 25 April 2016. Available at: https://ec.europa.eu/info/system/files/cmu-first-status-report_en.pdf.

Karakas, C. and Stamegna, C. (2018). *Financial technology (FinTech): Prospects and challenges for EU*. European Parliamentary Research Service (EPRS).

Manta, O. and Dimitriu, M. (2018). *Impact of the using Cobb-Douglas production function to determine the structure of production factors and the sustainability of the agricultural sector in Romania.*

Nicolescu, O. (2018). *Carta Albă a IMM-urilor din România, 2018*, ediţia a XVI-a, Consiliul Naţional al Întreprinderilor Private Mici şi Mijlocii din România (CNIPMMR).

Radu, Gh. (2012). *Methods and techniques of social research*. Bucharest: ProUniversitaria Publishing House, ISBN 978-606-647-561-7.

Radu, Gh. (2017). *General Sociology*. Bucharest: ProUniversitaria Publishing House, ISBN 978-606-26-0722-7.

Yaga, D., Mell, P., Roby, N., and Scarfone K. (2018). "Blockchain Technology Overview." Draft NISTR 8202. Gaithersburg, Md.: National Institute of Science and Technology, U.S. Department of Commerce, January.

Annex no.1

Number of firms in agriculture in 2008 - 2016

which meet the conditions for determining the Cobb-Douglas function

No. crt.	Subsectors of agriculture	Period								
		2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Cultivation of cereals (excluding rice), leguminous plants and oleaginous plants	3638	3603	3808	4071	4305	4556	4761	5222	5507
2	Cultivation of vegetables and melons, roots and tubers	274	280	304	350	381	378	367	391	435
3	Growing grapes	106	106	122	138	150	147	156	190	194
4	Growing fruit of berries, strawberries, nuts and other fruit trees	88	89	101	113	117	129	142	176	217
5	Breeding of dairy cattle	362	361	358	379	363	364	361	356	372
6	Pig breeding	158	203	236	274	296	272	291	293	294
7	Bird breeding	275	289	313	336	354	379	380	389	386
8	Activities in mixed farms (plant culture combined with livestock breeding)	536	552	557	591	619	627	649	681	716
9	Auxiliary activities for crop production	742	740	922	1197	1271	1265	1252	1230	1076
10	Forestry and other forestry activities	1232	1075	1022	1006	908	868	809	779	741
11	Forest exploitation	1228	1354	1447	1596	1689	1775	1828	1984	2041
12	Marine aquaculture and freshwater (321 + 322)	211	236	253	262	276	303	311	311	333
13	Total 1-12	8850	8888	9443	10313	10729	11063	11307	12002	12312
14	Total companies in agriculture	9835	9763	10297	11178	11594	11953	12242	13003	13399

Source: own processing

Annex no.2

Evolution of the parameters of the Cobb-Douglas function for some sub-sectors of Romanian agriculture in the period 2008-2016

No crt.	Subsectors of agriculture	vari-able	Period								
			2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Cultivation of cereals (excluding rice), leguminous plants and oleaginous plants	A	3.503355	3.142805	3.910642	4.074577	4.123317	4.233467	4.351747	4.295940	4.070652
		α	0.269352	0.272219	0.254042	0.282997	0.298516	0.309074	0.293882	0.253938	0.255526
		β	0.578863	0.602622	0.573380	0.544053	0.519323	0.497604	0.503639	0.546969	0.565031
		α + β	<1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.766547	0.779036	0.760644	0.767691	0.771068	0.781150	0.778675	0.790400	0.799040
2	Cultivation of vegetables and melons, roots and tubers	A	2.436544	1.883064	2.450426	2.471397	2.750117	3.169149	2.430731	2.158436	3.320117
		α	0.219743	0.256507	0.266858	0.285863	0.172113	0.186825	0.170336	0.154885	0.161084
		β	0.679135	0.685827	0.625878	0.600952	0.705980	0.656617	0.739084	0.785656	0.671591
		α + β	<1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.700926	0.726046	0.656892	0.726003	0.695711	0.716214	0.720009	0.752571	0.742566
3	Growing grapes	A	2.392759	2.582836	3.502915	2.588047	1.190263	2.032747	1.562855	2.872166	2.151918
		α	0.081389	0.044069	0.100635	0.140219	0.011801	0.191150	0.183983	0.122553	0.108900
		β	0.798604	0.827594	0.696108	0.714892	0.985731	0.707561	0.742807	0.717629	0.788263
		α + β	<1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.736705	0.741183	0.760141	0.691066	0.702276	0.754673	0.799688	0.776608	0.819126
4	Growing fruit of berries, strawberries, nuts and other fruit trees	A	2.374139	2.978044	3.530354	3.865454	4.130157	4.649408	4.962325	3.289892	3.207984
		α	0.113226	0.090040	0.339975	0.219003	0.083878	0.039245	0.084432	0.058040	0.083374
		β	0.782938	0.724150	0.404934	0.513990	0.642437	0.647724	0.550886	0.739158	0.709978
		α + β	<1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.650478	0.666831	0.693044	0.705171	0.651256	0.595805	0.601513	0.609416	0.633171
5	Breeding of dairy cattle	A	3.331285	2.601502	3.669957	3.053176	2.888068	2.979584	2.026778	1.896132	1.851829
		α	0.278963	0.304162	0.345343	0.254872	0.251597	0.222484	0.190816	0.233280	0.255339
		β	0.556815	0.578152	0.437362	0.611180	0.624408	0.653482	0.781474	0.734544	0.702822
		α + β	<1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.766330	0.786609	0.751651	0.788743	0.790780	0.787557	0.822965	0.834312	0.804027
6	Pig breeding	A	1.519984	1.677368	2.407314	2.699576	2.398304	3.501806	2.680236	3.023193	2.528730
		α	0.367902	0.486112	0.400810	0.219192	0.335196	0.303675	0.237418	0.302782	0.193244
		β	0.644210	0.503439	0.539659	0.750424	0.640379	0.599265	0.737615	0.625802	0.789763
		α + β	>1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.827592	0.807704	0.797661	0.787018	0.759258	0.763128	0.773065	0.759161	0.804566
7	Bird breeding	A	3.047636	3.003382	3.364928	3.523115	2.279362	1.341092	2.405400	1.772141	1.931592
		α	0.260984	0.135266	0.201215	0.186883	0.147702	0.126296	0.126173	0.052565	0.102308
		β	0.658638	0.813702	0.694707	0.705156	0.858114	0.948334	0.869768	0.999281	0.924289
		α + β	<1	<1	<1	<1	>1	>1	<1	>1	>1
		R	0.855934	0.826673	0.828454	0.781087	0.821482	0.806556	0.831777	0.852176	0.869961

