

# INTERNAL AUDITING & RISK MANAGEMENT



YEAR XIV, No. 2 (54), JUNE 2019



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# **INTERNAL AUDITING & RISK MANAGEMENT**

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Centrul de Excelență în Managementul Financiar și Audit Intern**

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## **THE ROLE OF INFORMATION SYSTEMS IN ECONOMIC ORGANIZATIONS FOR THE STRATEGIC MANAGEMENT**

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**Abstract:** *The paper presents the role of information systems in economic organizations for the strategic management. The leadership of the modern enterprise is no longer satisfied with operative information but wants forecasts, wishes to anticipate future competition movements and the future evolution of the market taking into account what is happening today. That's why even if we do not design decision-support systems, modern computer systems have to come out of the company's perimeter. The IT system detaches itself from the enterprise and even comes out of it by making a direct connection with banks, suppliers and providing leadership with information about the movements that competition is doing. Achieving good economic efficiency by businesses is conditional on the existence of a scientific leadership based on good knowledge of economic laws, the operative and accurate knowledge of supply and demand on the internal and external market, the dynamics of commodity prices, technological trends and the way to use the resources they have. The strategic management wants to use the benefits of a robust information system to take the best decisions for the organizations. The IT system provides data from the operational level and is processing and aggregating the complex economical indicators to give the proper support to the decisional system lead by the top management.*

**Keywords:** *Information systems, business logic, IT systems, programing logic, informational support, mission-critical softwares, business decisions*

**JEL Classification:** C23, C26, C38, C55, C81, C87

## 1. Introduction

The fact that, on the one hand, mathematical models represent the scientific component of an information system, and on the other hand, taking into account the facilities offered by the use of information and communication technology (ICT) as a component of the information system, This is a real instrument in the scientific leadership of economic activity.

An organization must maintain appropriate relationships with other economic, political and social systems in its environment. The system group includes several factors such as customers, suppliers, competitors, shareholders, syndicate unions, financial institutions, government agencies and communities, each with its own objectives relative to the organization in question. Information systems are those that facilitate the interaction between the organization seen as a system and each of the listed factors.

Within the information process, the stages of the formation of economic information are carried out: collecting data from the direct productive process of the economic system, verification and transmission for the actual processing (regardless of the technical means), the formation of the economic information and its archiving (O' Brien & Marakas, 2017; Allen, 2016).

Some of the phases of the information process (eg collecting primary data) are carried out within the operational (driven) subsystem of the economic system. It can be appreciated that the subsystem in which the information process takes place together with a part of the operational subsystem forms the driven subsystem of the informational cybernetic system. The main role of the informational subsystem led is to provide information for the management of the whole economic system, for the functioning of the information system and for keeping it within predefined limits (Coleman, Pigman & Pulak, 2015; Swanson & Ramiller, 2016).

The second element of the information system is the managerial process of the system, which is based on specific management methods, similar to the management of the economic system as a whole. The management information subsystem has a special role, receiving information and requirements on the one hand, and on the other hand, passing on decisions. The information

requirements they receive aim to maintain and ensure full consistency between the economic system and the information system that characterizes it. The requirements are like creating new information, abandoning information that is no longer needed to drive the economic system, improving methodologies and for calculating indicators.

## **2. The IT system and the business components**

The dynamic nature of the economic system necessarily determines the dynamics of the economic information system. Initially, variations in the behavior of the economic system may be perturbations for the information system, but due to its existence as a cybernetic system, the information system can adapt and function in full compliance with the economic system. The cybernetic character of the economic information system results from the fact that it has the ability to self-regulate, so it reflects and is always consistent with the economic system that it describes, characterizes and serves.

In this context one can define both the information system in general and the economic information system.

The informational system is a technical and organizational ensemble to conceive and obtain the information necessary to substantiate the decisions for the management of a certain field of activity (Gordon & Miller, 2016; Alter, 2016).

Here are some of the arguments put forward in favor of leading economic organizations using computer systems:

- SI offers the opportunity to simulate processes and economic phenomena at both microeconomic and macroeconomic level. Mathematical models for forecasting the development of the economy can be developed and implemented, different plan variants can be developed and then the optimal option can be chosen.
- At the microeconomic level, SI is harmoniously correlating the available resources with the proposed objectives. (Eg planning for capital revisions and repairs, order planning and production tracking, inventory management).
- through SI it is possible to implement the principle of selection and information by exception. By applying this principle it is ensured that decision makers are relieved of a series of data that are often „suffocating” and can not be used properly. Ex: We have a 15,000-item

and 15,000 item list of supplies - the idea is to only highlight products that deviate from the normal state (stocks outside the lower and upper alarm limits) in order to avoid breakage inventory or fixed assets assets - supernormal stocks.

- The higher the level of driving, the smaller the set of indicators and the indicators are more complex. Under the exception and selection principle, only those indicators that are necessary and sufficient for each decision level need to be selected.
- SI assures the implementation of a multitude of mathematical models and, as a result, will imply an increase in economic efficiency at the level of the reference unit. Ex: In the field of foreign trade it is possible to implement models regarding foreign market prospecting, correlation of export task with domestic production, calculation of economic efficiency on each commercial transaction, choice of optimal offer.
- By implementing the SI, labor anacronism is removed. For example, about 70-80% of the technical and civilian staff is used for routine activities (finding, recording, centralizing data on economic processes and phenomena) leaving too little time for control, analysis, forecasting and control activities . Due to SI usage, decision makers will have more time to analyze data and make the right decisions.

At micro and macroeconomic level, the design of computer systems should consider the use of databases, mathematical models, obtaining final situations with a pre-warning character of deviations from the normal state, all representing a scientific form of leadership. This conception changes the entire information system, transforming it from a passive instrument of finding, recording and analyzing already existing phenomena and processes into an active predictive, command and control tool.

Reporting systems provide managers with information that greatly supports decision-making needs by accessing databases with information about internal operations previously processed by transaction processing systems. The data on the business framework is obtained from external sources. Information accessible to managers includes reports provided on request, periodically - according to a predetermined schedule or under exceptional circumstances. For example, sales managers can access instantly generated reports in response to a request to analyze the sale of a particular product, weekly sales analysis reports to evaluate the results of product sales, agents

and sales areas or automated reports generated by each or a sales agent does not get the expected sales results over a specified period.

### **3. Development of information systems components**

In the development of a computer system one can choose one of the following solutions: a centralized computer system and a decentralized computer system.

The centralized computer system is characterized by the fact that the entire process of data storage and processing, as well as system development, takes place at a single location where there is a single computing system, usually a mainframe that 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 between 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 services requested by users through the power of the central system (mainframe).

The disadvantages of centralization are the following:

- the „fall” of the computing system blocks all users;
- Alteration of data and programs, willful 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 for simultaneous requests from multiple users.

The decentralized computer system is characterized by the fact that the data, software and the power of calculations are dispersed in different locations (even geographically dispersed) of the organization. The processing is done on independent personal computers or within local networks (Allen, 2016; Gordon & Miller, 2016).

Advantages of decentralization:

- data is stored and processed locally;

- software is better suited to local needs;
- Hard, soft or database damage at a location does 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:

- large risks of 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 compared to the centralized system.

The current trend is net-oriented towards decentralization, which must be achieved 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 level of the organization;
  - communication management within the organization's local network;
  - data management;
  - disaster recovery.

The architecture promoted in decentralized systems is the client-server architecture characterized by the fact that the applications and data made available to the users are dispersed on the different hardware depending on the number of users to access and the required computing power.

The design and optimization of the banking information system has to be carried out on three levels certain:

1. Decisional (management level).
2. Datawarehouse & Reporting (management level). At this level, the defined data structures allow a high level of performance of multiple requests. Every bank has multiple information about its customers. But this information is dispersed, managed by various applications.

Datawarehouse is a collection of detailed, high-value data from all relevant sources within the bank, enabling dynamic querying and analysis of information to support decision-making processes. This makes it possible to know the preferences regarding products and services, the behavior and the needs of the client. Data mining tools (assemblage of knowledge-based engine techniques - decision trees, neural networks - allowing large data volumes to be constructed, predictive models) allow for the discovery of significant trends or correlations by analyzing current data and historical customer reviews. The multidimensional analysis tools the datawarehouse provides for allows browsing through stored information and identifying the most complex and hidden correlations. They can be based on advanced technologies such as multidimensional databases, allowing data to be matched even on five analysis axes, with the possibility of successive focusing on the desired indicators.

