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DETERMINATION OF COMPANY VALUE BY THE APPROACH BASED ON ASSETS

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Abstract:
This paper treats method based on assets of valuation of firm. So, after short theoretical considerations about this method we presented a practical study of valuation for a leasing firm. The method based on assets, also known as patrimonial method, the method based on costs and the method based on replacement costs, consists in correcting (adjusting) the book values of individual assets and company debts to convert them in market values.In this assessment, the company is mistaken with its assets, namely with the net asset, the valuator considering it as disjoined, respectively as an amount of assets.

Key words: company value; method based on assets; patrimonial value.

1. Introduction

The company has value because it owns assets of a certain value (real estates, lands, liquidities, etc.) and can be negotiated separately, outside any other considerations. The evaluation is done checking the possible sale price of different assets composing the company (**liquidation view**), or the possible purchase price for the same assets (**reconstruction view**). Therefore, we can speak about **patrimonial methods which support the seller's point of view** and, although, they refer to the company in its liquidation stage, creasing the activity and **matrimonial method which support the buyer's point of view** referring to the situation of continuing the activity. But, there must be made an ascertainment that: in any case, the patrimonial methods ignore the company's capacity to create value, as it values only as much as the assets which compose it.

2. Content

Seen from the seller's view, there can be established the following **patrimonial assets** for the company:

- the total assets net value (the mathematic book value);
- discounted net asset or reevaluated;
- net asset corrected or amended (intrinsic mathematic value);
- liquidation asset.

The total assets net value (AN_c) is the simplest and fastest estimation method, being recommended, with precedence, for the evaluation of small companies. In case of relatively economic stability, AN_c literally represents a patrimonial value of the company, as it comprises the invested capitals and the unassigned benefits. It is recommended to use this method only in conditions of stability, as it uses historical costs which loose their significance in case of an inflationary economy. Despite all this, even if in our country we can not speak about stability, this method had been used in the management/employee buy-out process (MEBO method) and in the process of mass privatization. The main reason to select such type of method represents the possibility to calculate the net asset, without calling into requisition to the services of expert companies which not only require high costs, but also for a certain period of time.

Other names for the same method are the **evidenced net asset** or **net asset value**.

The evaluation based on the total assets net value is preferred by the owners whose company had been incorporated a long time ago, accumulated an important property, but which profitableness has the tendency to come to a standstill or event to regress. The determination of the total assets net value is done based on the data from the last balance sheet where the result of the financial year had

been assigned on destinations. Therefore, in the capital accounts we will not find the dividends to be assigned or the employees' participation to the results of the exercise. Therefore, ***total assets net value corresponds to the value of capital accounts*** and is obtained as a difference between the total assets net value and the total book value of debts:

AN_c = Total assets value – total debts

or breaking down the aggregate asset into its components (long term assets and circulating assets):

AN_c = Long term assets + Circulating assets – Total debts

Therefore, taking into considerations the accounting and fiscal usages, which alienate from the economic reality and, especially, the factors producing disturbances between the company balance sheet and economic balance, (the currency exchange ratio, price evolution, monetary erosion, redemption system, etc.) there occurs the stringent *necessity to correct the total assets net value.* So, taking into consideration the accounting and fiscal usages, which back away from the economic reality, and, especially, the factors causing disruptions between the company balance sheet and economic balance (the currency exchange ratio, price evolution, monetary erosion, redemption system, etc.) *the need to correct the total assets net value* appears as stringent. So, is done, first of all, when eliminating the non-values, when eliminating the provisions, when reevaluating the income units, the book debts and bond currencies etc., and also for correcting the asset elements depending the criteria of use. Therefore, first of all are eliminated the non-values, the provisions, are reevaluated the income units, the book debts and bond currencies etc., and also for the correction of assets elements depending on the utility criterion.

If the corrections made refer only to *price update and exchange ration* it is obtained the **reevaluated net asset** (AN_r).

But, if we take into account the *entire group of factors* which caused disturbances between the balance sheet and economic balance (which is founded based on the market exigencies) we obtain the **corrected** or **reformed net asset** (ANC).

The reevaluated net asset (AN_r) is the net property for the reevaluated values (updated) and represents the net property for the reevaluated values (updated).

During the period when the inflation is measured with two or even three numbers its incidences are eliminated with the help of indexes calculated based on the price evolution or on the exchange ratio. These indexes shall apply to the initial values of the asset elements. They can be outlined separately for each element or generally as an average index. Usually, in practice, is often used the evaluation based on the *average index.*

If pursuant to the diagnostic analysis it is noted that occurred modifications also in regard of debts, they shall be corrected in addition or in reduction.

Corrected net asset (ANC) is the most used property value and it basically represents the capital amount necessary to reconstruct the company existent net property, at the level of its availability real value. The inconvenience of the method of total asset net value, where the evaluation of its elements is performed at the historic cost impose the need to re-treat the balance sheet and to perform an economic balance to reflect, as precisely as possible, a company net property. Same as the method for reevaluated net asset, also now the main modifications shall take into account the patrimonial assets and very few of company debts.

The main *features* of the model are:

- operates with economic vales of property assets, but not with book values;
- at the base of determination of the company value is the economic balance, not the balance sheet;
- the company value is given by the value of the corrected net property.

The corrected net asset is based on the ***value of use (usage)*** of property elements needed for use. *The value of use* represents the price due to be paid in order to purchase, at the appropriate moment, an element capable of the same conditions of use, in the same working conditions, having the same period foreseen for residual use, same performances and same destination of use.

Elements outside the exploitation (needed for exploitation) are evaluated separately depending on the capitalization possibility. The later may be: lands, buildings, machines, deeds of property which

can not be sold, stocks difficult to be sold etc. their evaluation is done at the *net venal value* which is the amount to be cashed at their sale. This operation to separate the assets necessary for the exploitation from the ones outside the exploitation has as effect the rise of beneficiary capacity in comparison with previous profits when by diagnosis it is noted the degree of use of assets patrimonial elements, weather by changing the destination of personal and real assets without any use or with reduce usage for performing the object of the exploitation of the respective company.

For the cases of companies found in difficulty for which is estimated the reduction or even the ceasing of their activity, the reevaluated net asset or the corrected net asset is replaced with a **net liquidation asset** (ANL) which takes into account if the liquidation is done progressively or immediately.

View by the buyer's point of view, there can be established the following values for the company:

- substantial value (operational);
- permanent capitals necessary for the exploitation.

The substantial value is a notion with reference to the exploitation of the asset taking into consideration only the specific assets which contribute to the basic activity. Therefore, **the substantial value** is the total value of the existing assets available for the company, no matter of their financing method, which they effectively use in order to ensure the performance of the object of activity, which provide the continuity of the activity. This supposes that at the total of the asset is added the value of assets used by the company, but which are not mentioned in its accounting, therefore it is not freeholder. The non-corporate elements shall be separate and evaluated according to specific criteria. Also, at the base of company value established using this method stands the economic balance, the value being given, as we mentioned before, by the net property afferent to the main activity.

The permanent capitals necessary for the exploitation (CPNE) contain the assets necessary for the exploitation plus the need of working capital for the exploitation. The assets are estimated at their net value, and the need for the working capital starting form the level of activity predicted. Therefore, we have the following calculation formulae:

CPNE = Net assets for exploitation + NFRE

CPNE does not show the real value of the company, but only the value of the capital necessary to set up a company with the same characteristics as the evaluated company. CPNE is quite appropriate as value to the total economic asset of the company, as it reflects the entire resources necessary to set up the exploitation assets and the need of working capital for exploitation.

For showing in practice the content of the evaluation method based on assets we determined the total assets value and the corrected net asset for the company S.C. RO LEASING S.A. Craiova in order to establish the value of shares to raise the authorized capital. At the evaluation date, the subscribed authorized capital was in amount of 12.808 millions lei divided into80.050 shares with a nominal value of 160.000 lei.

Table 1. The evolution of the main financing economic-financial indexes

Crt. no	Indexes	1996	1997	1998	1999	2000	2001	2002	2003
1.	Authorized capital	3.970,0	6.500,0	7.875,0	8.005,0	8.005,0	8.005,0	8.005,0	12.808,0
2.	Capital accounts	4.099,8	7.538,6	9.997,7	11.777,2	13.091,0	16.150,3	17.137,3	18.716,2
3.	Average no of employees	1,7	9,5	11,5	13,2	13	13	13	13
4.	Total incomes	314,1	5.962,5	10.487,8	15.640,8	21.625,4	29.047,5	29.687,2	29.442,8
5.	Total expenses	104,3	1.723,9	4.211,7	6.647,5	13.367,6	18.670,9	23.532,3	24.247,9
6.	Gross profit	209,8	4.238,6	6.276,1	8.993,3	8.257,8	10.376,6	6.154,9	5.194,8
7.	Net profit	129,8	2.936,7	3.925,0	5.257,4	5.840,2	7.642,7	4.559,9	3.861.1
8.	Assigned dividends	-	1.864,8	3.506,2	3.748,0	4.300,0	4.400,0	3.418,0	2.160,0
9.	Profitability (Gross profit/ total	201,2	245,9	149,0	135,3	61,8	55,6	26,2	21,4

Crt. no	Indexes	1996	1997	1998	1999	2000	2001	2002	2003
	expenses)%								
10.	Profitability of authorized capital (Net profit/ authorized capital) %	3,3	45,2	49,8	65,7	73,0	95,5	57,0	30,1
11.	Financial profitability (Net profit/ capital accounts) %	103,2	39,0	39,3	44,6	44,6	47,3	26,6	20,6
12.	Works productivity (incomes/ employee) mil. lei/ employee	184,8	625,6	912,0	1.184,9	1.663,6	2.234,4	2.283,6	2.264,8

The society registered during its period of existence a financial profit (due to shareholders) over the average profitability from the banking system and higher than the interest rate without risk, respectively the interest rate to CEC, the bank which guarantees entirely the population deposits.

In cases when society is not quoted on the stock market, the establishment of its value presents interest, first of all, for its shareholders, but also for its image in its relations with third parties (suppliers, clients, potential creditors).

a. The determination of the **book value per share** at 31.12.2003 takes into consideration the non-evaluated balance elements as follows:

1. Fully paid shares	12.808.000	thousands lei
2. Reserves	5.889.087	thousands lei
3. Capital accounts (total assets value)	18.697.087	thousands lei
4. Number of shares	80.050	
5. Book asset per share (3:4)	**233.568**	**lei**

b. The determination of the unitary value using the **method of corrected net asset**

1. Total assets value at 31.12.2003*	18.697.087	thousands lei
2. Doubtful clients and equipments which can not be recovered at 31.12.2003	1.259.111	thousands lei
3. Gross payments to be made, afferent to contracts in progress at 31.12.2003, during the period 2004-2007	25.069.828	thousands lei
4. Total expenses afferent to incomes (25.069.828 x 810,6 ‰ registered in 2003)	20.321.602	thousands lei
5. Gross profit (3-4-2)	3.489.115	thousands lei
6. Net profit (rd.5-rd.5x25%-rd.2x25%)	2.302.058	thousands lei
7. Total corrected net asset (1+6)	20.999.145	thousands lei
8. Number of shares	80.050	
9. Corrected net asset per share – lei	**262.325**	**lei**

It is noted that by the approached based on assets, the values obtained are enclosed in an acceptable tolerance, respectively 12%, which justifies the proposal for a sale value of shares between these intervals.

3. Conclusions

Now, in our country, we consider that the approach based on assets will play a very important role because, although all companies have as main objective the rising of value, they do not have yet the role they should have on the exchange economy.

The patrimonial values do not cover the entire value of a company and, usually, they are avoided as exclusive values for transaction due to certain *limits*:

- *incorrect character,* because the non corporatist elements are not taken into consideration;
- *strictly static character,* as they do not take into consideration the company strategy;
- *complex character,* due to the fact that, sometimes, it is difficult to have an accurate idea over the value of some assets from the company property, especially the industrial specific ones and, implicitly the risks of occurrence of errors are significant.

The company is not only an amount of assets, book debts and debts, but it must be seen more of an "*alive organism*", which beside the things mentioned before it disposes of a goodwill, intangible elements, market elements which make up the company goodwill, namely an additional value for the company, a fact which justifies the use of the method based on assets together with the methods based on income and comparison. Beside, the legislation mentioned precisely the use of several evaluation methods for the company in order to be sure that the company value is the most appropriate to the real one.

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CONSIDERATIONS CONCERNING THE ROLE OF ACCOUNTING AS INFORMATIONAL SYSTEM AND ASSISTANCE OF DECISION

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Abstract:
The accreditation of accounting as scientific discipline is far from being achieved. In our attempt to establish the status of accounting as a science, we have used the current understanding of the term, and the contemporary perspectives on know-ledge in general.

Key works: information system and assistance of decision; accounting; accounting as measurement system; accounting as information system; accounting as instrument for social intermediation

1. Introduction

From a signally practical activity, of which knowledge was empirically acquired, by error successive elimination, the accounting became a scientific discipline, as the increase of its decisional role imposed the systematization of knowledge used in practice. Besides, this is the reason for which was needed that the accounting practice to be based on an accounting theory and on a conceptual basis, at the fundament of which the research starts to play a determinant role.

The accounting authorization as a scientific discipline is far from being finalized, as the options concerning this matter are various, starting from the total rejection of accounting as a science, passing then through the stage as a science in its "teenage" phase, while other authors to consider it as a "mature scientific discipline".

The tentative to establish the accounting status stops, firstly, into different approaches concerning this matter. The definitions given to the accounting differ a lot, both in time and space, so now we do not have a unity in reference to this matter, therefore, for the characterization of this discipline are proposed in a multitude of variants, out of which we remind the most important ones: art, techniques, informational system, language, social game, science.

2. The characterization of accounting by means of its role in supporting the processes to adopt decisions inside an organization

Without proposing analyze of the character kind of contradictory of these terms, we will try to characterize the accounting by means of its role in supporting the process to adopt decisions inside an economical entity. Taking into consideration the sides of accounting outlined in the special literature, and also the evolution in time for the solutions proposed to define it, one might make a grouping of explanatory models in three important categories: **accounting as measurement instrument; accounting as information instrument; accounting as social intermediation instrument**.

As measurement instrument (Figure 1) accounting is approached as an activity having as scope to reflect the company economic activity. Seen in this context the accounting is assimilated especially to an art of recordings or to an administrative technique, points of view which, in our opinion, have a limited character, as they reduce its role only to entries. Approaching accounting as an informational instrument coincided with its definition as a informational system represented by "*an assembly of elements (human and material resources) which allow the collection, processing, stocking and communication of information, in order to take the decisions*".[1]

[1] Ionaşcu, I., (1997), *Epistemology of Accounting*, Economic Publishing House, Bucharest, pp.37.

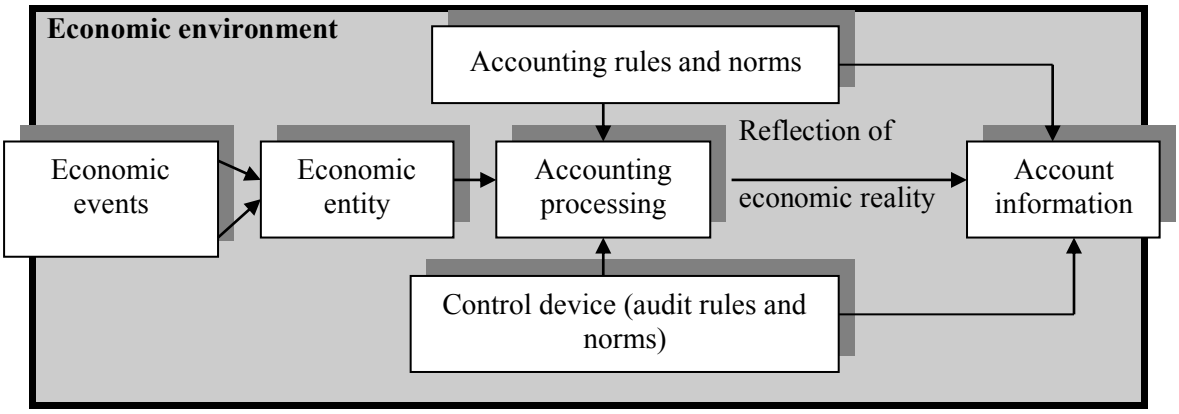

Figure 1 - Accounting as measurement instrument

As we can see, including the next figure, accounting is not seen anymore exclusively as a monetary quantization instrument of economic reality, but as a system having as scope the supply of information in order to take the decisions, representing reality is not a scope by itself anymore, being subordinated to a new concept aiming to satisfy the informational needs. Accounting continues to fulfill its measurement function, but it is subordinated to a scope, a fact outlining a new dimension, by taking into consideration the users of information produced by it, and also their needs, which, in our opinion, have the same importance in the inflation conditions.