Annex no.2 - continued –

Evolution of the parameters of the Cobb-Douglas function for some sub-sectors of Romanian agriculture in the period 2008-2016

Nr crt.	Subsectors of agriculture	Variable	Period								
			2008	2009	2010	2011	2012	2013	2014	2015	2016
8	Activities in mixed farms (plant culture combined with livestock breeding)	A	2.764225	1.728132	2.487053	2.285855	3.058836	2.187890	2.335240	1.882091	2.188075
		α	0.218919	0.258754	0.272044	0.213373	0.242791	0.214695	0.271824	0.186147	0.253572
		β	0.674360	0.711472	0.636812	0.735580	0.633587	0.742126	0.662557	0.794955	0.686388
		α + β	<1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.749751	0.799107	0.760161	0.745319	0.733464	0.750872	0.786138	0.783564	0.792130
9	Auxiliary activities for crop production	A	2.616150	2.363838	3.030756	4.803998	4.895449	4.284594	3.896002	3.475820	1.960113
		α	0.380473	0.325464	0.197000	0.177316	0.150695	0.190080	0.192824	0.184818	0.233449
		β	0.501114	0.584058	0.660610	0.506703	0.528193	0.537568	0.571769	0.607348	0.700365
		α + β	<1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.701209	0.720815	0.646643	0.522841	0.547120	0.550565	0.582812	0.581394	0.647573
10	Forestry and other forestry activities	A	3.645020	3.462687	3.895880	3.706681	3.833022	4.183467	3.744406	3.940362	3.755674
		α	0.260118	0.232481	0.228278	0.193797	0.230976	0.191238	0.143722	0.117104	0.108523
		β	0.577677	0.610245	0.579115	0.636290	0.585539	0.600445	0.686290	0.692726	0.714351
		α + β	<1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.776865	0.784756	0.752763	0.781790	0.773606	0.775863	0.806315	0.788355	0.829097
11	Forest exploitation	A	3.117888	3.044019	3.252671	3.463774	3.248451	3.102388	3.021757	2.980746	2.187519
		α	0.246246	0.232286	0.244850	0.191510	0.182757	0.191501	0.149097	0.162104	0.158310
		β	0.650494	0.660365	0.644690	0.684926	0.710921	0.719811	0.771990	0.760624	0.825641
		α + β	<1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.823749	0.785400	0.796665	0.805819	0.785454	0.789368	0.808820	0.804317	0.819590
12	Marine aquaculture and freshwater	A	3.216120	2.547377	3.028152	3.401658	3.648661	4.111378	4.161632	4.171734	3.129802
		α	0.225283	0.061814	0.134544	0.242304	0.160370	0.077330	0.077797	0.055169	0.016612
		β	0.580602	0.796138	0.678487	0.521950	0.596114	0.627863	0.622543	0.669984	0.800460
		α + β	<1	<1	<1	<1	<1	<1	<1	<1	<1
		R	0.723352	0.645095	0.702384	0.610778	0.656898	0.592372	0.532784	0.598716	0.692872

Source: own processing

A - proportionality factor;
α - the elasticity of the turnover figure relative to net fixed assets;
β - the elasticity of the number of factions in relation to the workforce;
R - multiple correlation coefficient.

ISSN 2065 - 8168 (print)
ISSN 2068 - 2077 (online)