**3. The front-office / back-office.** The client's relationship with the bank is done through the front office using phone support, paper, e-mail or web mail. The front office is the user interface. Call centers were the first front office solutions - based solely on telephone communication. These issues also apply to companies that have developed computer systems that support e-commerce as a direct, immediate, and personal relationship with the customer. Bank employees take customers' calls, answer questions, update their accounts, offer products and services. Today, the possibility of communicating using the Internet - via e-mail and web - has been expanded. Thus, multiple communication channels are available to customers: paper-based mail (still essential for back-office), fax, e-mail, web, telephone. The role of call centers has evolved and expanded. They have become competitive weapons in attracting new customers, keeping existing ones and increasing the bank's revenue. Their new goal, nowadays the customer interaction center, is to personalize the relationship with each client of the bank (O' Brien & Marakas, 2015; Swanson & Ramiller, 2016).

The key to reaching this new mandate is customer knowledge. This implies, on the one hand, the identification of the best customers and the provision of irreproachable services, knowing that 20% of the clients (the so-called gold customers) provide 70-80% of the bank's income. On the other hand, it is necessary to know the relationship in time with the client so that each contact with it represents a business opportunity (offering a new product or

service). This customer knowledge can be achieved by creating and using a data warehouse that stores information about customer transactions, products and services that they prefer, information on which to get a „portrait” and a description of customer behavior in relation with the bank. Interaction with the customer has evolved very dynamically in recent years. Today, when a customer calls the bank, smart switches called Automatic Call Distributors (ACDs) identify the caller, the software retrieves customer information and sends them to the employee of the receiving bank. Call routing technology applies customer defined bank management rules, identifying „gold customers”, type of service requested, and employee of the bank (specialist in credit, forex, portfolio management, etc.) who need to take the call. In fact, the first call-to-call contact is made by the Voice Response Unit to determine the identity of the customer and the type of request.

The Middle Office is a distinct entity placed between the front and back office, allowing two-way data circulation between these two components. Middle office behaves like a router in terms of processing. Its main function is to transmit front office data (from various sources and thus multiple formats) to the back office. Middle office retains two separate data images:

- one corresponds to the front office that takes the data into their „native” format determined by the client’s channel of distribution;
- records returned by the back office after data storage and processing.

Middle office therefore provides the platform for data reconciliation and reporting, while ensuring the control of data management risk. The risk is determined by obtaining data from a large number of other computer systems. Often these data are in different formats, from different databases, running on different hardware platforms and under different operating systems. This is why a lot of data extraction and „understanding” problems can arise due to the different format it presents. Data storage and processing is done in the back office, the place where TPSs are executed (transactional processes). Back office is the one that provides the front office with the requested information as a result of the fact that the applications and the database are here. An important issue is the realization of an integrated front office / back office solution that will allow, besides offering a multitude of communication channels to the client, routing customer calls to bank specialists and managing back office processes to meet customer demands (Coleman, 2015; Alter, 2016).

The new IT solutions implemented within the Banking SI have led to a real change in what we call organizational culture. New concepts such as groupware and workflow have been promoted.

The workflow aims to automate information (secure documents, images, composite documents) between different workstations. It is an interactive system that assures the development, execution, analysis and operational management of multi-user and multitask processes.

Groupware is a concept that promotes the idea of cooperative work using the intranet communication facilities.

Designing a new banking product requires cross-cutting and complementary skills. The intranet facilitates parallel work and interactivity between the different people involved in a project, providing them with the communication infrastructure needed for optimized exchange. Not least interest is the services the intranet offers: e-mail, file sharing, electronic forums, Internet browsing tools.

Electronic Document Management involves defining management rules and methods established prior to the implementation of the systems (Gordon & Miller, 2016; Allen, 2016).

### ***The general structure of an IT management system***

In order to define the general structure of a computer system, it is necessary to depart from its function of processing the available data in order to obtain the necessary information for the decision making in the management process.

The three major components of the IT system are:

- Entries
- Processing
- Outputs

Entries represent the set of data uploaded, stored, and processed within the system to obtain the information.

Entries are classified into two groups, namely:

1. External transactions reflecting the dynamics of economic and financial operations and processes within the firm. They come from the outside of the computer system. There are external transactions: data on raw material supply, data reflecting cash and payment operations and so on Internal transactions are represented by:

- Data recorded in primary documents at the place of production of the operations he / she highlights within the firm (eg a consumer bill, an invoice issued to a customer, etc.);
- Data coming from the economic-financial-banking environment, recorded in documents or written in norms and / or legal provisions (invoices received from suppliers, payment order honored by the customer, legal VAT rate, profit tax rates etc.) ;
- Data coming from other operating systems within the same company.
- Data from other IT systems outside the company.

The data recorded in the documents will be entered into the computer system in the following ways:

- Performing specialized computer system procedures allowing data uploaded by the operator based on data collection models generated on the computer monitor and data validation;

- Document scanning, state-of-the-art optical technology, allowing very large data collection over a short period of time.

Entries can be made directly using modern TI means such as:

- Data transfer via the local network within the company, a Novell network, for example, or the intranet, thus making the outputs of a company's IT subsystem into inputs for another subsystem;

- Remote Data Transfer:

- Through the Internet, including the use of Electronic Data Interchange (EDI) technology;

- Through private networks - MICR (Magnetic ink character recognition) documents are completed using stylized characters written with magnetic ink reading documents through specialized equipment:

- Magnetic tape cards
- Smart cards
- Bar codes
- Voice recognition
- Digital cameras
- Touch screens.

Internal transactions are the result of automated processing within the IT system leading to structural changes in data collections. Examples: total value of delivered products, total amount of receipts, etc.

The processes, the second defining element of the computer system, represent a homogeneous assembly of automatic procedures, realizing:

- Initial creation and updating of the database
- Exploiting the database
- Reorganize the database
- Saving / restoring the database.

Outputs of the information system are represented by the results of the processing carried out. These outputs, depending on the nature of the processing that generated them, are of two categories:

- Outputs resulting from data transfer operations that have not changed their value since the time they were placed in the system. For example: the number and date of an invoice, the name of a product, the quantity invoiced, etc.
- Outputs obtained from some calculation operations based on predefined algorithms (invoice value, total invoice, sales value per month ... etc). Outputs of the IT system may be classified according to their content and form of presentation in:
- Synthetic indicators found in on-board dashboards that can be consulted on-line;
- Reports (situations) that group various synthetic or analytical indicators in tabular form. Example: Paying State, Stock Status of Finished Products and Synthetic Balance.

Either two files organized sequentially, with data on taxes due to the state on the radius the second financial administration. The articles have the structure:

```
ID_contributor char[13]
Name_and_surname char[30]
Address char[50]
```

Annual tax on buildings and land, calculated float

– Annual tax on buildings and land, paid float

– Considering the files sorted by the amount of the calculated tax, write one program for entering data.

The following application program will manage the calculated tax:

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

struct contributor {
    char id[13];
    char name[30];
    char adress[50];
    float ic,ip;
};

void main()
{
    FILE *f;
    contributor x;
    char name_f[20];

    printf("\nName of file: ");
    gets(name_f);
    fopen_s(&f,name_f,"wb");
    if(!f)
        printf("\nFile %s can't be open",name_f);
    else
    { fseek(f,0,SEEK_END);
      printf("\nID (sau CTRL_Z): ");
      fflush(stdin);
      gets(x.id);
      while(!feof(stdin))
      { printf("\Name and surname: ");
        fflush(stdin);
        gets(x.name);
        printf("\Adress: ");
        fflush(stdin);
        gets(x.adresa);
        printf("Calculated TAX: ");
        scanf("%f",&x.ic);
        printf("Paid TAX: ");
        scanf("%f",&x.ip);

        fwrite(&x,sizeof(contributor),1,f);
```

```
        printf("\nID (or CTRL_Z): ");
        fflush(stdin);
        gets(x.cnp);
    }
    fclose(f);
}
printf("\n End of program!");

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

For the file generated in the previous program write a program that generates in a text file a list of taxpayers (taxpayer) with the highest unpaid debt.