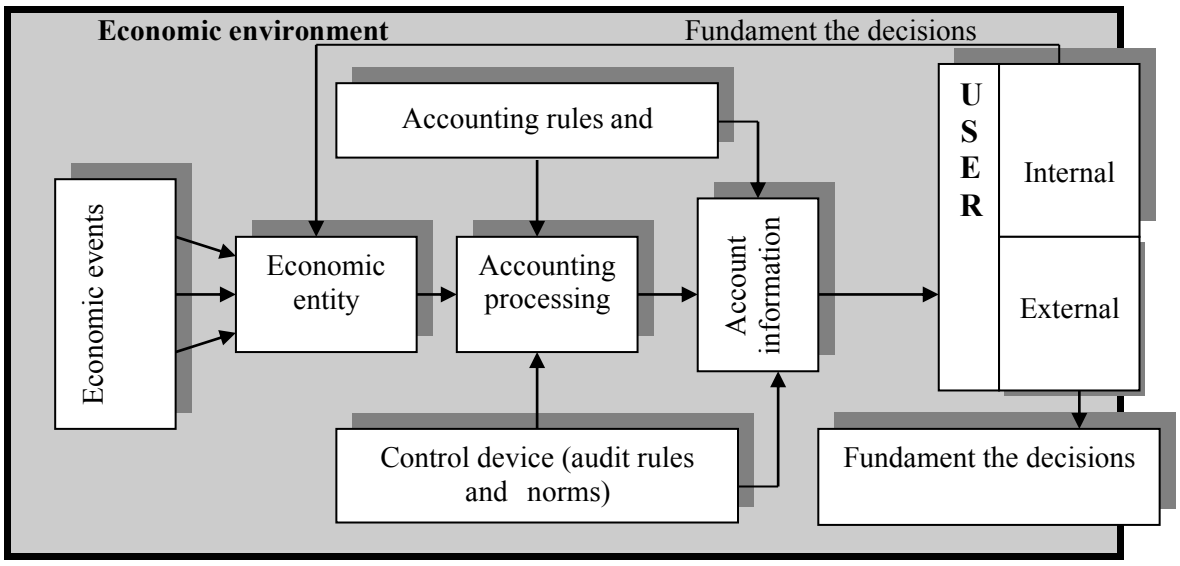

Figure 2. Accounting as information system

Informational activities specific to accounting area are the one concerning the production and use of account information and make reference to actions aiming creation, collection, stocking, processing of data and then the distribution of information. These activities suppose the performance of some registration operations and calculation, and also actions of analyzing, interpretation, grouping, synthesis and use of information in order to take any decision. Extending the perspective over the accounting, by taking into consideration the user of information offered by it, had been outlined its communication function, as the transmittal of information to different categories of users for taking any decisions is just only a communication activity. In case of accounting we are speaking of an accounting or financial communication, where the connection is established between the company, as transmitter (producer) of information, and all individuals interested to use these information, as beneficiaries or receivers of information. The main way of transmitting the accounting products is represented by the annual financial situations, the information transmitted being obtained pursuant to

the representation of the company economic reality using a special language, specific rules and principles. Therefore, the account information is built using a specific language, certain rules that allow the coding and decoding the represented data, all these providing the methodical and comprehensible representation of the economic reality. The utility of account information in financial communication is tested in cases when receivers use it in order to understand the economic reality and take decisions. So there arose the idea to define accounting as a "formalized language", being generically denominated as a "business language", characterized by three dimensions:[2]

- the accounting syntax represented by the group of rules and procedures which must be followed in order to register the transactions and elaborate the synthesis accounting documents, starting from the symbols forming the accounting vocabulary – in this case the stress is laid on the representation function of the economic reality;
- the semantics of accounting language which process the signification of the signs submitted by accounting – emphasizing the informational function;
- its pragmatic aspect refers to the communication of account information and the method of use by different users – again the emphasis is laid on the informational function.

Describing the accounting under this form is characteristic to the present account view, this change of perspective affecting both the external accounting reference – the normalization by conceptual account frame defines the scope of financial situations as the submittal of information for founding the decisions, and also the internal one – from a cost accounting becoming a managerial one, the emphasis being laid again o its role to transmit information to the manager for taking decisions.

The accounting approached as an informational instrument, although its exceeds as explanatory value the technical view over the accounting, but it has certain deficiencies, as it fails to offer a full image, without taking into account a series of important factors. In this case arose the need to enlarge the perspective over the accounting in order to point out also other side of it, occurring the idea according to which accounting is a social intermediation instrument.

According to this view, as seen from figure 3, the measurement and informational functions are send in a secondary plan, and in forefront are evidenced the consequences the account information has over the social environment. Practically, it is realized the fact that choosing and applying certain accounting politics have extremely important consequences over the reassignment of wealth and risks between different participants to social life. In our opinion, the social role of accounting has to be considered as a priority, as it offers the possibility to establish criteria depending on which is made the reflection of reality and the information for different categories of users, in order to obtain the wanted economic-social effects.

From the Figure 3 we can note that the offer for account information, their quality and also the distribution process have to be approached in the context of accounting dimension and social function, of social stake exercised by its products. Obtaining the account information takes place pursuant to processing and interpretation of data, using some concepts and specific principle, applying several methods and politics in order to reflect the economic reality of an entity and to offer the information necessary to those who take decisions or who are interested in the respective entity.

Without any doubt, the accounting represents the main source of information for managing an economic entity in order to administrate, forecast and control its activity. The company managers have a privileged status on the market of account information, given by the double role they play as its legal representatives: producers of account information, being responsible for the issuance and submission of financial situation; users of account information. The information to which the internal users have access to exceed the area of the published ones, the managers being able to request and dispose of all information which the accounting system is capable to produce, both by financial accounting, and by the management accounting, their unlimited and immediate access to these products creating a informational asymmetry in respect to external users. In the same time, we consider that we must mention also the fact that the managers use the account information both for founding the decisions and also as an important communication method with external users, the submittal and publication of financial situation representing the main transmission method of the accounting products.

[2] Esnault, B.; Hoarau, C., (1994), *Compatbilite financiere*, Presses Universitaires de France.

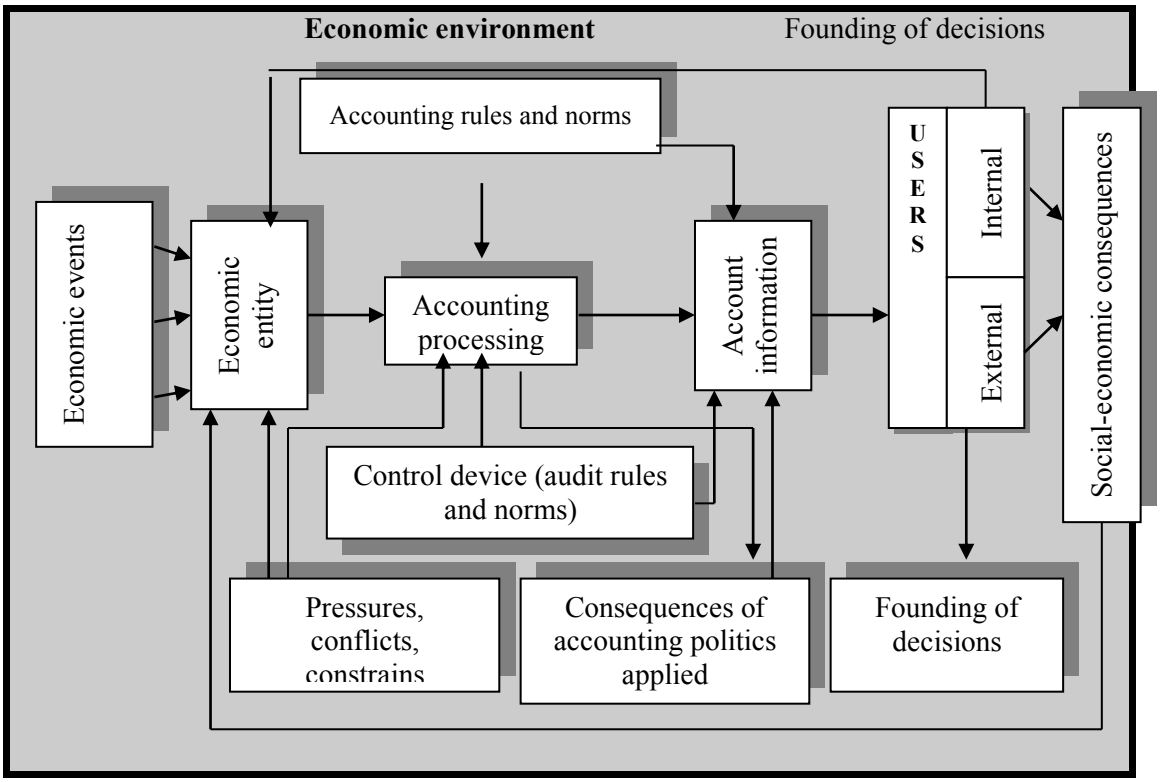

Figure 3. Accounting as social intermediation instrument

Along its evolution the accounting had to find solutions and to adapt to the economic reality, fact which leaded to the use of some notions and accounting terms, and also to the occurrence and appliance of some rules and conventions in order to obtain the information. So, the accounting has became today a complex technique of registration and reflection of economic-financial reality, an informational system adjusted to the users needs, an administration and communication instrument which provides the company integration and dialogue with its external environment.[3]

Accounting has as scope to measure and transpose in a proper language one entity activities, but this process is directly affected by its specific rules and norms, which are, in their turn, the results of elements (factors) like culture, economic development, history, institutions capable to establish these types of rules etc. The company relationships with the environment where they perform their activity generate the need of relevant and objective information, of which satisfaction needs an adequate offer.

The production of account information is provided by the specialists practitioners in the area, a process performed organized, inside the accounting informational system of economic entities. This type of information must have to satisfy certain needs, so to have utility for all the ones making up the category of users of accounting products, a fact for which their submission must be built in a dynamic and rational process, result of the negotiations and compromises between the company and the external factors. Beside, the market of account information represents the way to confront and regulate the offer and the request in this area. In this context the offer denotes the total information obtained inside the accounting system, and also the forms and methods to distribute them, while, on the other side of the barricade, the request is being represented by the users' informational needs of this type of products, and also by the pressure they lay over the generating system.

As we previously noted, the informational offer is the assembly of information available for different groups of users, to this component of the communication process and capitalization of the products of accounting system being attached the concept of producer (tenderer) of account information. The inclusion area for this type of offer is relatively ample, the financial communication to different users being performed on different ways. Even if the methods to communicate the

[3] Minu, M., (2002), *Accounting as power instrument*, Economic Publishing House, Bucharest, pp. 145.

information are various, we express our view that the method, used by the producers transmitting their informational offer to its beneficiaries, still remains the elaboration and presentation of financial situations. The objectives of financial situations developed in time and we can say that they had been conditioned by the objectives specific to the accounting system from each country and by the users which requested and had access to account information. Now, the objective of the references performed periodically by means of the synthesis documents is very complex, because beyond satisfying the investors need and the help given to managers in administrating the company, they must comply to the informational needs of the others users, and it must also provide the correction of accounting estimations and evaluations.

In the same time, we also notice the fact that the extension of the number of users, calling for account information, determined the development of the volume of requested information, and also the exercitation of a constant pressure on the transmission process, concordantly with the intensification of company responsibility concerning the quality of process in its hole.

The existence of a dominant factor, concerning the production and communication process of account information, in every economic system, the investors in capitalism and the state in communism imposed in accounting concepts fundamentally different. Depending on the governing methods, the other parties interested in the company evolution can built an against-power factor and can have a certain influence in building the account information. These aspects are important, because the way they manifest the power, in accountancy, the dominant factor, but also the rest of the secondary factors from the economic-political system, impose the choice of a certain accounting system, a certain type of accounting, and also the recognition of certain accounting principles and evaluation basis.

In its conceptual accounting frame IASB[4] imposes neutrality as a feature of the quality of financial situations, mentioning that "*In order to be credible, the information enclosed in financial situations had to be neutral, namely lacking any influence. Financial situations are not neutral, if by selecting and presenting the information influence taking any decision or formulating any reasoning in order to obtain result or a afore determined objective*".[5]

Even if it is requested to respect the neutrality as a quality criterion, we ask ourselves to what degree this desideratum can be reached in the conditions when the existence and different definition of some fundamental concepts in accounting make the account information a product characterized by subjectivism. On the other hand, in the same context, there must be emphasized the fact that implicitly or explicitly recognition of a user dominated (privileged) by account information represents another argument in favor of subjectivity, because admitting the existence of several categories of users, whose information needs are antagonistic, but elaborating a single set of financial situations, neutrality is disputed.

3. Conclusions

In this context we keep the social-cultural stake represented by the accounting and social consensus generated by it, as "*What is received from accounting is not an absolute truth, but more of a fact to which all parties can hold by, even if temporally and under a certain reserve*"[6].

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ACTUAL CONSIDERATIONS CONCERNING THE INDIVIDUAL CREDIT RISK

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Abstract:
The credit risk is one of the most dangerous category of banking risks because it covers a wide range of products and services. In the last years we were the witnesses to an intensification of the negative impact of this kind of risk at the international level. In the transition economies, the credit risk's potential was overdimensioned by the various evolutions of the companies and their debt level.

Key words: credit risk; bank lending;

1. Introduction

Any credit represents an anticipation of future payments. From this perspective, the stream of receipts, any credit bears the risk that these payments to partially made or not at all. This risk is also known as creditor's insolvability risk; it is essential in banking as a bank main function is to grant credits. Therefore, the correct estimation of the credit risk is of great importance for a bank. As it is easier to prevent than to fix, in order to reduce the risk exposure, the most important stage in the lending process is to select the credit applications.

In this phase a bank behavior can be presented as follows: a credit can not be granted only if it can be estimated that the payment possibility exceeds the non-payment one. The estimation of payment capacity can be made, based on various procedures, depending on the debtor: economic agent, private person, state.

The credit analysis represents the evaluation process of the credit risk. The credit risk must be appreciated depending on what the bank expects to obtain pursuant to this credit. The lending process is likely a profit bearer; the later being classified in two categories: direct profits and indirect profits.

Direct profits are immediate and, frequently, quantifiable. The most important ones are the interest and the bank commission. To these is added the client account minimum credit balance, a balance representing the credit guarantee.

Indirect profits are more difficult to quantify and doubtful. Granting a credit can also call forth to begin and maintain a relation, a deposit growth and also an increase for requesting other bank services. All these profits must be taken into consideration when analyzing the risk exposure and, eventually, accepted.

2. Credit analysis is a process which must be periodically run: before the credit in order to take the lending decision and then, depending on the credit term, at determined time intervals, usually when the client financial reports are made available.

The determinant elements of the individual administration risk are the following: payment capacity, debtor character – his will to make the payment, the capital – the debtor's belongings, guarantee (real or personal), environmental conditions. Among all these five factors, the first one is the most important.

It is though that the main weaknesses in estimating of the credit risk are of internal type: faulty selection of files and improper internal supervision of the evolution (actually of the involution) of the debtors' quality. The risk of improper file selection can be reduced by: rigour concerning the file content, internal appreciation of the clients' quality on unitary basis, by score, double agreement of the lending decision and establishment of a tolerance correspondent to the perceived interested.

There are high value credits and various ones concerning the maturities, destinations, guarantees. For a long time their selection had been exclusively made depending on the experience, interpretation of information and the business feeling the bankers have. Also now there are two *ways* to handle a credit application: the classical approach and the modern one.

In the classical approach there are evaluated and compared two elements: *the financing needs and the credit application*.

The financing needs can be for investments or for exploitation.

The investments financing needs are characterized by high values and the punctual character of the application. The file for the investment project can be elaborated by the company (potential client), by an expert or even by the bank. The elaboration of the file for the client investment project is the preferred method, if the bank has enough resources and the necessary expertise (qualified personnel). This is the most advantageous solution as it provides additional profits for the bank, the implication of its own specialist in evaluations of investment projects and a uniform data base which allows the establishment of a unitary algorithm for evaluating the clients' projects.

The analysis of the financing need is performed in a provisional financing plan: there are analyzed the needs and the perspective, gross, financial resources, then completed with banking credits. For this type of projects the prudence rule which must be observed is that the bank must never finance entirely the client investment project.

The financial needs of *current expenses* have other characteristics: have smaller values and are relatively permanent. These types of needs can be determined by planning the working capital or inside the treasury plan. It is absolutely necessary that the bank clerk responsible for the relation with the respective client to check both the information and the algorithm which stood the basis of the financing need. Afterwards the banker can propose an adequate "financial montage", namely a combination of short term credits to cover the client need for financing.

The second stage in the credit analysis using the classical approach is the study of the credit application. The analysis of the associated risk means implicates to follow the next stages: identification, evaluation and prevention of credit risk.

The identification and evaluation of the credit risk means to define it, the major causes of risk and the quantification of the risk exposure. The credit risk is caused by disturbances in the cash flow forecasted when analyzing the lending application. For each debtor these disturbances can generate insolvability. The factors generating insolvability can be classified into external factors and internal factors without being able to make the difference between the two categories in respect to the amplitude of risk exposure generated.

Internal factors are almost entirely associated to a faulty management: that is why, the appreciation of the professionalism of the management team or of the partner himself (in case of small companies), is a highly important element in the analysis process of the credit risk. Also, one must appreciate the debtor character – his will to make payments implicated by the credit granted. This is extremely difficult to appreciate in case of new clients and needs extensive information.

External factors – related to client – can be classified into political, economic and banking factors. They act over an entire group of clients and, that is why, their evaluation and identification is made for sectors of activity, by the bank specialists, using also internal information. Small banks can buy analyzing services from the bigger institutions or from specialized researched institutes, but, in this case, they can not use the internal information protected by the bank department.

The traditional approach is based on relatively laborious procedures and has a series of restrictions which can not be easily ignored: most decisions are preponderantly subjective, the information analysis is sequential, and the process last longer and has a higher cost.

The modern approach of the credit analysis is based on credit scoring. The credit scoring represents the credit evaluation based on score.

By introducing and generalizing the evaluation based on score it was intended to achieve some specific *objects,* among which:

- increment of credit quality by formalizing and imposing unique credit norms;
- reduce the evaluation cost by standardizing the procedures and by using the expert systems or some algorithms;
- increment of productivity and inspectors satisfaction by eliminating routine activities, the increment of their responsibilities;
- improvement of the performances for the control procedures of credits, inspectors, operative units;
- facilitate the changes in the credit strategy;
- clients selection depending on quality;
- formalization of procedures and minimization of subjective errors and risks.

The current operation of the evaluation based on score supposes the observance of the following stages:

- the identification of the main features of the credit file; among these there must be selected maximum ten, due to their relatively low degree of variables independence (statically speaking);
- the percentage of the selected features;
- (re)calculation of the credit score by cumulating the attributed points;
- establish the category to which the credit belongs to.

In the stage of implementation of the evaluation system are essential the procedure to establish the limits and the model testing.

Lending the private persons represent a different banking domain although, for a very long time, lending someone, especially on short time, seemed suspicious as the life over the means one can dispose of. Traditionally, families usually degage an surplus of financial resources, and appealing to credits was an exceptional phenomenon, generated by unique events, as buying a house or a car. The credits grated to private persons are not so profitable for banks and only the reduction of traditional markets determined the banks to extend also in the area of credits for private persons. In Romania this market is little developed, where are dominating the banking traditional activities to credit the companies, sufficiently profitable activities, due to the lack of a normal development of the financial markets to facilitate the direct transfer of financial resources. But it is expected that, once the rise of population real incomes, the re-launching of economy and extending the companies use of other financing methods different from the credit, the banks to direct also toward this domain to fructify the funds they are administrating. Moreover, these small values credits are quite diversified in portfolio by destinations, guarantees and debtors.