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

struct contributor {
    char id[13];
    char nume[30];
    char adresa[50];
    float ic,ip;
};

void main()
{
    FILE *f,*g,*h;
    contributor x;
    float max;
    char name_f[20];
    int poz;

    printf("\nName of file: ");
    gets(name_f);
    fopen_s(&f,name_f,"rb");
    if(!f)
        printf("\nFile %s can't be open",name_f);
    else
    {
        fopen_s(&g,"temporar.dat","wb");
```

```
fread(&x, sizeof(contributor), 1, f);
max=0;
while(!feof(f))
{ if(max<(x.ic-x.ip))
  { max=x.ic-x.ip;
    poz=ftell(f)/sizeof(contributor)-1;
    fclose(g);
    fopen_s(&g, "temporar.dat", "wb");
    fwrite(&poz, sizeof(int), 1, g);
  }
else
  if(max=(x.ic-x.ip))
  { poz=ftell(f)/sizeof(contributor)-1;
    fwrite(&poz, sizeof(int), 1, g);
  }
  fread(&x, sizeof(contributor), 1, f);
}

rewind(g);
fopen_s(&h, "List_contr.txt", "w");
fprintf(h, " The list with the highest unpaid debts:
\n\n");
fprintf(h, "\nMaximum debt este %10.2 Euro", max);
fprintf(h, " unpaid by the following taxpayers: \n");

fread(&poz, sizeof(int), 1, g);
while(!feof(g))
{ fseek(f, poz*sizeof(contributor), SEEK_SET);
  fread(&x, sizeof(contributor), 1, f);
  fprintf(h, "\n%13s %30s %50s", x.id, x.name, x.adress);
  fread(&poz, sizeof(int), 1, g);
}
fclose(g);
fclose(h);
printf("\nList is in file List_contr.txt");
remove("temporar.dat");
fclose(f);
}

printf("\n End of program!");

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

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.

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. Improve data organization in external memory by implementing a better performance model. It aims to increase the logical and physical independence (up to the total), to provide the most efficient and automated data description languages, to provide powerful data manipulation languages, to provide non-procedural retrieval languages, reduction and control of redundancy (Gordon & Miller, 2016; Alter, 2016).

#### **4. Conclusions**

The overall objective of a program is to provide complete software support for the development of computer applications with databases. Being a specialized environment, the software meets the user's information requirements in an optimal way. Thus, it minimizes the cost of data processing, reduces response time, provides flexibility and openness to the application, ensures high data protection. (O'Brien & Marakas, 2016; Gordon & Mileer, 2016). A system is a set of interdependent elements and components between which a dynamic interaction is established based on predetermined rules in order to achieve a certain objective. The dynamic interaction between elements materializes in the flows established between them, flows involving the existing resources (O'Brien & Marakas, 2016; Alter, 2016). The multitude of organizational components and the interaction between them aim at achieving a certain global goal that is that an operating the company in optimum conditions or achieving goals. The software programs improves automatization and optimiuization of all processes existing in every organization. The IT systems provide the optimal solutions for the strategic management by processing existing data and agregating for the important economic indicators.

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## FUNDING MODALITIES A COMPANIES AT NATIONAL AND EUROPEAN LEVEL

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**Abstract:** *Whether we are discussing ways of financing at national or European level, doing business at the level of a company generates important financing needs related to the exploitation cycle, as well as development, restructuring or modernization activities. For their funding, internal and external resources can be used. As a rule, investment activity is the most important “consuming” of external resources. As the company has more possibilities to finance its business, it is a question of choosing the ones that best fit its needs. This selection is made taking into account certain conditions limiting the scope of resource procurement. Long-term resource needs can be met by appealing to the banking system, the capital market, specialized firms or the state. Since these resources are part of the permanent capital, being found in the company’s financial mechanism for a long period of time, a proper substantiation of the financing decision is required. In this respect, the ratio between leverage finance and equity must provide the lowest funding cost, with funding decisions based on optimizing the proportion of the funding source, allocation and use of funds, and obtaining future financial surpluses that will allow reimbursement lending and business development. Establishing a financial structure is an important decision that is included in the company’s financial policy. Thus, it is necessary to decide how to allocate funding between short-term debt and the use of permanent capital. Moreover, we are currently witnessing a great deal of challenges in how to finance a company, funding using digital technologies is one of the most current ways.*

**Keywords:** *financing, sustainability and business development*

**JEL Classification:** *F17, G23 and O31*

## **Introduction**

The analysis needs to be deepened on the structure of permanent capital, making it necessary to choose the proportion of equity to borrowed in the medium and long term. the financing decision must be based on leverage, the level of financial profitability, the type of financing needs, the cash-flow forecast for the upcoming period. However, the fact that the financing decision is also subject to the influence of the evolution of some indicators macroeconomic: inflation, interest rate, exchange rate, GDP but also fiscal and legislative components.

## **Research methodology**

In order to underpin research methodology, we used classical observation and examination instruments, research methods based on the basic principles of scientific research. Procedures based on factual analysis, intensive documentation at the level of internal and international literature have been used, using the existing databases and scientific material in endowing the libraries of specific institutes in Romania and internationally (Manta 2018a).

The methodology of the research paper has as a direct instrument 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 (ResearchGate, Academia.edu, etc.), published articles in various journals, relevant books in the field of reference, legislation, analyzes and studies, official documents of various tax bodies, fiscal documents and interactive database of the National Bank of Romania, other relevant sources identified in the libraries: CCFM, Romanian Academy, INCE, IEN, BNR, National Library, INS, etc. Moreover, in the methodology we analyzed the documents using the comparative, analytical, descriptive method, the nonparticipative and participatory observation, the use of a set of information sources, the collection of financial data in the established databases. Also, the paper was based on annual reports, publications, consolidated statistical data provided by the European Commission, the National Bank of Romania, the European Central Bank (ECB), the International Settlement Bank (BRI), the European Commission, OECD, published annually. have been processed in order to be able to offer an overall and analytical picture of the most important changes taking place in the European Union as a whole but also globally -

considered to be representative of the understanding of the phenomena studied, and especially in Romania (Manta 2018b).

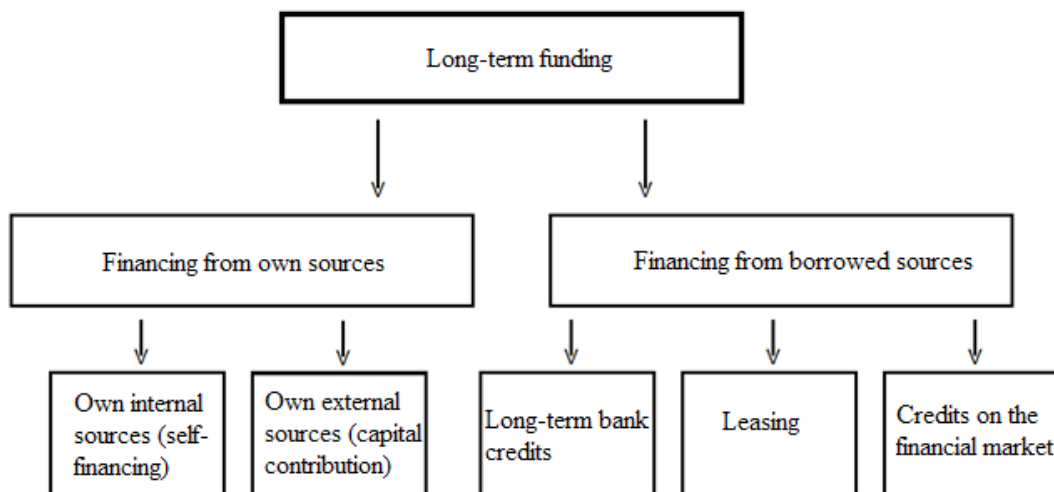
## Research results

Improving the methods and tools for selecting funding means appropriate to the needs of the entity put together four types of financial resources (Vasile 2006):

- Self-financing;
- External financing through participation in the company's equity;
- External financing through loans or credits granted to the company;
- Lending between businesses / commercial credit.

In general, long-term funding can be described schematically in the following figure.

**Figure 1. Long-term financing of the firm**



*Source: own processing*

Firm financing from internal sources depends on the amount of depreciation and provisioning, calculated and not yet consumed, by the amount of unpaid profits, and by the size of disinvestment revenue. Since depreciation is a tax deductible expense, it results that the tax savings thus achieved significantly reduce the cost of self-financing.

Self-financing is the basis for any company development (Vasile, 2006). It is the most widely known form of financing for economic agents and requires the entity to provide its own development, using as a source part of the profit obtained in the previous year and the amortization fund. It aims to cover the need to replace fixed assets, but also to increase operating assets.

*In a market economy the main advantages of self-financing are* (Sandu 2000):

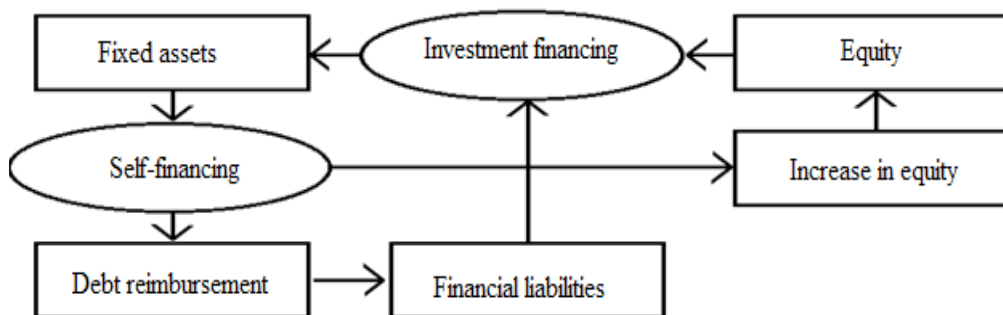
- is a safe means of financing, given that in some situations the firms face difficulties in collecting capital on the financial and monetary market.

- defends the company's freedom of action in the sense that the financial autonomy gained through self-financing allows it the independence of management from financial and credit institutions, bodies that exercise rigorous control to ensure the guarantee of the recovery of the loan capital.

However, self-financing has a number of limitations, due to the fact that any other financing category of the firm outside self-financing is in fact based on the expectations of creating a future self-financing capacity. These limits are expressed by the fact that some firms may have a high self-financing capacity but do not need large financing, while other firms face the reverse phenomenon (Sundararajan 2007). For this reason, self-financing does not ensure a real meeting between funding capacity and funding needs, which, in the national economy, can cause some imbalances. In addition, self-financing capacity may be highly fluctuating over time, often for reasons not attributable to the firm in question, but to the economic environment in which it operates.

From a dynamic point of view, the accumulation cycle of the firm's money resources from which self-financing will be fed can be described in the following figure.

**Figure 2. Cycle of accumulation of firm's money resources**



*Source: own processing*

Self-financing (AF) has two components:

- a) self-financing of maintenance (AF<sub>m</sub>);
- b) Growth self-financing (AF<sub>cr</sub>):

$$AF = AF_m + AF_{cr}, \text{ where: } AF_m = Am + Pr, \text{ where:}$$

*Am* represents the depreciation (gradual extinction of long-term credits, successive payments or redemption of claims); creation of the funds needed to replace the physical and moral wear and tear of fixed assets owned by a firm in kind (through repairs and capital construction) they transmit their value on the value of each product unit.);

*Pr* are the provisions (percentage remuneration due to the one who commits a commercial business, draw, commission)

$$AF_{cr} = B_{nd}$$

where with  $B_{nd}$  the value of the undistributed profit in the form of dividends was noted (Dobrota & Chirculescu, 2009).

*Share-capital increase through equity* is a form of self-financing as well as self-financing. The difference lies in the fact that while self-financing is an internal financing achieved through the company's own effort, capitalization of a part of the profit - the capital increase through the issuance of new shares represents financing from external sources, funds from outside the company by actual or potential shareholders. From this point of view, capital increases through equity issuance resemble debt financing (Dobrota & Chirculescu 2009). The issue of shares leads to the increase of the company's money, to the increase of its solvency, to the strengthening of the working capital and thus to the strengthening of the financial equilibrium as the increase of the capital permanently determined by the increase of the share capital is not immediately accompanied by an increase of the immobilized assets of the working capital is transient (characterized by the change over time) because afterwards these funds will mostly be invested in immobilized assets).

Subscription to shares has a contradictory, dilutive effect on the firm's valuation by investors: on the one hand, it has a negative effect on the profitability of the company's shares because the overall net profit realized will be distributed over a larger number of shares, so the profitability of an action decreases and, on the other hand, has a positive effect, as the creditworthiness and guarantee of the firm grows due to the increase in equity, which may

require additional credits. The capital increase can be done by issuing new shares by distributing free shares by increasing the nominal value of the old shares (the third alternative is less frequently used). The issue of new shares can be done in two ways: - at the nominal value of the old shares; - at a higher value, depending on the market value of the old shares.

Although the increase in share capital may not only result in the subscription of new contributions but also in the incorporation of reserves or debts converted into contributions to the share capital, only the creation of new contributions to the share capital contributes to the financing of the net investments, the other sources being only conversions a (state) loan issued earlier, in the sense of changing the amount of the interest, the extension of the payment term, the merging of several previous loans, etc.

The capital increase through the issuance of new shares can only be achieved when the old subscribed capital has been fully paid. In order for the issue to be practically achievable and attractive, the issuance price of the new shares issued should be lower or at most equal to the market value of the old shares.

*Financing by bank credit* (Dobrota & Chirculescu, 2009). Bank credits are contracted for periods of time established by the contract between the banking institution and the applicant for well-defined purposes. They are generating costs in the form of interest and bank charges that can be paid monthly, annually, at the end of the period or at the time of contracting (commissions and fees (expenses incurred by someone for a journey, for certain services, for putting into practice of an initiative, etc.). The loan terms, ie the interest rate, the repayment term, the possible grace period, the penalties for non-observance of the contractual clauses, etc., are negotiated between banks and debtors. The level of interest on bank loans is higher than that used by specialized financial bodies. The size of the bank loan cost, ie the interest rate, is determined by three factors: credit volume, interest rate, and lending time.

*Reimbursement of loans* is made in accordance with the annual and half-yearly, quarterly or monthly interest rate staggering, by constant or variable annuities or once, at the final maturity, with or without a grace period. Based on this, the company's financial compartment determines the financial flows generated by the credit decision that can be included in the income and expense budget. The cost of a medium to long-term bank credit to be reimbursed in annuities can be measured by the updated cost. This is why the discount rate allows for the equal amount of the contracted debt and the

annuities (repayment rate plus interest) to be updated with respective rates (King, 2016). Annuity can be broken down with or without taking into account the incidence of tax and the reimbursement method.

As stated, *bank loans* can also be reimbursed in other ways, with the cost of financing being determined by them. Regardless of the way of reimbursement, it can be concluded that these are generating costs that can significantly influence the company's treasury (especially if various management, insurance, reimbursement fees, etc.) are perceived, and impose the burden of equity on the guarantees required by the bank (sometimes, the guarantees required by banks can not be provided by soliciting firms, which requires orientation towards other financing methods, which may be more expensive).

*The obligatory loan* is a way of setting up financial resources at the company level for a period of more than one year and is realized through the issuance of bonds or securities that give the holder the right to a fixed annual interest regardless of the results of the company (Dobrota & Chirculescu 2009).

*The borrowed loan* typically has a lower cost than capital underwriting. Also, unlike share issue, the use of bank credit does not affect the profitability of shareholders, their ownership, nor does it change the influence of shareholders on the firm. In the case of a classic debenture loan without various commissions, issue or reimbursement premiums, the actuarial cost (total expenditure incurred for the purpose of producing or constructing a fixed asset intended to replace another totally used fixed asset with the same characteristics taking into account prices from the moment of replacement.) is equal to the nominal interest. However, in order to dimension the cost of the obligatory loan, it is also necessary to identify other categories of expenses, besides interest, including: issuance, advertising, bank fees, emission premiums, reimbursement premiums, etc. These are determined by initially in percentage, to be deducted from the total amount of the loan.

*Bonding involves both advantages and disadvantages* (Dobrota & Chirculescu 2009). Thus, the advantages of using this way include:

- determines the mobilization of important funding resources;
- allows banks and bank expenses to be avoided in obtaining the necessary resources;
- higher reinvested earnings are achieved than share-based financing;
- provides the possibility of early repayment in line with interest rate developments;

- does not change the ownership structure;
- does not entitle the company's claimants to take decisions.

At the same time, bond issues also have disadvantages, as follows:

- involves financial expenses, regardless of the company's results;
- causes the issuer's liquidity to diminish as a result of the repayment of the loan;
- there is a risk that the underwriting operation will not succeed.

*Leasing* is a financing method that can essentially assimilate to the loan, being used by companies that can not obtain loans from banks or do not want to impose their assets on movable or immovable property by installing pledges or mortgages. The user company of the acquired investment objectives is not the owner but the usufructuary tenant in this contract. So, from an accounting point of view, the borrower does not have the property of owner, the good necessarily in his balance sheet asset. However, leases are mandatory in off-balance sheet debt.

*Payments by the borrower* cover both the amortization of the loan and its cost, ie the normal remuneration of the leased asset (interest, commission and risk premium).

The cost of financing increases as the payout period expands and the advance paid by the soliciting firm is lower.

*Leasing financing* involves some advantages:

- the user company can channel its own resources for other purposes, avoiding their immobilization in long-term assets and accessing the new technologies in the field, as at the end of the period established by the lease, it can return the asset to the leasing company and can conclude a new lease for a good with superior technical-functional parameters;

- the good obtained is also a guarantee for the respective operation, the company's own capital remaining legally not engaged;

- the lessee can pay the customs duties at the end of the contract in the case of the imported goods at the residual value;

- tax incentives are recorded (in the case of the financial leasing contract, the goods that are the object of the lease are recorded as fixed assets in the user's account, deducing the expense of its depreciation, and the interest rate on the lease, in the case of the operating lease, shall be recorded as a fixed asset in the accounting of the leasing company and the lease rate shall be totally deductible for the user);

- the procedure for obtaining financing in a leasing system and the performance of such a contract are much easier than in the case of bank lending;
- the leasing company may provide certain services related to installation, commissioning, etc.