The credits contracted by the private persons are of two types: short term credits to cover any temporary gaps between the incomes and expenditures and long term credits for financing real estate investments. In order to analyze the clients credit files, the banks are using two *methods:* classical approach and the modern one.

The essence of the classical approach for analyzing the private credit consists in appreciating the applicant repayment capacity, so that the instalments (including the interests) to be reasonable in comparison with his average incomes. Most of the time, granting the credit also implies the constitution of certain guarantees for the possible case when the risk of insolvability may occur. In case of private persons files, the analysis for the financial needs is minimum, as it follows, in case there is an object to be credited, its value to be real, but this stage is imposed more by the need to check the guarantees offered, for the cases when the good purchased is the guarantee for the creditor. Therefore, the essence of the analysis process of the credit is the analysis of the credit application.

Depending on their destination, the short term private credits are consumer credits and personal credits.

Consumer credits are granted for purchasing goods with installment payment, goods which generally represents also the credit guarantee. On the market of these types of credits the banks are highly concurred by consumer credit companies and credit cooperatives.

Personal credits are usually restricted no matter of the clients' incomes and the credit destination, because these informations are not even requested by the bank. It lends a certain amount

(a limited offer, usually twice-third time the average of monthly income) with a precise maturity and an interest of the installment relatively high; the client can use the money as he likes on the condition to repay at the maturity; this is a developing market where banks run an aggressive competition.

Identification and evaluation of the insolvability causes is done for two distinct groups: objective causes, referring to the activity environment and the subjective ones referring especially to client character. Depending on the nature of incomes (salary or others), of their quantity and periodicity, of the existence for other payment commitments and of the client character, the bank can establish the payment possibility is highly enough in order to grand the credit.

The protection is performed differently depending on the causes; for the *objective,* environmental, important is the existence and the permanency of incomes, but also the repayment capacity. There are three practical *rules* for reducing the short term credit risks by analyzing the client credit application: the credit must have a reasonable value, there should be stable sources of income and there should not exist any previous payment incidents. The observance of these common sense rules can not guarantee the entire repayment of the credits granted and also the fact that the solvable creditors can not be rejected, but it eliminates the most of the repayment incidences.

For middle and long term credits its scope is to buy or to perform works to real estate assets.

The credit value is sensible higher for short term credits. The causes of insolvability are the same as with a probability of a higher occurrence, because it is a long term credit. The protection is more difficult to be performed, because the longer term raises the incertitude, referring to both the incomes and the debtor behavior. So, it is imposed the request for guarantees under the form of life insurances for debtor and the bank as beneficiary and under the form of mortage and other forms for legal guarantees.

The moderate approach based on credit scoring sees to synthetize the non repayment risk by means of a note. The procedure is usually used for short term credits so that:

- these credits have smaller values, so the analysis of the file can not be expensive;
- the files must be solved quickly because the applicants would like to know the answer as soon as possible, so that they can eventually apply to another bank;
- the debtors should have a certain behavior integrity, so that the decisional criteria to be valid for all and to come on scoring based evaluation;
- also the credits, in their turn, must be comparable as amount, scope of the credit and maturity so that the risk to be comparable.

3. Conclusions

The organization and the structure of the lending process for private clients can be used as effective instruments in reducing the risk exposure. Their conscious use in this precise scope stands at the base of the actively preventive administration of the client risk.

The classical approach in this domain (the relative way to administrate the lending process) is based on the direct organization of the lending activity at the level of two bank departments: the desk or front office charged with the elaboration of credit files and sorting them and the private credit office or the back office which provides the administration of the events subsequent to credit approval, during the progress of the relation with the debtor. In this context the risk administration is concentrated at the level of the front office where files are being selected using various procedures among which credit scoring and protection against risks is provided by requesting the traditional guarantees.

Once the lending process is initiated, the incidences are handled as a department for debt collection and only the worst cases drive the start of a legal department dangerous for the institution (high costs). In the crisis periods is registered an accelerate rise of the numbers of files with problems. The classical reaction of credit institutions implies on one hand, the modification of evaluation limits based on scoring, and on the other hand the rise of effectives assigned to the department of debt collection. This group of answers represents a reactive way of action only after the incident took place. This is a dangerous policy, because often is too late to be able to recover the entire debt, and the expenses can be significant (in comparison to the credit amount). Therefore the chain of file administration starts with it elaboration by the front office personnel. The identification and the

evaluation of the risk are generally made and depending on this general evaluation, the bank involves itself or not.

In the second stage of granting the credit, the administrative services take over the file from the commercial department. Then the bank crosses from a general view over the client to an operational one, in respect to bank commitment to cover the whole or part of the client request.

The third stage supposes the actual administration of the credit file and begins with a transfer of responsibility to the back office team. The team is responsible for the normal progress of the lending process and the events administration during the file validity period: funds release, payments registration, (possible) postponing of maturities.

This administrating method finds its explanation in the relatively low costs for the implementation in normal periods and in personnel specialization.

The modern approach (active method) is based on the necessity of intervention before the event takes place, anticipating the risks and therefore permanently updating the clients' status depending on the updated information.

The fundaments of this method to handle the clients' files are the following:

- the risk must be controlled acting at the client level before the incident takes place;
- the bank anticipative action must consolidate the image of counselor and client supporter;
- the permanent file update offers the bank a competitive advantage resulting from the exact knowledge of the client status.

Actually the bank extends to the processing of the private persons files the approach method used in the relation with big partners, as companies. But this fact is only possible in the case of a integral information concerning the file handling procedures.

The principles which the preventive administration of the client risk is based on are the following:

- the existence of a single criterion for the evaluation of a risky situation: client risk (predominant over the risk of non repayment at maturity);
- using a system of synthetic indexes for signaling the significant deviation from the initial quality of debtor as a client;
- pursuing to enrich the activity not to suffocate it; the verification system must be simple, elastic in order to allow the exceptional processing.

The implementation of a preventive administration system concerning the client risk supposes the progress of an entire range of operations. It is also essential to define the information necessary for a typical client file and the data base out of which one can obtain any necessary information. The list containing these information should be correlated with the personnel informative possibilities and the initial documents out of which these information are taken should be precisely indicated, documents which should be available for the bank and which the client have to update any time there are any changes. Afterwards it follows the establishment of synthetic indexes based on which is taken the credit decision and the decision of intervention in the progress of the lending process. For each of these is established the calculation algorithm, is set up the content of the data base to be processed and are established the limits of tolerance or the filters; the later must be periodically revised and updated depending on the markets evolution and the bank lending policy. The third stage consists in establishing the presentation methods of the results. This presentation must be characterized by accessibility, rapidity and simplicity. If these conditions are fulfilled, then the finite product is useful and contributes to the simplification of current activities. The final stage consists in updating the information contained in the data base and used by back-office. The updating can be periodical or exceptional, as established according to the lending policy. The updating must be coherent and reliable because it supposes the replacement of some data which stand at the base of calculation algorithms which fundament decisions.

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THE IMPLICATIONS OF THE COMMERCIAL TRANSACTIONS THROUGH SETTLING UP IN THE CONDITIONS OF INTERNATIONAL ECONOMICAL GLOBALIZATION

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Abstract:
The tendency of passing from the internalization to the globalization of the economic life was an outstanding feature of the business background evolution on worldwide scale- during 20th century. This tendency was to be noticed in the field of the commercial transactions (the spreading out of the world commerce), of the foreign investments (output internationalization), of the organizational business structures (firm internationalization).

Keywords: settling up; commercial transaction; international economical globalization; internalization; GATT/OMC

1. Introduction

A characteristic feature of the business medium's evolution on a world scale – in the second half of the XX century, has built the tendency to pass from internalization to globalizing the economic life. This tendency has subscribed also in the commercial transaction domain (the world commerce expansion), of investments in foreign countries (product internationalization), of organizational business structures (the company's internationalization).

In the last decade, under the influence of numerous factors of economic, technologic and politic nature, the internationalization process has entered a new phase that of emerging a global economy, built on an interdependence system in commerce, production, services and the financial domain.

Actual world economy is characterized by a new technological base, by extending and intensifying international commercial transactions, modifying the rapports of force in the economical and political-military plan and a new modality of defining the relation between national and international.

2. Methodological Background

Showing the economic relationships on a world plan and creating an international business medium was realized by two big processes: the growing world commerce and fast development of the investments in foreign countries.

International commerce has known, in the past two decades, a powerful and almost constant expansion, devastating the growth of the industrial production, and PIB on a world scale. This way, in 1950-1998, the world commerce has grown (in constant prices) for 87 times, while the industrial production has grown 9,5 times, and PIB by 8,5 times. This means that, for the world countries, a large part of production is realized by exports and imports that the interdependence of the national economy in the productive and commercial domain has intensified.

Accentuating international interdependences by the commercial fluxes results from a major mutation, which has took place in the world commerce domain: the pass from structures and reports of base products type contrary to manufactured products (intersectorial interdependences) and than to changing the products in a frame of branches and under branches of industry or in the frame of a group of products (intraindustrial interdependences). The developing of the intraindustrial commerce reflects the process of progressive deepness of the international division of work in the decades after closing the last world configuration.

On the other hand, statistic dates concerning the geographic distribution of world commerce shows us that the internationalization process has not developed in a homogenous way in the frame of

the world economy. Indeed, in the year 1998, the different procedures of groups of countries in the international commerce was the following: developed countries 66,6%, countries still developing 29,6%, countries with an economy in transition 3,8%. The difference between the groups of countries is more accentuated if we refer to the changes in the manufactured/industrial products; in this case, the numbers are the following: (Export) developed countries 71%, countries in development 25,7%, countries in transition 2,9%.

And so, the internationalization process was realized integrally on the globe, a powerful concentration of the interdependence between the developed countries being manifested, in the race in frame of the USA "triads" – Occidental Europe – Japan. The weight of the three in the world commerce in the year 1997 was the following: occidental Europe 37%, USA 14,7%, Japan 7%.

3. Main factors with effect in developing the commercial relationships in the contemporaneous period

Developing the commercial relationships in the contemporaneous period was the result of numerous factors, in which we remind:

- Technical progress, which has had direct impact and over the international commerce. If since the '60s it was talking about the pass from industrial society to the post-industrial society, hardly in the past two decades the nature and accounts of this become to be visible. In the economic domain, these are synthesized in the "informational economy" collocation, which is based on new technologies.

Technical progress determinates in a direct way the depth of the international division of work, studying more and more the intra-industrial and intra-product type specialization; on the other hand, this impact is limited to the countries and zones in which is affirmed and valued the technological advance. In other words, the international commerce is extended there where conditions needed exist for manufacturing the technical progress. On the other hand, actual technological developments, especially in the industry domain of elaboration, tend to modify the premises to compete in the international businesses. So, the countries which are based on intensive industrial exports in manual labor risk losing, in terms of competitive position, in the new conditions on the world market. Concomitantly, the new material industry departures the natural limits of the growth and reduce the rent associated to some products considered irreproducible.

- The accentuated production of international commerce, in the second half of the XX century was owed to tendencies of imposing liberalism. The economical performances obtained in the occidental countries by promoting the market economy and, in contrast, economic failure of the command at the end of the '80s, have represented a clear argue and economic doctrine.

The fast development of the international commerce was valorized by the freechangable orientation of the commercial politics in the main countries participating at the world market. At the same time, following the export successful example of Southern-East Asia (Japan, South Coreea, Taiwan, etc.) a huge number of developing countries have adopted economic growth strategies based on the export stimulation.

An essential role in eliminating the tariff and untariffed barriers from the international commerce way has revert GATT/OMC. In exchange, the United Nations Conference for Commerce and Development, which has purposed to contribute to the instauration of some more equitable relations between North and South Coreea and promote an international commerce put in the growth and development service, has entered, after a period of intense militates, in the '70s, in a persistent cone of shadow.

- Liberalization of commerce in the last decades of the XX century, it is shown in the following distinctive characteristics: it has a starting point the developed "center" of the world economy, constitutes a dominant tendency on a world scale, even if the elements of protectionism are meet in the realities North-North and even in North-South; they have a base institutionalized on a world level, represented usually by OMC and other organizations of global or regional vocation; it is applied not only in the commercial relations domain, but also in the one of financial international relationships.

- Another contributing factor to the development of international commerce is represented by the processes of economic regional integration. If these processes have been taken in different forms and at different intensities in the developed world and in those in transition, the greatest example is represented by the integration of the East European countries in the European Union.

The integrationist organization has proven that, in a short historical period, a special capacity of training new members, which reflects the expansion tendency of the project at a continental scale. More to that, the European Union's performances demonstrate the deep progressive integration in the intra-communitarian space and, in parallel, the growing role of the Union as a centre of economic and commercial power in the world economy. Statistic dates confirm those above. This way, the ponderation of the European Union in the world commerce was 40,4% in 1991 and 37,6% in 1998.

In what concerns the outer investments we can appreciate that these differ from the international commerce by many aspects. If the commercial relationships presume interdependence between parts of money-product relationships (supply-market), outer investments create and develop direct reports in the production domain. Economically, an investment in a foreign country implies an option for internationalizing the economical activity, in the character of products, goods and services.

Analyzing direct outer investments, we observe that these purpose the implication of the investor in the company's management in the host country, him taking part of the apportionment of the profits and the business risks. This can be realized by funding a new company, or buying a set of actions from a company of the foreign country. In a conventional way it is considered that the acquisition of a cote of over 10% of the social capital of a foreign company represents a direct investment.

If the commercial operations are based on the relation of type debtor-creditor, the outer investments lead to the stabilization between partners of some reports based on the spirit of association.

The partners are associates, not buyers or sellers, and have in the background of the company a position determined usually by the cote owned in the social capital. And so, the business relationships don't have an impermanent or strict character limited by time, but to gain a durability and permanence character.

As it is known in the second half of the XX century, the process that indicates the increasing of economic interdependences has carried on in more stages: the 50'-70's, characterized by the expansion of the international commerce; the 70'-80's, in which the international financial relationships gain a special importance; the 90's, in which the passing from internationalization towards globalization in world economy takes place.

A series of aspects of the social-economic life from our days reflect the process of globalization: the global nature of science and technology; even if the main sources of the technical progress are concentrated in the developed world, the scientific research is based on global resources, and putting the technology to application concerns global interests; the global marketing: the marketing strategy of the companies respond to the globalization requests and promote this process (universal marks, ("focusing" the consume, advertising culture etc.); the world financial system: the "symbolic" world economy is based on a network that implicates, at a global scale, the bank institutions and the capital market agents, national reglementation systems, international finance systems etc.; the communication infrastructure: the technical progress has permitted to perfect the material communication systems (transports), the realization of a mass-media cover at a world scale (CNN) and, especially, instituting a global network of transmission/reception of information (INTERNET); the world institutional frame: a series of organizations of governmental nature (the ONU system) or nongovernmental (ONG) promote the discussions and actions that concern the global problematic: pollution, criminality, sub-development etc.

The main economic processes that sustain the tendency of globalization are manifested in the domains of production and services (generally, financial); and the fundamental promoter force is the multinational society.

Under the impact of the determinant factors of the internationalization process it has been produced a growing expansion of the international division of work, with the tendency to construct a system of interdependences on a global scale.

Even if in the post-war years it has been determined a zone of large concentration of exchanges – "the triad" – in the world work division network there have been attracted progressively new states and groups of states: the new industrialized countries, and, in the last decade, the Middle and East Europe countries. This state of things demonstrates that globalization is the formation of a global economy that involves regional specificity.

The process of globalization is simulated also by the interdependent development of international commerce and the outer investments in foreign countries. Compared to other historic times, at the present more and more companies, and firstly the multinational societies, adopt business strategies that involve directly the global state, the world market in ensemble. In the frame of these strategies, there are practiced different forms of international transactions – from the category of commerce, of cooperation or forms of implantation – or combinations of these.

Globalization is helped by the creation of commerce effects too, which are generated by different regional integrationist groups or institutional arrangements – or multilateral. These because in the conditions in which there is manifested a strong tendency of fond towards globalization, all the regional concentration zones of commerce or international arrangements made to simulate the companies to compete tend to be attracted in the world commercial circuit and to be subordinated to the dominant trend.

The essential role of globalization is constituted by the multinational society. By the available data in the middle of the past decade of the XX century, in an average of 45% of the total selling of the multinational societies are represented by exports; these societies control almost totally the international commerce with base products; and the finite industrial product markets are mostly global (meaning electronics, the main powerful industry in the productive annual system).

On the other hand, since over two decades ago a substantial cote from the developed countries exports (above 50% from the American exports, almost 80% of the Britannic exports) and of the new industrialized states (over 90% for Singapore, above 40% from Brazil) are generated by multinational societies. From where the conclusion that "world economy is formed so by the process of market globalization".

If the development of the international commerce reflects the extension process of the international division of work and market globalization, the remarkable growth of the importance of intra-industrial commerce (in the frame of some industrial subsides, of some groups of products or intra-product) expresses the process of depth of international division of work.

To this process correspond tendencies of world integration of production, which is generated and controlled by the multinational societies. The cote from the internationalized production (estimated on the base of the multinational societies activities volume in the country of origin and the selling of their subsidiaries in foreign countries) reached in 1998 32% of PNB for USA, 24% for Japan and 42% for Holland.

The main mechanisms of internationalization and globalization of production are represented by: the productive valuing of a technology in foreign countries by license or other forms of transfer of technology towards mixed societies, subsidiaries or branches from third countries; delocalization of production by subcontracting and creating an international productive system of cooperation in productions at an international scale; realizing fusions and acquisitions constituted by large industrial groups at a global scale.

The internationalization of production is doubled by the internationalization of services, in a process that reflects in the world economic circuit the post-war tendency of growth of the third sectors importance again, in report with the secondary sector, in economy. And in this process the multinational societies play the role of driving forces. These processes are tightly bounded, so that we can talk about a kind of third-industrial global complex. The new technologies tend to industrialize the production of services and to thriven the productivity of goods. Two categories of services have contributed in a decisive way, especially in the years 80' and 90', at globalizing the business relationships: the consulting and financial ones.