This means of financing also leads to disadvantages linked primarily to the high financing cost (which requires obtaining at least a return) and to the fact that it affects future self-financing due to the periodic payment obligations, and failure to pay a rate entails the loss the good and the obligation to pay all outstanding installments (in the current period, many companies are unable to pay their rates on the goods purchased under the leasing system).

Also, unlike bank credit, in the case of leasing, the transfer of ownership is done after the last installment has been settled. However, the latest legislative measures adopted in the tax area also affect this financing option for car purchases. Thus, VAT deduction for the purchase of new cars by legal entities and leasing companies is no longer granted, which will cause many economic agents to reorient themselves to other forms of financing.

The option for one or another mode of financing must also be based on the size of the marginal cost of the capital used. In other words, it is not sufficient to compare the specific cost of each funding source, but also to analyze the cost of each additional capital allocation, so that a comparison can be made between the effects of the funding process in different ways (Economides and Katsamakos, 2008).

The marginal cost has to be compared with the marginal rate of return and the cost of the capital must be determined in relation to the financial return required by the shareholders. Either an economic agent who has not regularly paid equity to shareholders may face difficulties in persuading shareholders or foreign investors to allocate or invest additional capital.

## **Conclusions**

Improving the business climate is a fundamental requirement for achieving effective market economies, but also for building a democratic system.

It is to be appreciated that, in the last period, the opportunities for financing all the economic and social activity were a basic concern of the economic policy.

Analyzing the financing mechanisms of the companies according to the reality of the national level, we observe that the companies in our country are

poorly capitalized, indicating a poor prospect of increasing their profitability and what makes the privatization process in the country quite difficult, is the lack of capital necessary for development and reorganization.

The economic agents in our country have mainly focused on financing by bank leverage and leasing and less on the issuance of shares or bonds. However, due to the emergence of a variety of financing instruments and risk mitigation on the market, there has been a tendency towards a varied financial structure that allows for an optimal ratio between the profitability determined by the resources used and the risk generated by their use.

*The financial structure and option for a particular structure* is an important decision of the funding policy, as the company's financial balance and management independence are conditional on them. The option for the equity / borrowed capital ratio should not be determined solely by the desire to obtain a high return but also by the risk that the manager agrees to assume.

In order to substantiate the financing decision, it is necessary to optimize the interests of the shareholders, the creditors, the state as well as the analysis of the influence exercised by the financial factors and the macroeconomic indicators.

Thus, we can conclude that the decision to opt for leasing or to buy a good by resorting to bank credit must be based on comparing the funding costs of the two alternatives and choosing that funding source at the lowest cost. Recording more difficult conditions in the use of share issues and accessing bank credits has increased the interest of bond investors as they generate secure incomes, unaffected by the economy's trend and the financial situation of the issuing company. It also requires an analysis of the leverage effect, respectively, of the impact of borrowing on financial profitability so that the ultimate result is maximizing the firm's value.

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## **RULES OF ETHICS AND DEONTOLOGY IN THE ROMANIAN CONTEMPORARY ACADEMIC ENVIRONMENT**

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**Abstract:** *Starting from the significance of the notion of “ethics”, which has been consecrated since antiquity, we will present in this article some aspects developed in the current legislation on rules of ethics and deontology in the Romanian contemporary academic environment. The law on national education contains detailed provisions on university ethics and enshrines the obligation to adopt the Code of University Ethics and Deontology. An example in this respect is the Code of University Ethics and Deontology of the “Athenaeum” University in Bucharest, which provides a set of acknowledged values and principles that underlie the rules of academic conduct. At the level of higher education institutions, Ethics and Deontology Committees are established, which draw up Annual Ethics Reports, but no centralized analysis of cases and causes of violation of university ethics has not been identified at national level to mitigate the negative impact on the quality of the educational act. In the application of the provisions of the National Anti-Corruption Strategy, 2016 - 2020, university and postgraduate training programs on ethics and integrity were set up, with an optional and mandatory character, but we cannot yet speak of a centralized comparative evaluation of the results of these programs. Current approaches to the development of academic ethics promoted by academic community members should be seen as good practices that require support and sustained efforts, including from civil society, to effectively contribute to the general public welfare.*

**Keywords:** *University ethics, deviations, sanctions, principles, Code of Ethics, Ethics Committees, Ethics Reports, National Anti-Corruption Strategy*

**JEL Classification:** *K4, K40*

## Introduction

The concept of “ethics” was first used by Aristotle, since ancient Greece, and has the following meaning: “**Ethics** (from Greek = tradition, custom) is one of the main branches of philosophy which deals with the research of moral issues, trying to deliver answers to questions like: what is good/evil? how should we behave?” (Wikipedia 2019).

The concept has been perpetuated and developed in the European area up to the present day, when we talk about “Applied Ethics” in several disciplines, such as: “ethics of information technology, ... ethics of scientific research, ethics in public policies, ethics of international relations, ethics of the media” (CCEA 2019).

**National Education Law no. 1/2011** (2011, Part I, no. 18), as subsequently amended and supplemented, establishes and develops the notion of “**University Ethics**” and provides for the acts that constitute “**serious deviations** from good conduct”, establishes the “**sanctions** that can be applied to the teaching and research staff”, as well as students and PhD students, for violation of university ethics and enshrines the obligation to adopt the “Code of University Ethics and Deontology” at the level of all higher education institutions.

For example, the **Code of University Ethics and Deontology of the “Athenaeum” University in Bucharest** (2016), provides for a set of acknowledged “values and principles” that underpin the rules of academic conduct. In the same sense, the **University Charter of “Athenaeum” University in Bucharest** (2016), contains provisions on the Code of University Ethics and Deontology.

In order to achieve the Specific Objective on “Increasing the integrity, reducing vulnerabilities and corruption risks in the national education system,” the **National Anti-Corruption Strategy 2016-2020** approved by the Government Decision no. 583/2016 (2016), provides for a number of key actions such as: “Establishing university and postgraduate training programs on ethics and integrity”.

In the context of increasing the public legitimate interest in the development and application of ethical and deontological rules in the Romanian contemporary academic environment, on all levels of activity carried out within the higher education institutions, the members of the academic community can represent the promoters of the change of attitude and can offer true ethical guiding marks for the entire national education system, in order to increase the quality of the educational act with a direct or indirect impact on civil society.

## **1. Regulating university ethics in the content of the National Education Law**

**The National Education Law no. 1/2011**, as subsequently amended and supplemented, contains imperative provisions according to which the University Senate elaborates and adopts: “University Charter”, “Code of University Ethics and Deontology” and “University Code of Student’s Rights and Obligations” (Law no. 1/2011, art. 213, para. (2), b), f) and g).

The institutionalization of university ethics in the National Education Law has generated public debates of real interest for the approved media, where it was appreciated that “Creating an ethical climate in universities and transforming them into ethically-shaped institutions has become a daily requirement. (...). Regardless of the reasons that have led to this ethical demand, it seems important to me that the National Education Law aims to rebuild the whole system on an ethical basis” (Frunză, 2011).

In order to ensure the quality of higher education, the National Education Law provides for the possibility of cancelling the results of an examination or of an assessment, as well as of a study certificate or diploma, if they were obtained in violation of the rules of university ethics and deontology.

Thus, according to Art. 144 para. (4) of the Law no. 1/2011: “The results of an examination or of an assessment may be cancelled by the faculty dean under the provisions of the University Charter when it is proved that they were obtained fraudulently or in violation of the provisions of the Code of University Ethics and Deontology.”

Also, according to Art. 146 of Law no. 1/2011: “The Rector may cancel, with the approval of the university senate, a study certificate or diploma when it is proved that it has been obtained by fraudulent means or in violation of the provisions of the Code of University Ethics and Deontology.”

In the same sense, the National Education Law regulates by imperative legal rules, both the **serious deviations** from good conduct in scientific research and academic activity, as well as the **sanctions** that can be applied to the teaching and research staff, as well as the students and PhD students, for violating university ethics.

Thus, according to Art. 310 of Law no. 1/2011, “the following constitute **serious deviations** from good conduct in scientific research and academic activity:

- a) plagiarizing the results or publications of other authors;
- b) making results or replacing the results with fictitious data;
- c) entering false information in grant or finance applications.”