4. Conclusions

The third and multinational societies have begun implicated more and more in transactions by the financial international markets; they are diversified towards financial activities, they are "financializing". Even this diversity of activities – industrial, third, financial – integrated in a network of conglomerate fives the specific of global multinationals.

On the other hand, the financial operations of the large international banks and the multinational societies drive to integrating the international financial markets, and the capitals movement tends to become in a large state autonomous, in report with the finance of production and exchanges.

A financial global private system is in course of becoming a structure, including the network of multinationals, commercial and investment banks, Euromarkets, markets of derived financial products, the large financial world markets, which show generally the process of internationalization and globalization of international commercial transactions with all the consequences for the participants at the stages.

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DURABLE DEVELOPMENT AND GLOBAL EVOLUTIONS

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Abstract: *The academic and scientific world, in solidarity becoming emblematic, it was and remains sensible to social, economic and moral challenges, making generous efforts for finding reasonable and appropriate solutions, capable to release the stress of conflicting state of facts until it is not too late. So, after a long period of time it analyzed major problems as: unemployment, inflation, interests, external debts, competition, international working division and budgetary deficits, aspects concerning the theory and economic practice, for which classical explorations provided satisfactory answers, now there is the time for ultimate questions, one more awkward than the other.*

Key words: durable development; resources; environment;

1. Introduction

The first preoccupation is the one for *natural resources,* inevitably limited and exhaustible in a predictive time interval, especially the non-regenerative ones, as petroleum and mineral substances used in metallurgy of iron. Discovery of substitutes, exploitation of marine nodule, exploration of universe in trying to identify resources on other planets, and also the recycling of the ones presently used on Terra sees to be the short term refuge solution and, at most, middle term solution, in the event of proving the political will for cooperation in the domain and for organizing the present production as a "closed circuit": *natural resources → production → consume → environment* [3].

Even if there are a few encouraging signs in this respect, the chances are not irrevocably and definitively compromised, as there are still certain possibilities to reach last moment agreements, based on transfer of knowledge and technology. It is important – in our opinion – the fact that the artisans of valid economic developments – governments and private entepreneurs – seem to have acknowledged the imminent dangers if they do not take into account the conclusions reached by the researchers. As a proof we have the remarkable works already published, true "warning signals" followed also by certain specialized institutions (ONU, FMI, BIRD or the Club in Rome, Worldwatch Institute of Washington D.C., etc.) and by civil society, being apparently deranged and concerned by certain political, social, economic and moral evolutions.

A second problem aiming the gaps induced by the *uncontrolled population growth*, being, without any doubt, a much more complex and delicate problem, concerning beliefs, traditions and customs which make compromise and toning extremely difficult, if not impossible.

A conclusive indicator of durable development and, in the same time, of its economic and human dimension, is represented, without any doubt, by the level to which the members of society can satisfy their needs and aspirations and at what costs, expressed in lost possibilities and wasted human resources [6, page 195]. This is, in the same time, an indicator capable to provide incomes for purchasing the goods necessary for the private and professional life of which depends the social harmony, human solidarity and, generally and finally, the performances registered in material and spiritual creation. Even if we admit it or not we find ourselves in a dual situation.

On one hand, education and knowledge acquired in school and family compose the main element of human capital at the physical and intellectual level.

On the other hand, the economic performances influence the demographic variables, having a determinant character. Because of this, the rigorous prospective approach, having pertinent

conclusions and useful to decision factors, evidently has to start from the accurate knowledge of the trends of relevant indicators, starting from the identification of causes and correct appreciation concerning the component systems status of durable development. There was also necessary to present the evolution of certain indicators at the world level, during the period 1950-2000 and at the beginning of third millennium. The statistic information has as sources two well-known works: „Vital signs", published by Worldwatch Institute (SUA) and World Development Indicators, 2001, published by the World Bank. A series of punctual estimations belong to certain well-known specialists, as Lester Brown and Bertrand Schneider.

2. Demographic evolution. The analysis and prospective scenarios elaborated start from the facts considered to affect directly and greatly the economic progress, exacerbating all other social and environmental problems, respectively from the demographic growth.

The analysis concerning the entire evolution of population from the last part of the century, indicates that the demographic explosion was one without precedent along human history, in about 40 years (1950-1990) it was registered a duplication of the number of inhabitants of the Planet. The dynamism of the phenomenon is also evidenced by keeping the average rhythm of annual growth during the 1950-1970, which would have duplicated the number in 35 years. Even if, in the last decade, the annual average natural growth registers a decreasing tendency, and keeping the tendency during the period 1950-2000, it will lead, around the year 2040, to the duplication of the population existent at beginning of this century, although a series of authors [2 page 152] consider that this number will be reached sooner (about 15 years).

Relatively recent prognosis [1 page 3], more pessimistic, estimate that the population of the Planet will reach 8,9 mld. individuals in 2050. These last prognoses take into account the fact that, until now, the growth took place in developed countries, as also in developing ones, but in the future it will tend toward stabilization for the fist group of countries, and almost the entire growth will be registered by the countries in the second category.

Also, for developing countries, where there were preoccupations for maintaining under control the population growth, there are examples of states where the population growth is close to stabilization (table 1), as it results from the most recent prognosis:

Table 1. Evolution and prognosis of population growth for developing countries in 1999 – 2050

	Total population (mil. pers.)		Growth (%)	Natural growth (%)
	1999	2050		
North Korea	46	51	5	+11
Taiwan	22	25	3	+14
Thailand	61	74	13	+21

The same prognosis also mentions the developing countries (table 2) where birth rate remained relatively high, existing premises for a dangerous demographic spire:

Table 2. Evolution and prognosis of population growth for developing countries in 1999 – 2050 where birth rate remained relatively high

	Total population (mil. pers.)		Growth (%)	Natural growth (%)
	1999	2050		
Ethiopia	61	169	108	+177
Nigeria	109	244	135	+124
Pakistan	152	345	193	+127

In general, the governments of the respective countries, after a long period of time with strong demographic growth, were really overdue by the situation, facing in the same time with problems concerning the education, health, jobs, food, effects over the environment.

The situation aggravated each time when in these countries took place natural disasters – drought, earthquakes, etc., or epidemics. The effects of these evolutions materialize in aggravation of

poverty, general aggravation of life conditions, degradation of the environment, tensioning of social relations etc.

The medium term previsions made by the World Bank in the demographic domain (horizon 2015) emphasize new aspects on group of countries depending on the per-capita income per inhabitant (table 3):

Table 3. Prevision in the demographic domain (horizon 2015)

	1980	1999	2015	Growth rate (2015/1999 %)
World total	4430,1	5978,0	7084,3	1,1
Countries with low income	1612,9	2417,1	3086,1	1,5
Countries with per-capita income	2028,1	2664,5	3055,0	0,9
- inferior environment	1607,9	2093,0	2382,8	0,8
- superior environment	420,2	571,5	672,2	1,0
Countries with low and per-capita income	3641,0	5081,6	6141,1	1,2
- Eastern Asia and Pacific	1397,8	1836,6	2097,3	0,8
- Europe and Central Asia	425,8	474,4	478,1	0,0
- Latin America and Carribean	360,0	508,2	621,6	1,3
- North Africa and Middle East	174,4	290,3	389,7	1,8
- South Asia	902,6	1329,3	1676,3	1,4
- Sub-Saharian Africa	380,5	642,8	878,1	1,9
Countries with high income	789,1	896,3	943,2	0,3
Countries of European Monetary Unit	277,0	292,8	290,1	-0,1

Source: The World Bank: „World Development Indicators", 2001, Washington, page 44-47.

Note: The World Bank classifies the countries depending on their gross national income per each inhabitant as follows: countries with low income (under 755 $/loc.); countries with per-capita income (between 756 $/loc. and 9265 $/loc.); low per capita (between 756 $/loc and 2995 $/loc); superior per-capita (between 2996 $/loc. and 9265 $/loc.); countries with high income (over 9265 $/loc.).

In the class of the countries from the European Monetary Union are also included the member countries with a gross income per inhabitant over 9265 $/loc.

Pursuant to distinct demographic evolutions, the population percentage from the countries with low income per inhabitant raised from 36,4% in 1980 to 40,4% in 1999, the predictions estimated for 2015 being of 43,6% from the Earth population. On the other extreme, the population percentage from countries with high income dropped from 17,8% in 1980 to 15,0% in 1999, the estimations for the prognosis year being of 13,3% from the total population.

Among the countries with low and per-capita income, the ones from Africa and South Asia registered and will register until the prognosis horizon the biggest increments are way over the world average. The developed countries – the ones with an income per inhabitant of 9265 $ - will register practically an insignificant raise tending to stabilization.

Form the countries analysis referring to population dynamics we note that, in twenty years (1980-1999), a series of countries registered the doubling of population, for example: Jordan, Saudi Arabia, Yemen, other being close to this level (Congo, Iran, Iraq, Madagascar, Niger, Nigeria, Pakistan, Tanzania).

Among the countries with a numerous population, the most important birth rates estimated are – in 2015 in comparison to 1980 – in: India (+535 mil. persons), China (412,5 mil. persons), Pakistan (+110,7 mil. persons), Indonesia (+102,2 mil. persons), Bangladesh (+80,0 mil. persons), Brasilia (+78,1 mil. persons).

There must be mentioned that the sixth countries "hold" half of demographic growth registered between 1980 and 2015.

3. Gross World Income – total and per inhabitant.

In correlation with the demographic evolution there must be also analyzed the economic growth, illustrated synthetically by the growth of the gross world product – total and per inhabitant.

The first observation results from the analysis of the respective data consisting in the fact that, while the entire population registered a growth of 2,4 times, during the period 1950-2000, the gross world product increased 6,75 times, resulting an increment of the gross world product per inhabitant of 2,8 times. For ten years time intervals, the most dynamic period was between 1960-1970, the annual average rhythm being of about 5%, while during the period 1985-1995 it was registered the slowest growing rhythm – only 2,8%.

On countries groups, in 1999 (table 4), the situation was the following (The World Bank uses, for the above mentioned paper, the gross national income and the gross domestic product; data per inhabitant in dollars to the par of exchange of the buying power is only the first indicator):

Table 4. Gross Nationl Income and Gross National Income per Inhabitant, in 1999

	Gross National Income TOTAL		Gross National Income - Per Inhabitant	
	tril.$	tril.$ppc 1999	$	$ppc 1999
World total	30,0	41,2	5020	6870
Countries with low income	1,0	4,5	420	1870
Countries with per-capita income	5,3	13,8	1980	5200
- inferior environment	2,5	8,9	1200	4250
- superior environment	2,8	5,0	4870	8770
Countries with low and per-capita income	6,3	18,3	1240	3610
- Eastern Asia and Pacific	1,9	6,9	1010	3740
- Europe and Central Asia	1,0	2,8	2160	5980
- Latin America and Carribean	1,9	3,4	3800	6620
- North Africa and Middle East	0,6	1,5	2060	5000
- South Asia	0,6	2,8	440	2110
- Sub-Saharian Africa	0,3	1,0	490	1500
Countries with high income	23,7	23,0	26440	25690
Countries of European Monetary Unit	6,5	6,5	22250	22180

It is noted that the countries with high income were participating in 1999 with 79% to the gross world income, while their population was representing only 15% of the world population.

The favorable global economic evolutions affected only in a small percentage the standard of the population from the less developed and developing countries, the number of persons living with an income of 1$/ day (the threshold of absolute poverty), as the ones having less than 2$/ day, still being too high. The predictions for 2015 are not the most optimistic ones, as resulting from the data of World Bank (table 5):

Table 5. Gross Nationl Income and Gross National Income per Inhabitant, scenario for 2015
- mil. persons –

	1990		1998		2015			
	under		under		under 1 $/day		under 2 $/ day	
	1 $/day	2 $/ day	1 $/ day	2 $/ day	pessimist scenario	basic scenario	pessimist scenario	basic scenario
Eastern Asia and Pacific	452	1084	267	885	101	65	472	323
- Exclusive China	92	285	54	252	20	9	187	115
Europe and Central Asia	7	44	18	98	9	6	58	47
Latin America and Carribean	74	167	61	159	58	43	162	133
North Africa and Middle East	6	59	6	85	6	5	80	59
South Asia	495	976	522	1095	411	297	1214	1078

	1990		1998		2015			
	under		under		under 1 $/day		under 2 $/ day	
	1 $/day	2 $/ day	1 $/ day	2 $/ day	pessimist scenario	basic scenario	pessimist scenario	basic scenario
Sub-Saharian Africa	242	388	302	489	426	361	690	637
TOTAL	1276	2718	1175	2812	1011	777	2675	2275
Percentage out of the entire population (%)	24,0	51,4	19,8	47,5	14,3	11,0	37,8	32,1

By the analysis of the above mentioned data there are a few conclusions to be reminded and which needs a series of comments. First of all, because between 1990 and 1998 the state of poverty improved at the planetary level, from the point of view of the relative values, the number of those living with an amount under 2$/ day is raising.

Among the areas where poverty is evidently raising in Europe and Central Asia, the process accentuated during the period 1990-1998. Even if the predictions for 2015 take into consideration a reduction of the number of respective persons in comparison with 1998, the situation at the horizon of prognosis shall be more unfavorable than the one registered in 1990. We believe that this phenomenon is due to the situation present in the countries being in transition to the exchange economy and due to the decline registered by the countries from the ex-URSS.

During the period 1990-1998 the number of people placed under the limit of absolute poverty increased also in other two areas: South Asia and Sub-Saharian Africa.

We have to mention that the total number of people living under the limit of poverty is higher, not even developed countries lack this category of persons. Thus, Bertrand Schneaider considers that in SUA, about 35 million persons live with less than 370 $/year, so under the threshold of absolute poverty, and in France approximate 5 million persons survive with less than 2000 French money/ year [5, page 21].

Significant aspects concerning the structure of poverty results also from the data analysis (table 6) referring to structure on areas of population included in the analyzed categories:

Table 6. The structure of poverty results
– % –

	1990		1998		2015			
	under		under		under 1 $/day		under 2 $/day	
	1 $/day	2 $/ day	1 $/ day	2 $/ day	pessimist scenario	basic scenario	pessimist scenario	basic scenario
Eastern Asia and Pacific	35,4	39,9	22,7	31,5	10,0	8,4	17,6	14,2
- Exclusive China	28,2	29,4	18,1	22,5	8,0	7,2	10,7	9,1
Europe and Central Asia	0,5	1,6	1,5	3,5	0,9	0,8	2,2	2,1
Latin America and Carribean	5,8	6,1	5,2	5,7	5,7	5,5	6,1	5,8
North Africa and Middle East	0,5	2,2	0,5	3,0	0,6	0,6	3,0	2,6
South Asia	38,8	35,9	44,4	38,9	40,7	38,2	45,4	47,4
Sub-Saharian Africa	19,0	14,3	25,7	17,4	42,1	46,5	25,8	28,0
TOTAL	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**

From the analysis of structures on geographic areas we notice the following:

a. the severe reduction of the percentage of poor population, during the period 1990-1998 and also in the perspective of 2015, from Eastern Asia and Pacific, and especially the one in China, the number of Chinese who will survive with an amount under 1$/ day dropping in the statistic period from 360 mil. to 213 mil., in order to reach the horizon of prognosis between 56 mil. – 81 mil. persons;

b. the accentuation of poverty in Europe and Central Asia, increases the percentage out of the entire population which with less than 1$/ day from 0,5% to 1,5%, and the number of persons surviving with less than 2$/ day from 1,6% to 3,5%, during the period 1990-1998. A warning system concerning the decision factors in these countries must be, in our opinion, the fact that in the perspective of 2015, the percentage of poor population from this group of countries out of the world

total of people surviving with less than 1$/ day is higher than the number of those living in North Africa and Middle East (0,8% - 0,9%, instead of 0,6%);

c. the poorest areas of the world will remain South Asia and Sub-Saharian Africa, the percentage of poor population from these areas in this category total growing from 57,8% (less than 1 $/ day) and 50,2% (less than 2 $/ day) in 1990 to about 83% (less than 1 $/ day) and about 75% (less than 2 $/ day) in year 2015. At the prognosis horizon, between 67,0% (basic scenario) and 74,5% (pessimist scenario) out of the total of inhabitants in this area which will survive with less than 2 $/ day.

According to definition, principles and objectives of durable development, is obvious that the performance of this type of society is a far objective.

4. The agriculture and its problems.

The importance of agriculture for the existence of human kind must not be proven, as we also know the diversity and complexity of problems concerning this vital sector and they represent a permanent preoccupation for the decision factors, for scientists, for manufacturers and traders.

A first problem of this sector refers to the cultivated surface, its extension being a basic preoccupation from the beginning of this activity. By its ingenious methods, using the results obtained by the researchers in the area – for example: hybridization of corn – or in the domain with major implications over the agriculture – for example: discovery of fertilizer –, the productions increased rapidly.

These facts permitted the estimation, back in the sixties, that we can relay on an affluence of food and that there is no danger generated by the growth of population. Moreover, at the middle of the past century, the land registered significant increments by means of irrigations, drainage, offsetting, dewatering, etc.

The rapid increase of population number leaded to an inverse process, causing the reduction of the land, due to the extension of urban and rural habitations, due to the development of infrastructure – especially the roads, railways and airports. The industrialization process, present in numerous countries, needed also to take out numerous surfaces from the agricultural circuit, some of them quite fertile. That is why, for example, the maximum cultivated land in Japan was reached in 1955, in Taiwan in 1962 and in South Korea in 1965 etc.

Practically, after 1950, there were registered increases of lands cultivated with cereals in two waves. First one was due to the introduction into the agricultural circuit, at the beginning of the ’50, of a surface of 25,5 mil ha virgin lands concentrated in Kazakhstan (equivalent of surfaces cultivated with wheat in Australia and Canada).

The second wave started at the beginning of the ’70 by increasing the surfaces cultivated in USA and Soviet Union. But, the respective surfaces could not be maintained in exploitation on long term, as they were belonging to the category of erodible lands. This is how we explain the fact that in USA the maximum surface cultivated with cereals reached in 1987 (123 mil. ha), dropping to 91 mil. ha in 1995, while in Kazakhstan, after providing the 25,5 mil. ha at the middle of the ’80, in 1995 there were cultivated only 18,6 mil. ha, and the surface was going to be reduced, according to local specialists, to 13 mil. ha.

Another cause for the reduction of surfaces cultivated with cereals – the most used food for humans and animals – is the increase of surfaces cultivated with oil plant, fruits and legumes, due to the raise of incomes and to the change of peoples’ request. Thus, the world soya production grew during the period 1950-1995 from 17 mil. tons to 123 mil. tons, mainly by extending the surfaces (the production for one ha increased insignificantly). In the same time, the analysis indicates the fact that the food diversification accompanying the raise of incomes implicate a raise of consume of fruits and legumes, but also of animal products.

There also must be taken into account the capability of cereal conversion into animal proteins. So, for 1 kg of bovine meat (raised in stable) are necessary 7 kg of cereals, and for 1 kg of pork meat only 4 kg of cereals. In modern poultry farms are spent 2,2 kg of cereals for 1 kg of chicken meat. For one kg of fish meat it is spent les than 2 kg of cereals. For cheese and eggs the ration is of 3:1. Also

bear is not omitted from the list of products containing the great consumers of cereals, its consume is continuously increasing.

From the analysis performed at the world level by specialist it results that countries where the population incomes raised – China being the best example – registered a development referring to food chain, the cereals consume being in a strong increase, especially due to the request of animal products.

The evolution of total agricultural production and the one for cereals was the following (table 7):

Table 7. The evolution of total agricultural production and the one for cereals

	Value of agricultural production		Cereals production	
	mld. $ 1999	Rhythms (%)	mil. tons	kg/pers.
1950	-	-	631	247
1955	-	-	759	273
1960	150,4*)	-	824	271
1965	180,8	4,71	905	270
1970	187,7	0,75	1079	291
1975	325,0	11,61	1237	303
1980	430,0	5,76	1430	321
1985	297,0	-7,13	1647	339
1990	395,0	5,87	1769	335
1995	473,3	3,68	1713	301
2000	417,3	-2,49	1840	303

Source: The Worldwatch Institute: „Vital Signs 2001", W.W. Norton & Company, New York, London, 2001

We noted that after 1985 the increase of cereals production slowed down, thus the production per inhabitant in year 2000 is at the level reached in 1975. When analyzing the cereals consume there must be taken into account the fact that the cereals production is concentrated in a small number of areas, the degree of dependence towards this is very high, any gap in performing the production in one area has influences at the world level. It is reminded the fact that, starting with year 1866, when it began the systematic meteorological measurements, the hottest 11 years have been registered during the period 1979-1996, and the first three years even in 1990. This is how we explain the fact that in 1988, the crop obtained in USA – the biggest cereals producer – situated under the internal consume, the exporting commitments to over 100 countries being performed from the reserves. The year 1996 was also a warning system concerning the penury of cereals, the world stocks being reduced up to 48 days of consume, the lowest level ever registered. Pursuant to this, the price of cereals raised suddenly, reaching the highest levels ever registered in history.

An aspect usually neglected in analysis, but having the most detrimental effect over the environment and even over the human life and health, is that the cereal production growth had been performed using chemical fertilizer – with negative influences over the soil and the quality of underground water table – and also irrigations – having effects over the quantities of water available and of water level from the underground table.

The world consume of fertilizers developed as follows (table 8):

Table 8. The world consume of fertilizers (1950 – 2000)

	The world consume of fertilizers			Consume to 1 mil.$ agr. prod. (t)
	mil. tons	kg/pers.	rhythm (%)	
1950	14	5,5	-	-
1955	18	6,5	5,15	-
1960	27	8,9	8,45	180
1965	40	12,0	8,18	221
1970	66	17,8	10,53	351
1975	82	20,1	4,44	252

	The world consume of fertilizers			Consume to 1 mil.$ agr. prod. (t)
	mil. tons	kg/pers.	rhythm (%)	
1950	14	5,5	-	-
1980	112	25,1	6,43	260
1985	131	27,0	3,18	441
1990	143	27,1	1,77	362
1995	122	21,4	-3.13	258
2000	141	23,2	2,94	338

Source: The Worldwatch Institute: „Vital signs 2001", W.W. Norton & Company, New York, London; own calculations.

During the period 1950-1989, the quantity of fertilizers used at the world level increased continuously, reaching the record level of 146 mil. tons.

Starting with 1989 the quantity of fertilizers consumed registered a decreasing tendency, as it was realized that at a certain level, increasing the quantity of fertilizers, there are not obtained anymore significant growths for the cereal production. At the same time, after this year, the alignment of prices used for fertilizers in ex URSS to the world prices (meaning a sudden increase), caused the severe drop of the consume in this country (in 1995 was used less than a fifth out of the level registered in 1989).

We must mention the fact that in certain developing states, the increase of fertilizers consume is slowing down. Although in a series of countries – India, Bangladesh, Pakistan – the quantity of fertilizers continues to grow (for example, India was consuming in 1995 with approximate 5 mil. tons less than USA, where are produced a fifth from the world quantity of cereals).

The evolution of the consume of fertilizers on groups of countries in terms of income income, according to World Bank, also evidences other interesting conclusions, as it results from the data in the table below:

Table 9. The evolution of the consume of fertilizers on groups of countries in terms of income income

	Arable surface per inhabitant (ha)		Percentage of irrigated surface (%)		Surface cultivated with cereals (thousand of ha)		Fertilizers used (hundred g/ha arable surface)	
	1979-1981	1996-1998	1979-1981	1996-1998	1979-1981	1998-2000	1979-1981	1996-1998
TOTAL	0,25	0,24	17,7	19,5	588514	679938	870	988
Countries with low income	0,22	0,18	19,9	26,1	199694	258543	290	632
Countries with per-capita income	0,18	0,23	23,4	19,7	233799	287355	985	1081
- inferior environment	0,14	0,21	31,1	22,7	169290	225384	1004	1135
- superior environment	0,32	0,29	10,3	11,8	64509	61971	952	936
Countries with low and per-capita income	0,20	0,21	21,7	22,4	433493	545899	645	891
- Eastern Asia and Pacific	0,12	0,11	36,9	37,1	141593	143963	1155	2332
- Europe and Central Asia	0,16	0,59	10,6	10,4	37380	115149	1445	339
- Latin America and Carribean	0,32	0,27	11,8	13,7	49759	47697	586	811
- North Africa and Middle East	0,29	0,20	25,8	36,2	25655	27225	422	699
- South Asia	0,23	0,16	28,7	40,8	132128	131768	360	975
- Sub-Saharian Africa	0,32	0,25	4,0	4,2	46978	80097	158	135
Countries with high income	0,46	0,41	9,8	11,2	155021	134039	1314	1264
Countries of European Monetary Unit	0,23	0,21	12,5	16,3	34399	30223	2739	2295

Source: The World Bank: „World Development Indicators 2001", Washington, April 2001, p. 132

A first ascertainment refers to the fact that in the mentioned period, the world surface cultivated with cereals increased with over 91 mil. ha, mainly due to demographic growth and increased needs for food. But this evolution is due to the increase of the surface cultivated with cereals with over 111 mil. ha in countries having a per-capita and low income, while in countries having a high income

registering a reduction of the respective surface with 21 mil. ha. The increases are located especially in the area of Europe and Central Asia (77,7 mil. ha) and South Saharian Africa (33,1 mil. ha).

The second ascertainment refers to the fact that, although the countries with low and per-capita income hold the highest percentage from the surface cultivated with cereals (73,7% in 1979-1981 and 80,3% in 1998-2000), due to the high number of population in this areas, the surface cultivated with cereals per each inhabitant is half from the level registered in countries having a high income.

A different evolution is registered for the fertilizers consume on big groups of countries. So, while in countries with low and per-capita income it increases during the above mentioned period with over 38%, in countries with high income it decreases with almost 4% (in UME countries the decrease is over 12%).

The percentage of irrigated surfaces in countries having a low and per-capita income is higher than the one registered in countries with high income is explained by climatic differences between the respective groups of countries and not by the investment power of the countries belonging to the first group.

5. Conclusions

The exploration of durable development concept represents the starting point of this paper. The durable development, a phenomenon which acquires today new equivalences, roused the interest of numerous researchers.

The preoccupation for the identification of interrelations between the human activity and ecosystems is not recent. It is estimated that reflections concerning this subject are also met in Greek and Roman philosophy, but the problem of pollution and environment protection was not a concerning reason and a constant domain of preoccupation during the Middle Age. The beginning of industrial revolution in England marks the ascertainment of the natural factor importance and posing the nature "under the eyeglass of economic research". The same source estimates that W. Petty (1623-1687), Fr. Quesnay (1694-1774) and Turgot (1727-1781) bear the merit of "raising, theoretically, for the first, the flight flag for understanding the role of nature in the economic progress".

Adam Smith (1723-1790) includes the nature among the production factors, alongside work and capital, emphasizing in the same time, the role of natural resources for economic activity and human welfare.

The XIXth century is marked by a series of fundamental papers concerning the relations between the human and environment. Thomas Malthus, David Ricardo, Stanley Jevons, Karl Marx are only a few authors for these kind of reference papers.

The concept of **durable development** appeared in a moment when problem concerning the environment were at the fore of political debates. Bu, at that time, the term of durable development is more of a collocation appropriate for attracting the support, than an impulse for the propel of changes in the environment domain. Moreover, by backing up the idea that the environment and durable development are potentially compatible, or that they represent complementary objectives, the durable development offers an expected replacement for the conflicting model which characterized the debates having as subjected the limits of growths from the 1970.

A great danger is that the simple complementary of objects is simple apparent, the concept being able to wrongly direct several politicians. Still, starting from the complementary hypothesis, the politicians are at least forced to look for this compatibility by means of certain projects carefully elaborated and by transformations of economic policy. Another danger is that, the durable development as politic objective can become diluted and inefficient.

Mainly, this inconvenient occurs, not because of the fact that the notion is based on supportability – to make things last – but it only uses the development term.

To the supportability term is added different significations. Inside a document issued by the World Bank (J. Pezzy, 1989) are identified almost 60 definitions for the durable development. But, the concept became the central point of the debates concerning the environment and development in year 1987, after the publication of the **World Committee Report for Environment and Development**, *Our common future* (also known as **Brundtland Report**). The definition given in this study became

the standard definition. The notion was also embraced in 1980 by the **International Union for Preservation of Nature**, but it remained, in the rough restricted to the dialogue on subjects concerning the preservation, having a small impact over the mind at governmental level.

The past development tendencies led to extremely limited levels of prosperity in less developed countries. Industrial activity is a main factor contributing to the deterioration of the environment. The problem brought into discussion is to reconcile the requests of demographic growth, the wills for continuous industrial development and the need to protect the environment. Due to this reason there must be identified new methods for the industrial development both in developed countries and also in the less developed ones, methods which will allow protecting the environment supportability capabilities. The only way is to reduce the pollution intensity generated by industrial activities.

The industrial development can be sustained only if it is provided the environment protection. Contrary, the gradual erosion of the environment will lead to the incapability of economic growth.

An aspect worthy to be emphasized is represented by the clean productions, which represent a way to durable industrial development. It is difficult to predict the future, but in exchange is possible to elaborate a scenario for performing the durable industrial development. A report issued by *World Resources Institute* stated the following: human impact over the natural environment depends fundamentally of the *interactions existent between the population, economic growth and technology.*

The implementation of clean productions needs **modifications in the mind and human attitudes toward the productive process and the environment.** It is necessary to reduce the dependence of fossil fuels, especially coal and, as indicated, to close the cycles of materials and products. These types of structural changes will occur only if and when **there will be created economic and legal stimulants**. These types of stimulants can enclose: laying taxes on resources or emissions; marketable pollution agreements; subventions; the interdiction to use certain materials.

In the last years the inclusion of the environment into the national accounting acquires new equivalences, another aspect which does not escape from the authors' analysis. In the same time are analyzed also the main environment management systems. The calculation of GDP and of national income (NNP) does not indicate the more and more non-sustainability. The inconsistency with which the national accounting treats the environment is one of concerning sources for the mentioned problem. Starting from this point, the winner of Nobel Prize for economy, Mr. Simon Kuznets, one of the men who contributed to the initial developing stages of accounting, he stated that "the society is directed by a wrong compass".

On the verge of the IIIrd millennium, the national prosperity and individual high life standard which must be performed in Informational Society – Knowledge Society are directly connected to the efficient application of technology which supposes the capitalization of the results of creative activity. There are numerous technologies and application methods of these results. The economic managements in other countries understand better the connection existing between innovation, technology, productivity and welfare and the creation of a new economy based on knowledge, a connection established without taking into consideration the cultural differences and is applied both to states industrially developed and also to developing states.

The optimization for resources assignment appeals to methods of mathematic programming, the building up such an instrument depending on the objective followed, respectively by the construction of the objective function. This can produce the maximization of profit or maximization of the quantity of a certain type of goods in the conditions of limited resources. It can also be taken into account a function for minimizing consume of natural resources in the conditions of a production program established in different limits. A series of restrictions can aim, in the author's opinion, at least for the Romanian economy, also the external trading activity, Romania being an importer of mineral resources, of energetic and non-energetic type.

The researchers and the practitioners took into consideration for a long time the problem concerning the provision of raw and energetic materials so necessary for the performance of production, reaching the conclusion that the demarche efficiency depends, mainly, on the appropriate administration of national property and by the intense capitalization of known and available reserves.

From the economic point of view, it is important that the performed activity to take into account the pluralism of property and competition, being in tight connection with the participation to the

international work division, to the more and more acerb competition, but also with the direct intervention policy of state, by economic and financial levers, pursuing the provision of the economic equilibrium and the performance of certain social-cultural programs and of social care.

In this respect, it pleas in at least three considerations: the re-establishment of economic-social equilibrium after a period of transformations and recession, the determinations of future development strategies, the transformation of economic mechanism depending on the discoveries in science and technology. For the first time in the history of material and spiritual civilizations, it is brought into discussion the problem of organization and flexible management of activity, where it prevails the prospective, creative and innovative view, as a premise for the integral, efficient and optional use of natural, human, financial, informational and time resources available to a certain moment.

There also should not be neglected the estimation of natural capital depreciation in Romania and its implications over GDP. The estimation of economic depreciation of mineral resources is the main objective of their accounting and the premise of indicators elaboration from the national accounts which include the environment. According to Hartwick rule, the economic depreciation of mineral resources can be determined by the percentage of quantity extracted with the current marginal net price. In practice, as authors are indicating, there are a series of factors which complicate this calculation.

When the world is transforming a rhythm without precedent, where the human is acting as producer and consumer, leader or manager, but also as a performer, creditor and debtor and usually, as performers of a certain initiative, and it is normal that his education, professionalism, motivation and satisfaction during his activity and his life, in general, to arouse the researchers and practitioners' interest. As a result, in the last period there had been issued and published numerous and especially valuable treatises, where are approached different aspects of the human resources management, starting form the premise that, still, the human was and remains the main production factor, the creator of all material and spiritual goods.

Taking over captiously the advanced ideas, concepts and methods, systematically harmonized to the social and economic particularities of the space and time there can be obtained superior performances in the activity performed at the micro and macro level, quantitatively and qualitatively. In this context, the organization of human resources activities can be performed on several areas: salary policy, education, work normalization, research, in functional and matrixer structure, having as **objective**: the elaboration, designing, optimum use, maintenance and humanly social development.

According to the specialists estimation, the most difficult problem for the performance of this measure during the transition period, is the own transformation in the organization and management of human resources. **The changing policy** is an ample and complex process of structural adjustment taking into account the social-economic, political, cultural, educative, legislative, traditional environment being in a continuous transformation under the stress of science and technological discoveries. We take into consideration the change of technical and instrumental means, and also the methods and managerial proceeding.

From this point of view, appears as clear as possible, in a proximate future, we will assist (or participate) to the radical modification of the new employees' motivations, requests and behaviors. Even if we admit or not, the youngster's general disbelief in traditional values of the organization and activity performance is more and more pronounced every day.

Even if you accept or not, the desire of safety, of having a rapid evolution into the hierarchy, the aspiration for being useful and for applying the ideas and knowledge acquired, a greater sincerity in the relations with other persons, is part of the behavior of the present generation of youngsters. We must not ignore, as least, the reality that, satisfying these new needs supposes the significant change of the recruiting system and selection, but also the one for integration and promotion.

A lot of developed or developing countries prepare strategies of durable development (usually called action plans or policies). Some of these have been conceived a long time ago, others had been initiated pursuant to the reports prepared for the Conference in Rio.

The scope of durable development national strategies is to integrate the considerations concerning the environment into the general plans of economic and social development and to promote a coherent and comprehensive national policy in the environmental area.

Among the **fundamental elements of a national strategy of durable development** the authors mention: the quantitative objectives (for example, the reduction of emission particles to a number of tons); the terms when these objective will be accomplished; specific actions performed by all domains (agriculture, transport, industry, constructions, trading, etc.); the financial and economic implications of the specific actions; the clarification of the ministries role and responsibilities in supervising and monitoring the specific actions.

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THE CHANGE – AN IMPERATIVE REQUEST FOR THE DURABLE OR SUSTAINABLE DEVELOPMENT

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Abstract:

A credible hypothesis suggests that, in the future the economic growth will not be anymore a general and continuous one, and that the economic agents known from the special literature under the conventional name as organization or company (a group of persons acting conscious and coordinated in order to achieve common objectives), shall survive only if they make sustaining and continuous efforts to assimilate, in due time, the "last moment" technologies, including the ones referring to the organization and management of the performed activity. In this respect the plea in favor of the performance and elaboration of ***provisions or prognosis****, as a premise of durable development, becomes legitimate and credible, contributing to the resolution of problems claimed by the general progress.*

Starting with XXIst century, the chance of survival of the economic and financial-banking units is proportional with the value of the management action, demarche known in the special literature as ***strategic management or management of change****. But in order to be a successful one, the management must be* ***creative****, of prospective type and, as much as possible,* ***non-conflictive****.*

1. Introduction

The term **chance** has the meaning of **transformation or upheaval in the form and content of an object, product, activity or process.** The probability of success to pass from the existing stage to the one you want depends on several variables, and can be expressed, as R. Beckard and R. Harris showed by the following relation:

$$C = \frac{f(A,B,D)}{X}$$

where A is the level of dissatisfactions felt; B – the clarity in the definition of the wanted status; D – the first step made toward the future stage; X – the cost of change.