**Sanctions** that may apply to teaching and research staff and auxiliary teaching and research staff by the university ethics committee for violation of university ethics or deviations from good conduct in scientific research provided by Law no. 1/2011, are the following (Art. 318):

“a) written warning;

b) reduction of basic salary, cumulatively, where appropriate, with management, mentoring and control allowance;

c) suspension, for a limited period of time, of the right to enrol in a competition for a higher teaching position or a management, mentoring and control position as a member of PhD, master or bachelor boards;

d) dismissal from the management position in education;

e) disciplinary dissolution of the employment contract.” (At the same time, Law no. 1/2011 provides, at Art. 324, **sanctions** that can be established by the *National Council of Ethics for Scientific Research, Technological Development and Innovation*, “for deviations from good conduct in research and development of the personnel of the higher education institutions, ascertained and proved” (extract): “... e) withdrawal of the academic title or degree of research or reduction to a lower rank; ...”)

**Sanctions** that can be applied by the university ethics committee to students and PhD students for violation of university ethics, provided by Law no. 1/2011, are the following (Art. 319):

„a) written warning;

b) expulsion;

c) other sanctions provided by the Code of University Ethics and Deontology.”

## **2. Code of University Ethics and Deontology of the “Athenaeum” University in Bucharest**

Based on the imperative provisions of Art. 130 para. (1) of the National Education Law: “Higher education institutions adopt a code of university ethics and deontology. It is part of the University Charter.”

We exemplify in this respect the **Code of University Ethics and Deontology of the “Athenaeum” University in Bucharest, 2016**, which provides: Chap. I - General provisions, Chap. II - Values, Principles and Responsibilities, Chap. III - Violations of Academic Conduct, Chap. IV - Rules on the application and resolution of incompatibilities provided by the National Education Law no. 1/2011, Chap. V - Disciplinary Sanctions, Chap. VI - Final Provisions.

In the same sense, the **University Charter of the “Athenaeum” University in Bucharest, 2016**, provides in Chap. VII - Rights and Obligations of the Teaching and Research Staff, at Chap. VIII - Student Rights and Obligations, and at **Chap. IX - The Code of University Ethics and Deontology**, which establishes at Art. 66 the following “values and principles”:

- „a. academic freedom;
- b. personal autonomy;
- c. justice and equity;
- d. merit;
- e. professionalism;
- f. honesty and intellectual integrity;
- g. transparency;
- h. respect and tolerance;
- i. responsibility;
- j. goodwill and concern for people;
- k. loyalty.”

In order to ensure the observance and application of these principles, which are the basis of the rules of university ethics, Law no. 1/2011 states at Art. 306 para. (1) and (3) that: “At the level of each university the university ethics committee operates with the following attributions:

- a) analyses and solves deviations from university ethics, based on complaints or self-complaint, according to the Code of University Ethics and Deontology;

b) draws up an annual report on the situation of respecting university ethics and the ethics of research activities, which is presented to the rector, the university senate and constitutes a public document; (...)”. According to Art. 218 para. (2) b) of Law no. 1/2011: *“The Council of Ethics and Management of the University decides on university ethics litigation and has as its main attributions: ... auditing the ethics committees in universities and presenting an annual report on university ethics. This report shall be made public”*.

At the “Athenaeum” University in Bucharest, according to the Activity Report for 2017-2018 (Ethics and Deontology Committee, 2017-2018), as well as the Activity Report for 2016-2017 (Ethics and Deontology Committee, 2016-2017), prepared by the *Ethics and Deontology Commission*: “During the academic year there were no reports of deviations from the university ethics and conduct in the scientific research, there were no reports either of the teachers and of the students, that are subject to the analysis of the Ethics Committee (...).”

### **3. University Code of Students’ Rights and Obligations of “Athenaeum” University of Bucharest**

Based on the imperative provisions of Art. 213 para. (2) g) of the National Education Law, the University Senate of the “Athenaeum” University of Bucharest adopted the **University Code of Students’ Rights and Obligations** (2019) which provides in Art. 4 the following “principles underlying student activity within the academic community:”

„a. **The principle of non-discrimination** - on the basis of which all students receive equality of treatment from the institution; any direct or indirect discrimination against the student is forbidden;

b. **The principle of participation in the decision** - on the basis of which the decisions within the higher education institutions are made with the participation of the students’ representatives;

c. **The principle of freedom of expression** - on the basis of which students have the right to express their academic opinions freely, in the educational institution in which they are studying;

d. **The principle of transparency and access to information** - on the basis of which students have the right to free and free of charge access to information regarding their own educational path and the life of the academic community they are part of, in accordance with the law.” (We express our view to

completing the “*Principle of Freedom of Expression*” with the following remarks: *except for political opinions and any form of discrimination of race, nationality, ethnic origin, language, religion, gender, political affiliation, wealth or social origin, and without prejudice to the dignity, honour, private life of the person, or to the right to one’s own image.* In this respect, see the provisions of the Romanian Constitution, republished in the Official Gazette of Romania, Part I, no. 767 of October 31, 2003: art. 4, para. (2) “*Romania is the common and indivisible homeland of all its citizens, irrespective of race ...*” art. 30, para. (6) “*Freedom of expression shall not prejudice dignity ...*”. Our trans.)

Considering that any right also has a correlated obligation, **the University Code of Students’ Rights and Obligations** governs in Art. 6 the students’ rights, and in Art. 7 students’ obligations, including the following (letters c and d): “To comply with the provisions of the University Charter and the internal regulations derived from it. To comply with the provisions of the **Code of Ethics and Deontology** of the University.”

#### **4. Applying the provisions of the National Anti-Corruption Strategy to the national higher education system**

The National Anti-Corruption Strategy for the period 2016 - 2020 envisages the Specific Objective 3.2. “Increasing the integrity, reducing the vulnerabilities and the risks of corruption in the national education system” and Main Actions for its achievement, such as:

“6. setting up university and postgraduate programs on ethics and integrity”;

“9. standardized publication of information on income, expenditure, public procurement, sponsorship, and academic activity at the level of state education/higher education institutions” (Ispas and Istratescu, 2016).

In implementing the provisions of the National Anti-Corruption Strategy, the Order of the Minister of National Education no. 3131/2018 (2018, Part I, no. 140) was issued on the inclusion in the curricula for all university education programs organized in higher education institutions in the national education system of the ethics and academic integrity courses according to which (Art. 1): “Starting with the academic year 2018-2019, courses of ethics and academic integrity are included in the curricula, for all higher education programs organized in the higher education institutions of the national education system.”

According to Art. 2 par. (3) and (4) of the same legislative instrument: “for the cycle of undergraduate studies, the courses ... will be optional” and “for the cycle of master and doctoral studies, the courses ... will be compulsory.”

Thus, the courses of ethics and academic integrity become **compulsory for master and doctoral studies**, the reason for the regulation being that, within these study cycles, individual creation and scientific research have a significant weight (Ministry of National Education 2018).

These measures are welcome, of course, but it may be appreciated that compulsory ethics courses were required earlier, since the pre-university education period, or at the latest during the undergraduate studies, taking into account the provisions of Law no. 1/2011 on “guaranteeing the originality of the bachelor’s thesis” (Law no. 1/2011, Art. 130 para. (1): *“Higher education institutions adopt a code of university ethics and deontology. It ... mandatorily includes: letter c) the educational, administrative and technical measures taken to ensure the originality of the Bachelor’s thesis, ..., as well as the related sanctions.”* Our trans).

We express our view to the existence of a compulsory subject in this field during university undergraduate studies, so that the stipulations mentioned in the law and in the university internal regulations (the Code of University Ethics and Deontology, the University Charter) do not remain unenforceable, while ethics and academic integrity courses are only optional.

So far, we cannot speak yet of a comparative monitoring/evaluation, centralized at national level, about the results of these courses.

Regarding the provisions of the National Anti-Corruption Strategy, on the “standardized publication of information on revenues, expenditures, public procurement, sponsorships ... of higher education institutions”, the standardization and publication of this information cannot be ascertained until now, on a large scale, for the university level, which requires consistent and coherent measures to be taken in the concrete application of these provisions.

## 5. University Online Code of Ethics

In November 2018, at the meetings first held at “Alexandru Ioan Cuza” University in Iasi and then at the University of Bucharest, Faculty of Journalism and Communication Sciences, the students formulated a series of proposals for the first University Online Code of Ethics, out of which we list the following (Badau, 2018a):

“1.1. Personal versus institutional: Students’ activity in the online environment does not engage the university’s image. However, students emphasize the importance of student image in relation to the University and society. / Online conduct should be decent, according to student status.” “1.2. Presenting the truth and verifying the information” “1.3. Public interest, not the interest of the public” “1.4. Civilized expression” “1.5. Avoiding exaggerated use of emotions” “1.6. Right to reply” “1.7. Respect for Intellectual Property” “1.8. Assumption of identity” “1.9. Networking” “1.10. Displaying advertising” (...) (Badau, 2018b):

This is a salutary approach in the context of activity digitization, at all levels of existence, as members of the academic community are the promoters of attitude change, ethical references and true models in the online environment, expectations concerning them being appropriate.