The construction of prognosis is based on quantitative analysis and studies, starting from the statistical and theoretical data, adjusted and recalculated. Among the statistic parameters (estimators) determined, the most important one is the percentage square average deviation (A_m), calculated using the following formulae:

$$A_m = \sqrt{\frac{\sum_{i=0}^{n}\left(\frac{y_1 - y_1^{'}}{y_1} * 100\right)^2}{n}}$$

where y_1 and $y_1^{'}$ are the real static data for each year of the period considered as conclusive for the retrospective analysis, and n – the number of years from the statistic period.

Passing from the analytic or Cartesian view to another evidently creative one (figure 1), where the decider subjectivism is replaced by the objectivity and efficiency of informative and communication electronic means, more and more complex and performant, as computer, e-mail,

internet or web, marking a new stage in the realism of decisions and projects, constructed and adopted to a certain moment. For the first time, it was amplified both the trust in these methods, but also the degree of social and political acceptance of the risks enclosed by their performance.

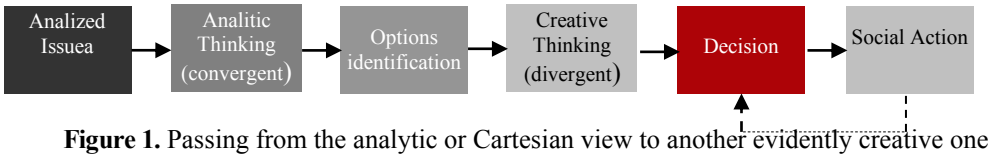

Figure 1. Passing from the analytic or Cartesian view to another evidently creative one

The technical mechanisms mentioned are, in their turn, made by humans, and as soon as they obtained the capacity to reproduce themselves, each time to higher parameters, they determined the considerable reduction of human resources involved in the performance of assets and services, concomitant with the growth of quality and efficiency.

Beyond de human will, **the economy of the future will have another configuration,** where robotism and information science will emphasize an inedited relation between the technical progress and the social-economic one. As **in the informative economy, the value is amplified by knowledge**, we can conclude that **theory of value based on work will give away its place to another one dominated by inedited performance and by prospective attitude**. The specialists in the area are unanimous in sustaining the fact that the transition from the industrial society o the **knowledge society** (or informational) carries a series of transformation in the mentality and collective action, among which the most important ones are:

- The innovations and inventions from the electronics **accelerating the rhythm of changes** in all domains of activity;
- The robotism and information of productivity of assets and services **disposes of a great part of human resources** from the traditional activities, imposing the acute problem of their reconversion and use in other segments of material and spiritual creations, as an alternative to the reduction of dissatisfactions and, implicitly, to the amplification of social stress;
- **The radical transformation of the process of professional formation**, where permanent and at distance training, **provided by the hyper-universities**, will become dominant;
- **The truth, the beauty, the good become induced realities**, facilitating the philosophic-existential questioning and, therefore, the self-training and professional mobility.

It is evident that, in our millennium, the culture and science can not progress outside the interaction with the economy, politics, philosophy and ethics, stressing the dominance of social over the particular, of the synchronism over the historicism, where cognitive constructiveness outstrips the reproduction. But, in order to provide **efficiency of social action**, it is vital that the researchers and deciders motivation to become the self motivation of the people called to perform the objectives foreseen and accepted.

A rational and logical process, which can be operational only if it is based on the depletion of quasigeneral aspirations, interests and options, prefiguring the occurrence and generalization of **society and management of knowledge** (figure 2), centered on the refinement of original intellectual demarche above the globalization or the political, economic, social and cultural competence.

Figure 2. Occurrence and generalization of society and management of knowledge

In an organizational economy – interconnected and integrated – weather **transactional** or **relational**, the activity of private or public economic agents are not anymore in conflict with the society.

On the contrary, the later is forced to implicate in the elimination of possible signs of hostility by consolidating and applying the law capable to make a more friendly business environment, internally and internationally. The persuasive role in this direction comes to the institutional department, more precisely to the appurtenance to multilateral organisms and organizations having rights and consensual obligations.

In consequence, it is expected that the classical demarche unanimously accepted: deduction – forecasting (modeling and simulation) planning – results to break down definitively in favor of **proactive demarche** having the following form **intuition → objectives → modeling and simulation → planning → reaction.**

2. "Spontaneous" change, by generalized knowledge and action.

It is considered to be the most momentous "miracle of human universe", the knowledge induces an complex training effect, theoretical and practical in the same time, allowing the best exploitation of available resources with the population fundamental and real needs, with the criteria of economic, technologic and ecologic efficiency. From the strictly semantic point of view, **the knowledge** represents the process where the observer or the researcher shapes certain images, conceptions and theories concerning the surrounding reality, but also about himself, using certain specific instruments of practical action. This is about a complex and ample demarche performed gradually, from the perception of phenomenon until its essence, giving an approximate "radiography" for the reality explored from nature or from the society.

Depending on the concordance or non-concordance with empirical facts (reality), the searched truth can be false or not, where also results the need to call to a **system of principles and methodological norms**, rigorous and concrete, being able to provide the conversion of the theoretical system, respectively the set of laws, theories and concepts found in relations of interdependence, using a methodology appropriate to the explored domain.

So, while the **theory** supposes the abstraction and isolation of the aspects studied, as internal component parts of the real phenomena (processes), **the methodology** aims to the entire demarche of knowledge, emphasizing the direction and the routes to be followed in order to reach the truth or new, relevant, knowledge. Evaluated from the perspective of general theory of systems, the method and methodology show their composition on *three distinct levels*, namely: of **maximum generality**, applicable in all domains of activity; of **border**, commune to more particular sciences (experimental method, statistic calculation etc.); **specific**, distinct from one discipline to another.

Of course that between the **scientific knowledge** and **common knowledge** there are certain differences, observable on various plans. First of all on the plan of the **form**, according to which the scientific research is characterized and occurs mainly under the form of theories that explain the phenomena analyzed, allowing their provision, and the common research opens an heterogeneous filed of applicative and practical knowledge developed spontaneously under the working process in the form of needs or necessities.

Secondly in the form of **methodology**, out of which results that the research has a methodological perspective so that it emphasizes the qualitative properties of phenomena and of the connections between them, likely to be registered, classified and measured, and that the common research does no reach to rigorous and controllable truths.

Thirdly in the form of **hypothesis checking proceedings**, from which we conclude that the scientific research owns complex criteria and tests to verify the truths, having a highly predictive capacity, and that the common research is based only on assays, as the only way to verify the hypothesizes.

Fourthly in the form of **language**, which emphasize that the scientific knowledge uses a specialized and symbolic language, with a highly abstraction degree distinct from one science to another, different from the common language of the common research.

In the end of general considerations, it is appropriate to make the mentioning that, usually, the scientific knowledge is realized on two levels having a direct connection, respectively **the empiric knowledge**, namely **the reflection of objects and phenomena (processes) studied as observations**, the observation and description of facts and data observed, organized in sensations, perceptions and representations, and also the **theoretical knowledge**, superior form of abstract mind which facilitates the discovering of truth using the analysis and synthesis, induction and deduction.

In other words, the theory must satisfy certain requirements among which *logical coherence* (theoretical statements to be mutually compatible), *deductibility* (statement to follow logically one after another), *completeness* or saturation (the statement to cover the entire domain studied, identifying the essential relations between the phenomena or processes) and to be *verifiable*, meaning that the theory to find a correspondence in practice (figure 3).

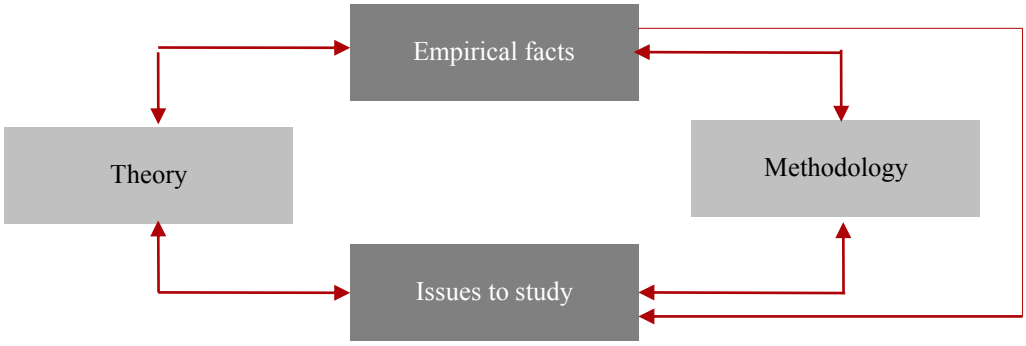

Figure 3. Requirements of the knowledge theory

In our opinion, and not only, the scientific knowledge includes the learning and systematic assimilation by modern forms beginning with school and continuing with permanent preparation, contributing to the realization and promotion of general progress (figure 4).

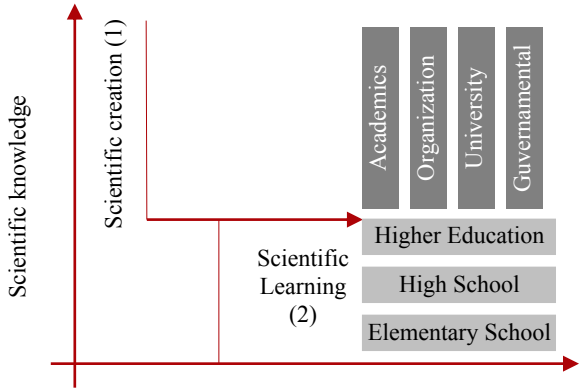

Figure 4. The realization and promotion of general progress

Even if we accepted it or not, the world has changed so much in the last decades that the present and future generations need relevant information, capable to provide the professional and social integrity without major shocks, so traumatizing. In this context significant are the conclusions of studies recently elaborated in countries with old and remarkable traditions and performances in the area, for example in England, France, Germany, Japan, S.U.A., etc., where is evidently emphasized that the teaching style – too scholastic and encyclopaedic – and the classical evaluation and examination method, as indicator of the level of knowledge, are overdue, convincingly pleading in favor of the statement that the youngsters, in general, and university graduates, in particular, must be supported to develop their imagination and practical sense.

Moreover, most of the youngsters study domains as business, law, accounting, design, environment, tourism and management, where prospective research holds an extremely important percentage. In the same time, more and more specialists in sociology reached the conclusion that, in the present, the school

has the duty to surmount the decay of spiritual and moral values which are responsible of the transition periods and family. In our country, the regeneration and progress can become effective – as analysts state – through church and school, institutions which still enjoy of a high prestige, where from the explicit conclusion that prospective research must contribute to the formation and development of human personality.

Inside a integrated and competitive Europe, ready to face the more and more acerb external competition, the chance of Romania and, generally, the chance of small and middle countries, is **in knowledge and competence based on culture and values**, on calculated **risks** taken by the political class and civil society to consolidate and project the **durable development** or sustainable, not only depending on the ecological criterion, but also on the one of equity and of social ethics, of same importance.

From what we can see, knowledge, the most important miracle of human universe [16, pag.265], changes the society from the grounds. In the sense that it becomes the most efficient economic resource in the production of assets and products requested on the market, but also a sui-generis merchandise which can be made available independently, in the form of results from the research-development (knowledge, experience, market information), of assistance and professional formation. But, in order to reach this goal, it is necessary of a **continuous learning** and of **multiple careers**, as the production and use of the new knowledge supposes permanent reconversion and observance of cultural plurality.

The researches show that the information without education can not have a significant value, reason for which the middle term national economic development strategy of Romania, a result of a larger consensus of the political spectrum, aims "the attenuation and gradual elimination of gaps between us and advanced countries, the modernization of Romania, in step with the transition exigencies to a cultural-informative economy where the educational capital is the keystone of the economic and social development".

Actually, we are not in front of an option, but of a surviving condition as a nation into a global world, which imposes the redefinition of the relations between the countries, organizations and technologies, as the transit from the quantitative approach to another qualitative new one, facilitated by the informational technology which transforms significantly the economic and social environment.

The memorandum concerning the learning on the whole life period, adopted by the European Union in 2000, mentions the organization of the adults professional forming system, as follows: *initiation* (acquire knowledge, minimum skills and customs necessary for the progress of activity explicitly defined), *qualification* (the group of professional competences capable to provide to persons the performance of activities specific to a job), *development* (development of professional competences inside the same qualification), *specialization* (acquire knowledge and skills in a restricted area from the occupational sphere) and *requalification or conversion* (obtaining competences specific to another occupation or profession, absolutely different from the ones previously acquired).

As Al. King and B. Schneider noted in the Relatively recent report of the Club in Rome, suggestively named "The first global revolution", published also in Romanian language, into an open society, subjected to transformation rhythms without precedent, the educative-formative dimension is attested by *the members open view toward change*, by their conscious and direct participation to the consolidation, adoption and performance of worldly change, based on the operational and structural interdependence between the continuous and discontinuous processes.

In the opinion of the two mentioned before, shared by more and more well-known researchers in the area, behavioral formation and professional education accompany and accelerate the development of the other society subsystems, under the pressure of science and technological discoveries.

In this respect, one's attention is also attracted by the study of the university professor ph.D, I. Avram, published in *The economist*, under the name *Contributions to the conceptualization of globalization and its implications*, according to, the modern education studies the cooperation between the teacher and student, the later becoming conscious of his role in the learning process and of self education. Besides, the ideas suggested by the two actions performed in our country last year, under the motto *Informed educational system – a chance for Romania*, go toward the conclusion that beyond the positive effects registered in the plan of content and efficiency of modern training processes, it is

also registered a significant reduction of the expenses and purchasing period concerning the documentary material and attribution of actual knowledge.

3. Directed or oriented change by strategic management.

The adaptation to concrete conditions of economic-social and physical environment, but, especially, of present and future requirements and exigencies actually suppose a sequence of changes in the plan of methodology and attitude, under the stress of strategic factors as information, knowledge and creativity specific to scientific and professional management, by excellence of prospective type (figure 5).

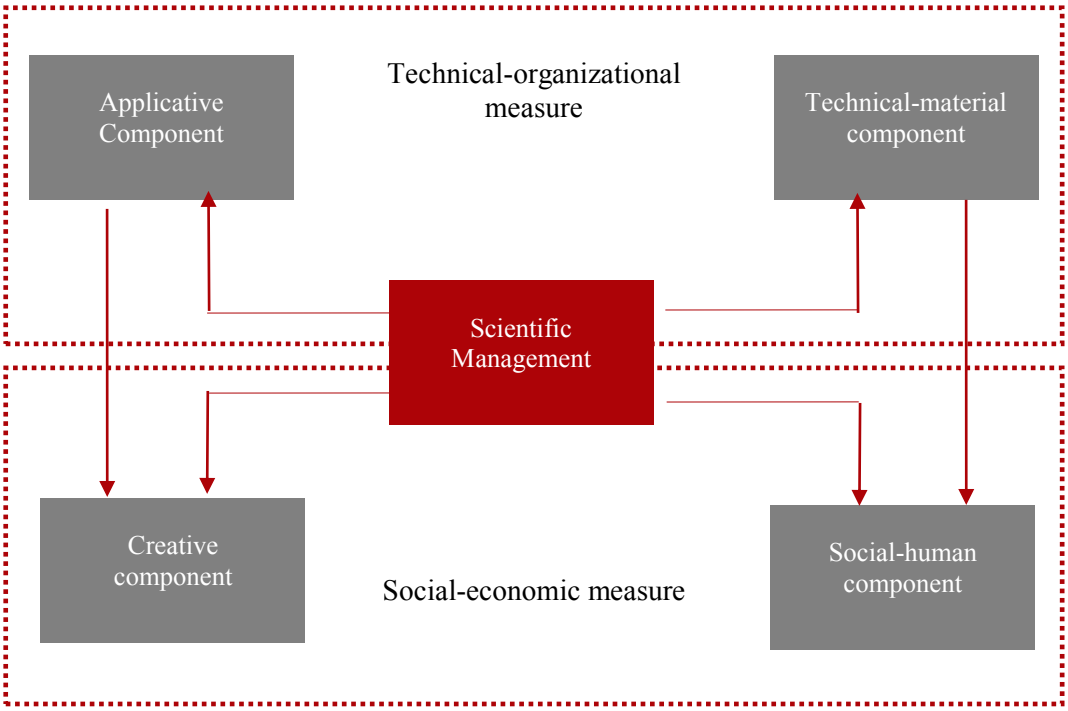

Figure 5. Scientific Management components

By means of communication these value concepts become instruments of the competition on the internal and international level, placing the economic agents and the respective country in a favorable position inside the acerb competition.

Besides, the communication is vital for each of the management functions or attributes in order to use the English term already naturalized in special literature and courses around the world:

- The provision or planning defines the scopes which are to be performed, as the resources necessary for the respective demarche, using relevant and actual information concerning the internal and international evolutions. In this respect, after the organization of assistances and debates where are taking part employees and experts, including persons outside the institutions of the analyzed domain, one passes to the consolidation and adoption of decisions concerning the development strategy;
- The organization establishes the priority in performing the scopes foreseen, in assigning and grouping the tasks on departments, in allocating and determining the organizational structure, therefore, providing the premises for building the relational, informational and motivational environment, performed by means of communication;
- Training or control consisting in directed the employees' actions from the direction of fulfilling the planned objectives by clear and precise decisions, dispositions and instructions;
- Coordination of performed activities and of available resources in order to obtain, in good terms and in time, the established objectives.

- Training and coordination depend decisively by the performance of an appropriate communication and responsibility delegation, by creating an appropriate cooperation climate and by the employees' motivation;
- The control and evaluation of the way in which are fulfilled the objectives, performing, if needed, the imposing corrections. Also for this case, the communication is the one providing the transmission of information, ideas and sentiments between different employees' structures.

Generally, the manager's activity is materialized by certain roles: interpersonal (representative and connection leader with the insurants or with persons and institutions abroad, for promoting the interests and needs of the respective human collectivity), informational (monitoring the information and opinions referring to the human collectivity he represents) and decisional aiming the resolution of disfunctionalities and applying the changing strategy. In other words, the scope of the managerial activity is to generate the informational and material resources in order to pass from results to performances, a process emphasizing a certain sequence of the mental conditions characteristic to quick and efficient changes (figure 6).

Figure 6. The sequence of the mental conditions characteristic to quick and efficient changes

To the micro level of the economic agent or of the homogenous human collectivities, the interdependence between change and development (figure 7) emphasizes the following significant aspects:

a. the development line (D curve) is determined by the rhythm of changes in time, graphically represented by the C_i mudding curves; for longer periods of time, the development curve develops exponentially;

b. the C_i mudding or changing curves characterize the environment where is acting the examined economic agent and have a asymptotic fall, because a series of elements which influence the change (traditions, customs, resources, etc.) have a long existence;

c. the change performed in t_i period enters in operation in the next period t_{i+1}, after which is followed by a maturity period, when they manifest their entire side, afterwards they gradually decrease once the aging process occurs.

In the economic plan, the change represents the replacement, modification, transformation or upheaval in the form and/ or content of the activities, products and services. In a recent paper [1], is emphasized the relation between the change and organizational development at the level of the economic agent (figure 7), between which there are informative and decisional flows and connections:

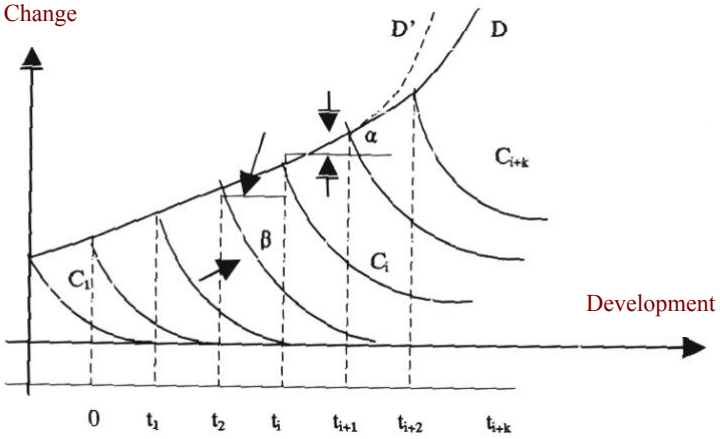

Figure 7. The interdependence between change and development

[1] Howard A.R., The Fondation of Decision Analysis, Stanford University, SUA, 1968.

- Development curve (D) is determined by the rhythm of changes in time (Ci), for longer periods of time, and develops exponentially;
- The mudding or changing curves (Ci) characterize the environment where is acting the economic agent, having a decreasing asymptotic evolution, as certain elements which influence the change, as traditions, customs, resources, etc., are maintained for a longer period of time;
- The change which takes place in ti time period becomes operational into the next moment ti+1, after which is taking place a favorable maturity period and, then, another one of aging reducing the economic potential and the competitive capacity.

When changes are frequent, the renewals become profound, materialized in a bigger angle (α), while the products, technologies, methods and techniques life time is reducing. The development angle is determined with the following formulae:

$$\alpha = d\int(\beta)$$

where β is the rhythm of renewals, while d – the correlation factor which differ from one country to another, one domain to another depending on their level of technological development. Among the factors which support a high level of chance we can mention: acceleration of creative process, individual and collective; practicing a flexible, dynamic and efficient management, materialized into the decisional, informational and organizational subsystems; susceptibility to new of all managerial structures.

Shortly, once the products life time is reduced, the economic agents have to become more flexible, meaning to shorten the cycle of their technologic production and the designing period. Of course, that there is also a certain resistance to change which decision factors must take into consideration. An explicit or open form of resistance is manifested by strikes, reduction of works productivity, inadvertence in operation and even sabotages. Another one, implicit or hidden, is expressed by raise of absenteeism and delays, resignations and loss of motivation in work, equaling with moral dropping. There is also the individuals' resistance (figure 8) and the resistance of economic agent or organization to change (figure 9).

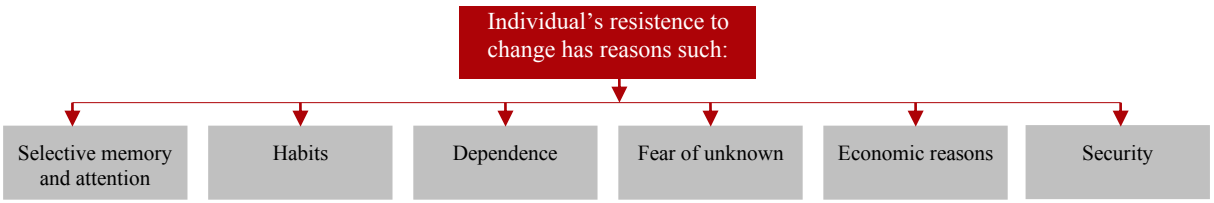

Figure 8. Individuals' resistance to change

Analyzing the "field of forces", K. Lewin considers the change not as a common event, but as a dynamic equilibrium acting in opposite way.

Figure 9. The resistance of economic agent or organization to change

- The model for planning the changes or K. Lewin model based on the change of forces maintaining the system to a stable behavior; despite the fact that is disposes of resources (natural, various and human with a reasonable level of professional qualification) considered as a good support

for the optimum development, Romania registered, not so drastically, a "deficit of performance" with negative effects over the life and work quality, over the population state of mind. There occurs inevitably the request of strict and correct evolution of the fifth production factors – human resources, work, time, capital and information, where the state is the warrantor of keeping the economic and social order.

- The model of research action which considers the changes planning as a cyclic process, where the initial research action of an activity provides information which will stand at the basis of the future research action;
- The model of contemporary adaptations to the research action, characterized by increasing the number of participants to the changing processes and by promoting the positive concepts and methods specific to changes;
- The model of systemic approach, according to which there are five variables inducing the change, being in inter-conditioning relations (fig.ure 10): employees, tasks to be fulfilled, used technology, structure of the activity performed and pursued strategy.

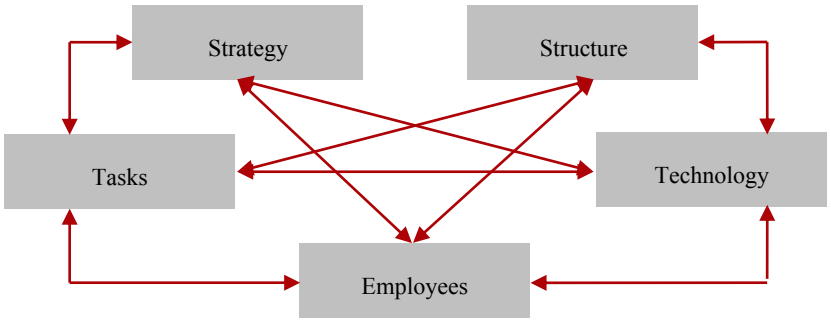

Figure 10. The five variables inducing the change: employees, tasks to be fulfilled, used technology, structure of the activity performed and pursued strategy

As resulting from the drawing, the alteration of a variable carries changes at the level of another one or for all the other ones. For example, the modification of strategy determines changes of organizational structure which, in their turn, impose o reconsideration for the task to be fulfilled; the alterations mentioned can also determine changes at the level of technology, affecting the behavior and even the human resources structure (employees' structure).

Except the first three models described, which present explicitly the stages of planning and realization of changes inside the economic agent examined, the model of systematic approach does not have such provisions, emphasizing the importance which must be granted to the interdependences between the five variables. From the comparative analysis of the fourth models, we note that the transition from a certain (real) situation to the desired one has a series of particularities, but also common features, leaving the possibility to conceive a general model for planning and realizing the organizational changes. As R. Beckhard stated, the probability of success for any change depends on several variable (figure 11):

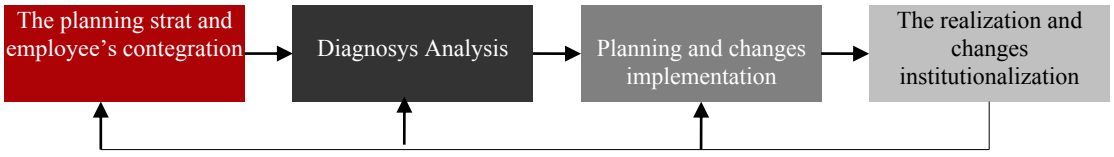

Figure 11. Variables on which depend the probability of success for any change

$$P = \frac{f(A, B, D)}{C},$$

where P is the probability of success of the change; A – the level of dissatisfactions inside the organization; B – clarity of the definition for the desired or future situation; D – first step toward the future stage and C – the cost of change.

Usually, the specialists involved in improving the performances or in planning the change come from outside the organization and only a small part inside it, respectively the ones who perform the diagnosis of activity or supervise the performance of the proposed solutions. A rational working hypothesis which claims the systemic approach in the dynamic perspective of any problem, in order to make the differentiation between the values of objective j in the moment t_p corresponds to its consolidation and establishment, expressed by means of the following formulae:

$yt_p = f(t_p)$

and its value in the forecasted t_v moment of the prevision horizon (performing the respective object).

$yt_v = f(t_v)$

4. Change under the "pressure" of public opinion, by means of revolt started spontaneously or premeditated (organized systematically, parallel with the political exercise in operation).

Between the social problem and the economical one, between this one and the political one there is a biunique connection, thus the changes occurred in the evolution of one of the components is inevitably manifested over the status of the other two components. The demarche is more complex in case there take place any changes in the structure of society, concomitantly with the ones referring to attitude, mentality of human communities, as the attitudes integrate three components and namely: cognitive referring to knowledge and convictions, emotional or affective and behavioral, which imply the delimitation of persons, objects and situations. Hence, the extremely important role of communication as a mean to transmit the ideas, feelings, convictions and knowledge, in the building, adoption and realization process of the decisions pursuing the edification of the desired society. In consequence, by content and form, the communication must be subordinated to the performance of the afore established objectives, observing certain specific ethical norms, not fund in the culture and organizational structure, or in the managers individual ethics. As one can foresee, the manager does not communicate randomly, as he wishes, but accordingly to some requirements and strategies capable to provide the change where the manager or the leader of opinion fulfills a plurality of values: of representation and negotiator, as moderator and disseminator of information, of resource assignation.

5. The particularities of changes in our country.

The careful analysis of the evolutions in Romania during the 14 years of transition reveals a few fundamental conclusions referring to the subject expressed, especially the decisional crisis at the macro social level and the managerial crisis at micro social level, of economic agents and of financial-banking institutions, generated of the hesitation and inconsistencies in performing the transformations compatible with the progress and general competition, with the entities structures toward we tend to.

Unfortunately, being too long under the tyranny of the chaos of the transition to the democratic rule of the law state and to the exchange economy, Romania passes through an extremely difficult period, dramatic under the ration of the standard of living. Actually, starting with the century which has just begun, the change becomes, in the modern society, a continuous process affecting both the political, social, economical, cultural and educational structure, but also the attitude and humans mentality. Such a postulate acquires a consistence and significance during the period of transitions, from the ideological ones to the reorganizational ones, as the case of our country, being under the incidence of certain imminent major objectives of power and political class, of civil and academic society, of population, in general.

A. Stopping the decline of the gross domestic product (GDP) and immediate start of the real economic growth. The analysis of the GDP and investments dynamics, of exports reported to imports can lead to edificatory conclusions. Contrary to the fact that it has resources considered as a good support for the social and economic development, unfortunately, Romania registers, for a long time, a "deficit of performance". To the constrains of worldly economic growth generated by the amplification of pressures over the natural world, of which we are still depending on, there are also

added severe errors in building and establishing the strategy (clear image over what must be performed in a certain time period, implying the organization of resources in order to achieve certain afore established objectives) in aiming to overcome the transition period, facts which let to the liquidation of over five million jobs and to the considerable reduction of productive units economic substance concerning the goods and services, and implicitly their competitive capacity. As far as we know, the disbanded units had been "realized" by selling the recoverable materials, meaning scarp iron.

B. Investments stimulation, namely in production factors – the motor of durable development. The estimation of investments at the level of a decade (table 1), emphasize **the existence of a periodicity**, respectively in the development period takes place an explosion of investments and during the recession period a drastic restriction of expenses in the area.

Table 1. The estimation of investments at the level of a decade

Years / Sector	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
	100	100	100	100	100	100	100	100	100	100
Services	34,08	30,8	40,6	39,0	42,5	38,6	40,6	40,9	42,1	42,2
Constructions	2,0	2,5	2,8	5,4	5,2	6,3	8,3	7,0	6,9	6,7
Industry	54,5	56,5	50,0	36,9	41,6	43,9	44,8	45,6	44,3	44,5
Agriculture	9,55	10,2	6,6	18,7	10,7	11,2	6,3	6,5	6,7	6,6

Source: Data taken out of the Statistical Annual of Romania 1990-2000 and from the Romanian Centre of Foreign Trade (Internet).

The analytical measure indicates significant changes and flagrant disproportions having an impact over the social-economic evolutions, and not only, among which have we mentioned:

b_1 – Radical modification of the investments directions in the main domains of activity – the constant development of investment efforts in the services area (from 34% in 1991 to 42,2% in 2000), concomitantly with the reductions for the ones in industry (from 54,5% to 44,5%) and in agriculture (9,55% to 6,6%) – concordantly with the international tendencies and with modern economy exigencies where services contribute to GDP with over 50%. It still has to noted that the restriction of the investment effort in agriculture affected to a certain degree the safety of food in our country and the equilibrium of the balance of foreign trade;

b_2 – The emphatic evolution and modernization of activities technical-material basis in area like: financial-banking institutions, insurances, post, telecommunication, although in some cases the efficiency and utility criteria had been ignored, by building up luxurious offices, but less operational;

b_3 – The extension of investment process in trading and tourism was accompanied by the reduction of the activity performed, diminishing severely the economic efficiency;

b_4 – The constant reduction of investments in agriculture and industry generated an accentuated deterioration process of the technical-material basis and, implicitly, of the competitive capacity on the internal and international market.

Of course, the restriction of investments at the level of national economy, in comparison with the previous period, represented one of the main causes of the economic collapse, perpetuated along the decade, having negative effects over the level of GDP and of human resources occupation, of the Romanian economy competitiveness, in general. In the analysts opinion, the prolongation of the inflation for the whole period and the adverse monetary policy promoted reduced substantially the economic agents possibility to invest, fact which reflects the lack of coherent strategies aiming privatization, transformation and modernization of national economy, the noninvolvement of political power, in the limits of the legal attributions for stimulating the investments by using the arms and instruments used by the prosperous states: credits, interest rate, tolls, taxes, building the infrastructure, etc.

The first one and the hardest phenomenon occurred after the appliance of measures aiming the change of economic system was the alarming drop of production, and the resulting effect determined unwanted effects in all domains of the economic and social life. In this context, our country foreign

trade took over this sock manifested mainly in its drastic reduction, but on the difference between the two components – export and import. Also, the geographical orientation of our foreign relation had been significantly changed and, first of all, the foreign trade. The transition to the new economic system also meant new regulations in the domain of economic policy, their direct effects being induced in interactional areas or which have an impact over the foreign trade, and which most of the time had negative consequences.

C. Speeding raise of exports in comparison with imports – method of preventing the endogenous or exogenous stresses. During the period of the 10 years which had been examined, the Romanian export registered a speeding regress, followed by a slow growth (see table 2).

Table 2. Romanian Foreign Trade volume during 1991 – 2000

Years / Volume	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Foreign Trade										
- mild. lei	771,8	3250,90	8471,90	21275,30	34757,60	57895,30	136127,60	171241,20	283046,40	-
- mil USD	9648	10147	10912	12713	17397	18603	18842	19228	18231	22417
Export										
- mild. lei	341,6	1397,90	3775,90	10272,80	16214,00	24961,90	60681,50	73702,60	131664,20	-
- mil USD	4266	4363	4892	6151	7910	8084	8431	8302	8487	10367
Import										
- mild. lei	30,2	853	696	1002,50	9543,60	2933,40	5446,10	7538,60	51382,20	-
mil USD	5372	5784	6020	6562	9487	10555	10411	10926	9744	12050

Source: data taken out of the Statistical Annual of Romania 1990-2000 and from the Romanian Centre of Foreign Trade (Internet)

6. Conclusions

From the data analysis we note the following important conclusions: the value of foreign given in lei to the current market price grows momentously, while the same index given in dollars drops in the first two years reaching almost the half of the value registered in 1989, then it starts to raise, reaching the respective level almost in 1998; the reduction of export is quicker than that of the import, given in USD (for example, the export reached 40,7% in 1992, while the import was 63,7%); the export reached the level from 1989 hardly in 2001, while the import exceeded this threshold since 1995. This situation was caused by internal and external factors among which the most important are:

c_1 – **Production collapse of goods and services** in the first two years of the examined period, together with an extremely slow rhythm of the process of economic growth followed by another accentuated drop;

c_2 **– The sudden deregulation of foreign trade** by liquidating the state monopoly and the occurrence of certain economic agents which perform import-export activities without a theoretical preparation and, especially, a practice in the area;

c_3 **–The customs tariff adopted could not become the main instrument for the trading policy**, capable to simulate the exports and to direct the imports in order to raise and develop the economy and then the population consume;

c_4 **– The measures for the economic-financial policy had been elaborated without an appropriate strategy,** coherent and articulated providing to assure the growth of real economy;

c_5 **– The disappearance of company with tradition in the Romanian economy** by decentralization and the setting out of new ones, causing the loss of business partners on the external market;

c_6 **– The disorganization of CAER market** reduced drastically the volume of the foreign trade, including the turnover of Romanian goods, among others also because of the lack of bilateral or areal agreements;

c_7 **– The loss of certain partners pursuant to the dismemberment of the Soviet Union**, both for imports and especially for exports; gradual disappearance of foreign trade based on clearing in rubles affected severely its structure especially in the relation with Russia, from a ratio of 0,94 for export/ import in 1991, we reached at 0,07 in 1999 and 0,08 in 2000;

c_8 – The wars in Romanian business partner countries, which caused the reduction and even the total cease of trading relations, as also to the difficult performance of trading actions in the respective areas;

c_9 – The conclusion of agreements with UE, AES and CEFTA determined the invasion of foreign products on our internal market, and the advantages received for the Romanian exporters could not be materialized due to the severe reduction of internal production, especially the industrial one;

c_{10} – The external financial assistance granted to Romania, as credits or investments, by the developed countries or by international financial organisms, was not significant in comparison with the one grated to other countries;

c_{11} – The extended recession from the world economy, and also the financial crisis burst during this period, in various parts of the world, affected severely the evolution of Romanian foreign trade.