## Conclusions

In applying the provisions of the National Education Law, at the level of the higher education institutions, the University Senate adopted: “The University Charter”, “The Code of University Ethics and Deontology” and “The University Code of Students’ Rights and Obligations.” An example of this is the Code of University Ethics and Deontology of the “Athenaeum” University in Bucharest, which provides: Values, principles and responsibilities, Violations of academic conduct, ..., and Disciplinary sanctions.

According to the Activity Reports for the years 2017-2018 and 2016-2017, prepared by the Ethics and Deontology Commission, established at the “Athenaeum” University of Bucharest: “... there have been no reports of deviations from university ethics and conduct in scientific research ....”

Violation of ethical rules may have a negative impact on the quality of the educational act as well as on the socio-professional quality of the results obtained, which can be propagated and reflected on the direct and indirect beneficiaries of the services offered and, last but not least, on the image and credibility of the higher education, by perpetuating so-called undesirable “models” in the academic, professional and social environment. *“The social effects of the lack of authentic values can concretely materialize through a series of consequences: decreasing the quality of education; setting up negative perceptions at the level of society about what university education represents;*

*the devaluation of the status of university teaching staff; stigmatization of scientific research; underestimation of doctoral studies”* Sercan, 2017, p. 57).

We consider it necessary to establish a system of quantitative and qualitative indicators on the level of knowledge and observance of the ethics and integrity rules at the level of the higher education institutions, on the basis of which an objective evaluation and centralized reporting are made, leading to taking examples of good practice in terms of prevention as regards ethics and integrity and removing the causes of possible breaches of these rules.

In this sense, it would be necessary and useful to centralize and evaluate the Annual Ethics Reports prepared by the Ethics and Deontology Committees at national level.

In the application of the provisions of the National Anti-Corruption Strategy, 2016-2020, on the “establishment of university and postgraduate training programs on ethics and integrity”, starting with the academic year 2018-2019, ethics and academic integrity courses, for optional bachelor’s study cycle, and for compulsory master and doctoral study cycles were included in the curricula.

In order to ensure the “guarantee of the originality of the bachelor’s theses”, we express our view to the existence of a compulsory subject in this field since the Bachelor’s studies.

In applying the provisions of the National Anti-Corruption Strategy, on the “standardized publication of information on revenues, expenditures, public procurement, sponsorships ... higher education institutions”, we consider that unitary and coherent measures are needed, such as the creation of an integrated IT platform, according to a standardized model that can be accessed by all higher education institutions, which would of course involve concerted efforts and resources, the ultimate goal being to increase the quality of the academic educational act and to translate it into the public common welfare.

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## **METHODS USED TO ANALYSE ECONOMIC VARIATIONS OF CHRONOLOGICAL SERIES**

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**Abstract:** *Statistical data in chronological or dynamic series is different from the other data series ordered according to the time variable. This is the importance of studying the chronological series. One can determine the important role of the time factor in social economic phenomena as in other areas. In fact, in the economic and social life much of the data subject to research is constituted as chronological series. An important component of the chronological series along with trend, random and cyclical oscillations are seasonal oscillations. The article presents the methods by which seasonal oscillations can be analyzed.*

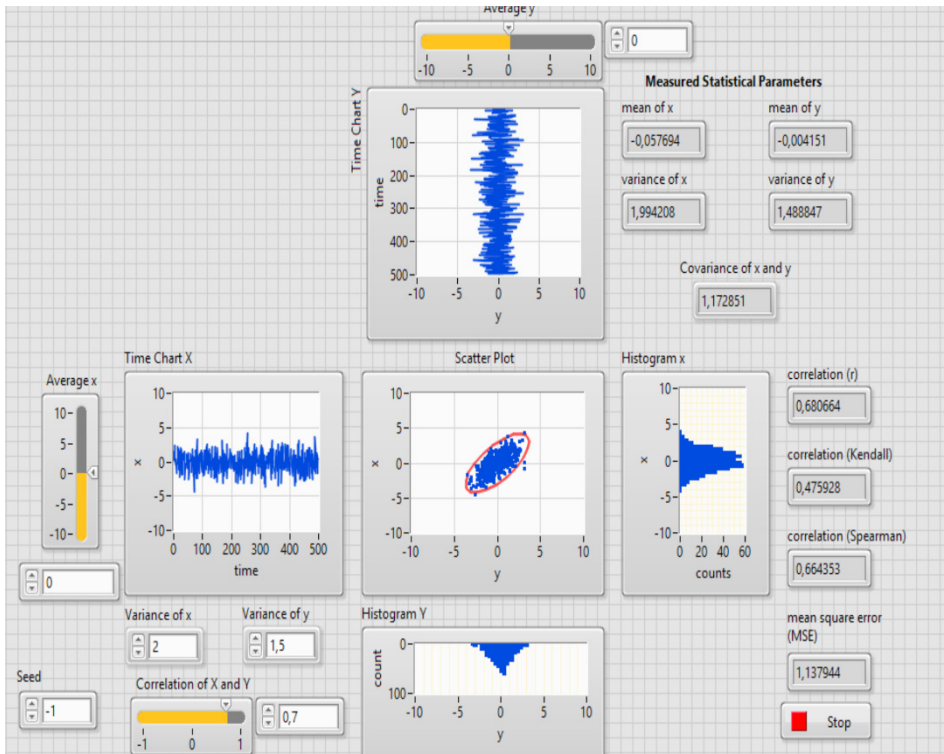
**Keywords:** *oscillations, series, model, index (coefficient), mass phenomena, perturbations, periodicity*

**JEL Classification:** *C23, C38, M37, M40*

Economic oscillations have the character of periodic series in the sense that they are repeated with greater or less regularity in each period, respectively in each year. The truly periodic series exists only theoretically, but seasonal variations are quite close to this model. The assumption that underlies the model of periodic series is that they are caused by systematic causes rather than by accidental causes. Numerous examples of economic variations can be quoted: sales of cars as well as refreshments, atmospheric precipitation, or temperatures recorded over a year, etc. The systematic causes of such variations are repeated periodically, although some deviations may occur. The analysis of seasonal variations is, in our view, of some practical interest. The

analysis allows, for example, to determine when stocks should be set up to change seasons. It allows to explain the variations in some areas of production, the movement of goods, etc. It should be noted that variations like seasonal or periodical variations can be found in some areas of economic life, for example in the field of energy production and consumption, and during a week or during a day. In Figure 1 is a simulation of statistical analysis of a time series.

Figure 1. Statistics solver from economic time series variations

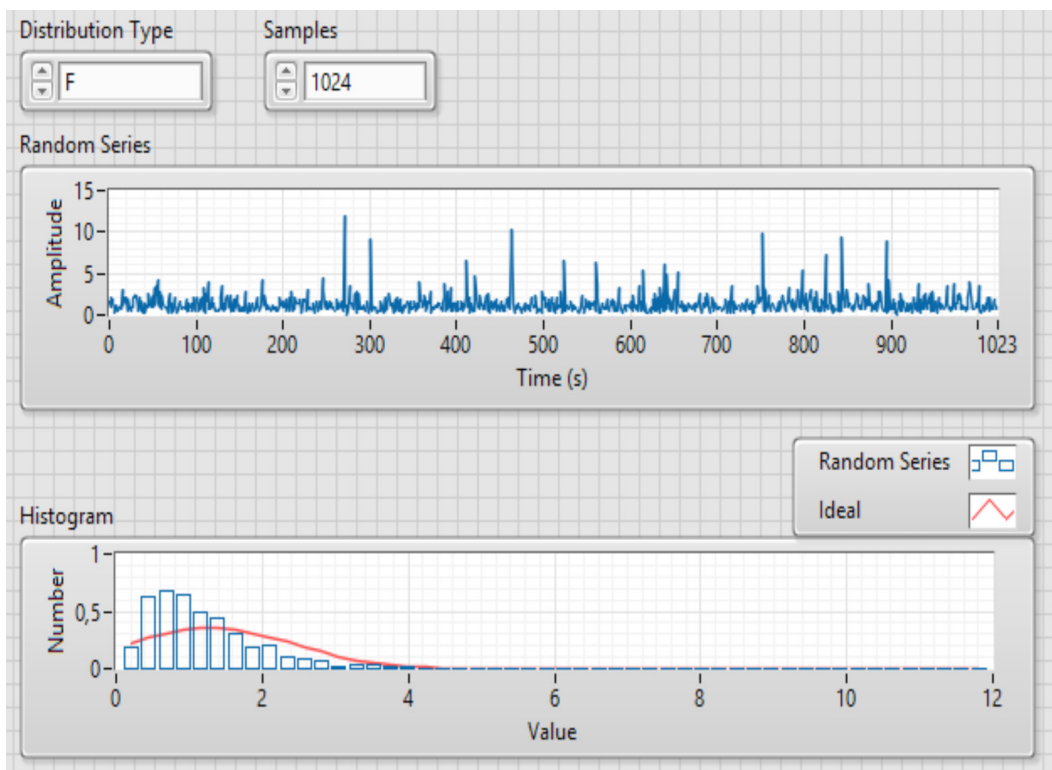


First, it is useful to recognize the magnitude of the variations, finding ways to measure them, and calculating a seasonality index valid for a whole series of annual periods. Second, it may be useful to know the evolution of mass phenomena with the elimination of seasonal variations. The idea behind the calculation of seasonal variations is the possibility and usefulness of determining that part of the annual total that is due to each of the twelve months of the year. The incidental factor that may occur in a given year is considered to be independent of the one that may occur the following year. If there is a

very rainy July in a year, this incident factor is considered to be independent of any factor that may happen in July of the following year or any other July. If they are summed up for July in a series of years, the perturbations caused by random factors will offset each other. If the trend is eliminated, what will remain will be the seasonal variation that can be expressed by an index or coefficient of seasonality.

There are several methods to calculate the seasonality index (coefficient). First, the Simple Media Method presents itself as it allows to explain the underlying idea of the other methods in a form elementary. It should be stressed that in practice the Simple Media Method uses less. If there is a monthly data series (for two years, the number of monthly data may be prolonged, the essence of the calculation procedures remaining the same).

**Figure 2.** Magnitude of the variations, finding ways to measure them, and calculating a seasonality index for a random series of annual periods



In order to have the effect of seasonality, the trend will have to be eliminated. The Least Squares Method is used for this purpose. An example is given in Table 1.

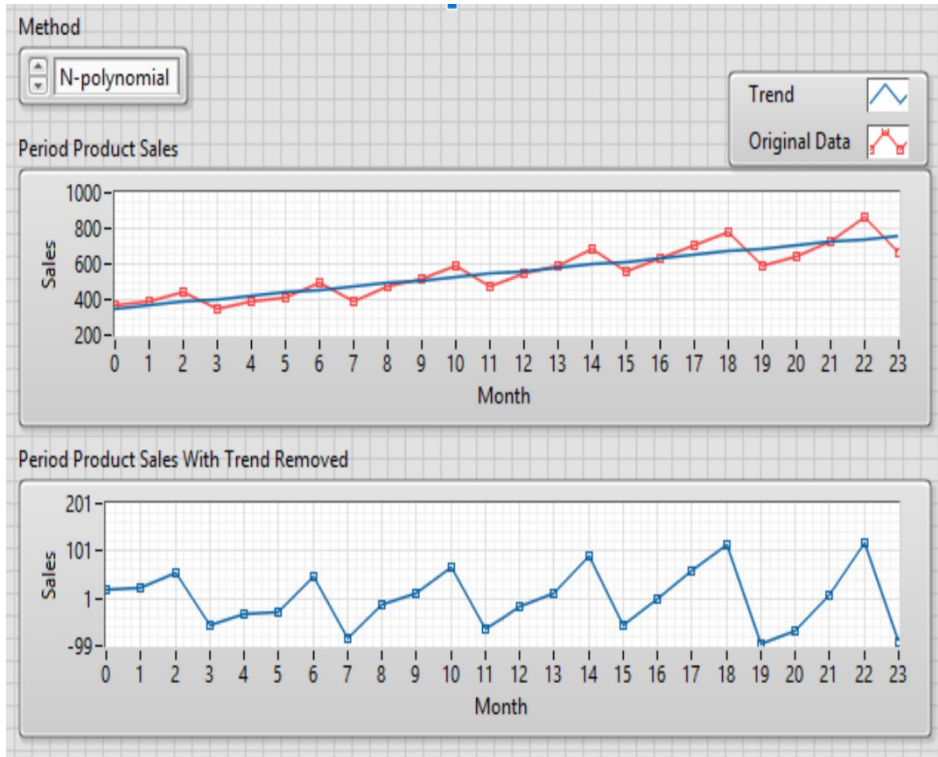
Table 1: Monthly data series - many years

<b>year</b>	<b>x</b>	<b>y</b>	<b>xy</b>	<b>X<sup>2</sup></b>
1	-1	520	-1040	4
2	-2	560	-580	1
3	0	530	0	0
4	1	630	630	1
5	2	790	1520	4
<b>Total</b>	<b>0</b>	<b>3070</b>	<b>610</b>	<b>10</b>

**N-polynomial Method** - the most commonly used method for measuring economic variations. Since the variations have, by definition, a 12-month period, the 12-month moving averages are used. The mobile media method basically consists in calculating the seasonal components of the chronological series by dividing the trend into the total successive values of the series, with the coincidental incident factor being also eliminated.

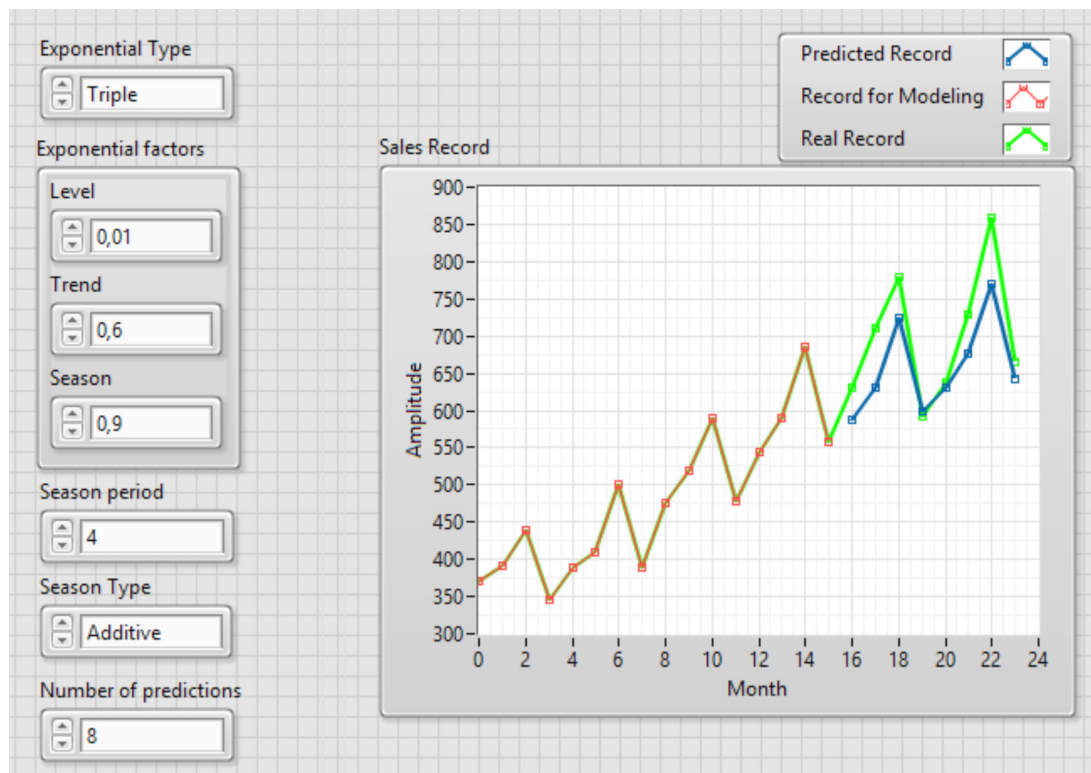
Some complication in applying the method occurs because there is a 12-month period in the calculation of mobile environments (if the data they are working on are quarterly with a four-quarter period), there are apparent numbers. It will be a question of centralizing the first results obtained by calculating mobile environments (temporary mobile environments) to reach centred mobile environments.

Figure 3. Periodic product sales with trend removed using N-polynomial method



The use of statistical and econometric models in macroeconomic analyzes can be performed successfully using the exponential linear regression model, but because multiple variables are used in the evolution of the variable variables. In the case of this multiple exponential linear regression, it is necessary to identify the factors that we are considering and to be included in the reconnected model, following the same grappling procedure, establishing the correlogram to inventory the points cloud and the evolution of each variable , on the basis of which we will perform the data interpretation and moreover by establishing the value of the regression parameters to identify the intensity, the direction of influence or, in other words, the intensity of the correlation between the considered factors.

Figure 4. Predict results using exponential regression model



## Conclusions

Studying socio-economic phenomena and processes in terms of their evolution over time is a necessity for economic agents, an important condition for substantiating economic decisions. In our opinion, a particular emphasis must be placed on the statistical analysis of the evolution of phenomena over time by processing the chronological series that show in the end the evolution of a phenomenon within a determined period of time.

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