Given the importance of foreign trade in the economic development of a country, it was calculated the percentage of import and export from the Gross Domestic Product (table 3).

Table 3. The percentage of import and export from the Gross Domestic Product

Years / Percentages %	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
PIB percentages in:										
- export	15,5	23,2	18,8	20,6	22,5	22,9	24,0	19,9	24,4	29,3
- import	19,5	30,7	23,4	22,1	27,1	30,2	29,8	26,3	27,1	33,5

Source: data taken out of the Statistical Annual of Romania 1990-2000 and from the Romanian Centre of Foreign Trade (Internet).

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USE OF AN INFORMATIONAL SYSTEM FOR MODELING AND SIMULATION CONCERNING THE PROGNOSIS OF ELECTRIC POWER

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Abstract:

The management of the electric power process in modern hydroelectric power plants implicate the intense use of the information technology, both for the activities performed in actual time and also for the ones performed outside the actual time.

Now, when discussing about the problem concerning the development of hydroelectric potential, in the same time with the optimization of production process, it is necessary to assist the manufacturer's decision in choosing those production capacities able to cover the electric power consume which has important variations in time.

Concerning the production of electric power, its defining particularity that it can not be deposited, also imposes that the prognosis of electric power to be as precise as possible. Using an advanced informational system instrument for parametric modeling and simulation concerning the electric power can also be made scenarios and prognosis having an error of 3% instead of 5%, in the present, being place at the upper limit of the admissible safety concerning the operation of the national energetic system.

Key words: production optimization, parametric modeling, production prognosis, web application

1. Introduction

Variation in time of the electric power consume outlines a series of technical problems concerning especially the coverage of the variable part from the load curve.

The main technical requirements which must observed by the plants participating to cover this area are:

- *High loading speed,* in MW/min, in order to provide the slope for rapid development during the peak hours;
- *Actuation in a very short time,* in order to participate at the coverage of the variable part from the load curve;
- *Possibility to take over the sudden load variations;*
- *Full load when operating with alternating load;*
- *The possibility to operate at the minimum load as low as possible;*
- *Safety in operation at alternating loads and during the transitional processes connected to the groups starting.*

2. Application

The technical requests to be observed by a group for operation in alternating regime are concentrated in the handiness concept.

The hydroelectric power plants observe all these technical requirements, fact that makes them more appropriate in covering the variable part of the load curve.

The establishment of the curve to be covered by the hydro units (hourly values) is illustrated in fig.1

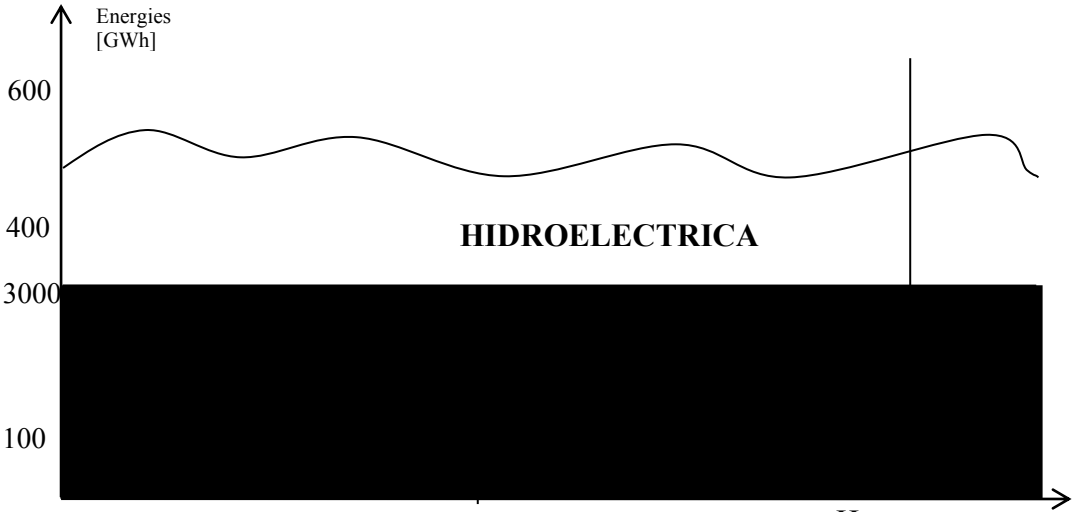


Figure 1, Load curve

Considering:

Ci, i=1…24 as the hourly values from the prognosis of the internal consume made available by the OPCOM,

Mc – daily average of the values above,

Mh – daily average of all contractual obligations of S.C. Hidroelectrica S.A.

Ei, i=1…24 – hourly values of export obligations with the Mc average.

We obtain:

Mrest=Mc + Mc-Mh – the average remained to be produced by the rest of producers and which is considered equal with the hourly values, taking into account the fact that is about the nuclear and thermal plants which usually produce, banded energy (the darken area in fig. 1)

It results:

Hi=Ci+Ei-Mrest – these are the hourly values to be covered by the hydroelectric production (the white area in fig. 1).

The prognosis of annual production is an operation of great importance for planning the operation of the energetic system in the conditions of the Romanian market energy. Deviations higher than 5% in the evaluation of hydroelectric resources can have as consequence difficulties in providing the quantities of energy and the volume of system services, and also the disorder of market economic mechanism.

Lately, the importance of short time prognosis activity is determined by the amplitude of changes generated by the transformations in this sector and by the organization of the energy stock market.

Through its hourly performances, the production of electric power at national level is classified, from the statistic point of view, in the series of time category. The special literature generally presents two approaching methods:

- **parametric models** preferred for efficiency and for the fact that they can be developed both on the basis of a wide and small data register;
- **non-linear models** based on neuronal networks. This method is more advantageous because it allows the use of incomplete data sets, missing their continuity and it can use, just as parametric modeling, simultaneously information coming from multiple domains (energetic, meteorological, economic), but it needs a mighty modeling, prognosis and maintenance effort.

Using the method of neuronal networks does not guarantees the obtaining of any results better than the parametric models and that is why we have chosen an approach based on the parametric modeling.

Now, inside Hidroelectrica, the production planning is based on the establishment of "hydrological features" of hydrographic basins for the next period, taking into considerations the evolution of hydrological characteristic in the previous year, a method which does not provide sufficiently good accuracy.

The method we propose, for the prognosis of Hidroelectrica power production, is the static method for performing the short time prognosis based on a static model.

The wide spread static model has the following form:

$$P(t) = \sum a_i(t) \bullet f_i(t) \div \varepsilon(t), \qquad t \in \tau \tag{1}$$

where:

P(t) is the electric charge at t moment;

$f_i(t)$ – time function, usually sinusoidal having a 6 or 24 hours period, depending on the forecasted time interval;

$a_i(t)$ – coefficients of loss, in general variable in their turn, but constant for particular situations;

$\varepsilon(t)$ – modeling error.

The advantage of this method results from the fact that they are simple, the model parameters can be easily updated using a linear regression or an exponential adjustment. The disadvantage concerning this method consists in the inflexibility offered by the same period to functions $f_i(t)$, the fact that they can take into consideration the changes in the electric power consume and the coverage of load peaks.

A model improved variant (l) is the one where the functions $f_i(t)$ correspond to the spectral decomposition of time series in the frequency domain. In these conditions a time variable is given by the following equation:

$$f(x) = a * \sin bx + c * \cos bx$$

Using the method of the smallest squares to determine the values occurring in the expression of the function taken into consideration, there must be solved the following system:

$$\sum \left(a * \sin bt_i + c * \cos bt_i - Y_i\right)^2$$

$$\sum 2 \sin bt_i \left(a * \sin bt_i + c * \cos bt_i - Y_i\right) = 0$$

$$\sum 2 \cos bt_i \left(a * \sin bt_i + c * \cos bt_i - Y_i\right) = 0$$

Equivalent with:

$$a \sum \sin^2 bt_i + c \sum \sin bt_i \cos bt_i - \sum Y_i \sin bt_i = 0$$

$$a \sum \sin bt_i \cos bt_i + c \sum \cos^2 bt_i - \sum Y_i \cos bt_i = 0$$

$$a^2 \sum t_i \sin bt_i \cos bt_i - a * c \sum t_i \cos 2bt_i - c^2 \sum t_i \sin bt_i \cos bt_i - a \sum t_i Y_i \cos bt_i + c \sum t_i Y_i \sin bt_i = 0$$

```
m1:=a*(sin(b*1)^2+sin(b*7)^2)+c*(sin(b)*cos(b)+sin(b*7)*cos(b*7)
)-(1466*sin(b)+892*sin(b*7))=0;
 m2:=c*(cos(b*1)^2+cos(b*7)^2)+a*(sin(b)*cos(b)+sin(b*7)*cos(b*7
))-(1466*cos(b)+892*cos(b*7))=0;
m3:=-a*c*(cos(2*b*1)+7*cos(2*b*7))+(a^2-
c^2)*(sin(b)*cos(b)+7*sin(b*7)*cos(b*7))-
a*(1466*cos(b)+892*7*cos(b*7))+c*(1466*sin(b)+892*7*sin(b*7))=0;
```

We solve this system using the computer and we obtain several solutions:

$$m1 := a\,(\sin(b)^2 + \sin(7\,b)^2) + c\,(\sin(b)\cos(b) + \sin(7\,b)\cos(7\,b)) - 1466\sin(b) - 892\sin(7\,b) = 0$$

$$m2 := c\,(\cos(b)^2 + \cos(7\,b)^2) + a\,(\sin(b)\cos(b) + \sin(7\,b)\cos(7\,b)) - 1466\cos(b) - 892\cos(7\,b) = 0$$

$$m3 := -a\,c\,(\cos(2\,b) + 7\cos(14\,b)) + (a^2 - c^2)\,(\sin(b)\cos(b) + 7\sin(7\,b)\cos(7\,b)) - a\,(1466\cos(b) + 6244\cos(7\,b)) + c\,(1466\sin(b) + 6244\sin(7\,b)) = 0$$

```
s:={m1,m2,m3};
```

$$s := \{a\,(\sin(b)^2 + \sin(7\,b)^2) + c\,(\sin(b)\cos(b) + \sin(7\,b)\cos(7\,b)) - 1466\sin(b) - 892\sin(7\,b) = 0,\ c\,(\cos(b)^2 + \cos(7\,b)^2) + a\,(\sin(b)\cos(b) + \sin(7\,b)\cos(7\,b)) - 1466\cos(b) - 892\cos(7\,b) = 0,\ -a\,c\,(\cos(2\,b) + 7\cos(14\,b)) + (a^2 - c^2)\,(\sin(b)\cos(b) + 7\sin(7\,b)\cos(7\,b)) - a\,(1466\cos(b) + 6244\cos(7\,b)) + c\,(1466\sin(b) + 6244\sin(7\,b)) = 0\}$$

```
sol:=solve(s,{a,b,c});
```

```
> eq := x^2+1285*x-112791=0;
```

$$eq := x^2 + 1285\,x - 112791 = 0$$

```
> solve(eq,x);
```

$$-\frac{1285}{2} + \frac{1}{2}\sqrt{2102389},\ -\frac{1285}{2} - \frac{1}{2}\sqrt{2102389}$$

```
> sols := [solve(eq,x)];
```

$$sols := \left[-\frac{1285}{2} + \frac{1}{2}\sqrt{2102389},\ -\frac{1285}{2} - \frac{1}{2}\sqrt{2102389}\right]$$

```
> a=(1/2)*(-1285/2+1/2*2102389^(1/2));
```

$$a = -\frac{1285}{4} + \frac{1}{4}\sqrt{2102389}$$

```
> eq := x^2-7751925-5577*(-1285/2+1/2*2102389^(1/2))=0;
```

$$eq := x^2 - \frac{8337405}{2} - \frac{5577}{2}\sqrt{2102389} = 0$$

```
> solve(eq,x);
```

$$\frac{1859}{2}\sqrt{3} + \frac{1}{2}\sqrt{6307167},\ -\frac{1859}{2}\sqrt{3} - \frac{1}{2}\sqrt{6307167}$$

```
> sols := [solve(eq,x)];
```

$$sols := \left[\frac{1859}{2}\sqrt{3} + \frac{1}{2}\sqrt{6307167},\ -\frac{1859}{2}\sqrt{3} - \frac{1}{2}\sqrt{6307167}\right]$$

```
> c=(3/20)*(1859/2*3^(1/2)+1/2*6307167^(1/2));
```

$$c = \frac{5577}{40}\sqrt{3} + \frac{3}{40}\sqrt{6307167}$$

```
> b=arctg((1/338773)*(-1285/4+1/4*2102389^(1/2)-
1/1179)*(1859/2*3^(1/2)+1/2*6307167^(1/2))+3.14);
```

>

$$b = \text{arctg}\left(\frac{1}{338773}\left(-\frac{1515019}{4716}+\frac{1}{4}\sqrt{2102389}\right)\left(\frac{1859}{2}\sqrt{3}+\frac{1}{2}\sqrt{6307167}\right)+3.14\right)$$

```
> evalf(-1285/4+1/4*2102389^(1/2));
```

41.2404310

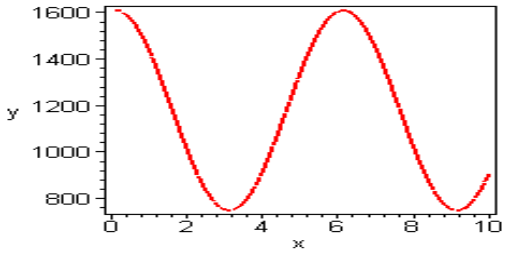
```
> evalf(5577/40*3^(1/2)+3/40*6307167^(1/2));
```

429.8467370

```
> evalf(arctg(1/338773*(-1515019/4716+1/4*2102389^(1/2))*(1859/2*3^(1/2)+1/2*6307167^(1/2))+pi));
```

$$\text{arctg}\left(\frac{1}{338773}\left(-\frac{1515019}{4716}+\frac{1}{4}\sqrt{2102389}\right)\left(\frac{1859}{2}\sqrt{3}+\frac{1}{2}\sqrt{6307167}\right)+\pi\right)$$

Using one of these solutions, we obtain the equation curve (a, b, c), having the below graphic representation:




```
> > evalf((-1285/4+1/4*2102389^(1/2))*sin(1.04*x)+(5577/4*3^(1/2)+1/2*6307167^(1/2))*cos(1.04*x)+1179);
```

$$41.2404310\sin(1.04x)+3670.615526\cos(1.04x)+1179.$$

According to these values, there will be obtained the following prognosis:

```
> evalf(41.24*sin(1.04*7)+429.84*cos(1.04*7)+1179);
```

1447.025594

```
> evalf(41.24*sin(1.04*10)+429.84*cos(1.04*10)+1179);
```

1449.587608

```
> evalf(41.24*sin(1.04*12)+429.84*cos(1.04*12)+1179);
```

1503.000879

```
> evalf(41.24*sin(1.04*14)+429.84*cos(1.04*14)+1179);
```

1404.54355

```
> evalf(41.24*sin(1.04*15)+429.84*cos(1.04*15)+1179);
```

```
> evalf(41.24*sin(1.04*20)+429.84*cos(1.04*20)+1179);
```

1058.007680

The percentage relative error (%) is calculated using the formulae:

$$\varepsilon = \frac{1}{N}\sum\left|y(t)-y_1(t)\right| * {}^{100}\!/_{y(t)}$$

where: y(t) is the value of production performed;; $y_1(t)$ is the value of estimated production.

As a test base have been chosen the hourly performances in February which does not contain red letter days, days which disturb both the analysis and the prognosis for the other days.

Based on the results presented, one can say that, from the quantitative point of view, to choose the scenario to predict the production of electric power is of a great importance. The results of the prognosis are very sensible in proportion to this criterion, especially in cases when is possible to occur a development contrary to the considered estimation. On the other hand, from the qualitative point of view, it is appreciated that the estimation based on the proposed model is a realistic approach, which provides the correct determination of hydroelectric power plants main parameters, so that they can cover the consume of electric power which have important alternations along time.

The elaboration of scenarios and prognosis is done using an advanced informational system for modeling and simulation, which also encloses a complex interconnected data base and a system of programs to provide the management of these data and their internet access system.

There had been used the newest platforms and software products for developing the data base accessible through the internet (SQL Server, OLAP).

The architecture of this application is modular, being possible to be extended with new functions, without disturbing the existent components and without the need to reorganize the existing data in the system.

3. Conclusions:

The web application based on data base, with advanced searching, displaying, calculation and presentation functions is an advanced modeling and simulation instrument referring to prognosis of electric power from all hydroelectric power plants belonging to Hidroelectrica company and to assist the producer decision in choosing those production capacities to cover those alternative part from the load curve.

Using an advanced informational system instrument of parametric modeling and simulation concerning the electric power prognosis there can also be made scenarios and prognosis with an error of 3% instead of 5% estimated in present time, located at the upper limit of admissible safety concerning the operation of national energetic system.

These application performances take into consideration the user-friendly interface, safety during exploitation and operation, data safety, short time response provided by Microsoft SQL Server 2000. The data safety shall be performed both by mechanisms specific to internet access control (proxy server) and by SGBD internal mechanisms related to Microsoft SQL Server 2000.

Taking into consideration the big territorial spread of plants belonging to Hidroelectrica, the application can also function locally, where there are no internet connections.

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COMPANY EVALUATION USING THE DISCOUNTED NET CASH FLOW METHOD

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Abstract:
This paper treats one of the most important methods of evaluation of company, namely discounted cash flow method. So, after short theoretical considerations about this method we presented a practical study of valuation for a leasing firm.

Key words*: discounted cash flow method; company evaluation*

1. Introduction

This method is appreciated as being the most modern and complex one. In the Anglo-Saxon formulation, this method is known as **discounted cash-flow (DCF)**, and in the French formulation is used the expression **discounting method of future cash flow**.

Concerning the **cash-flow**, there are several definitions of this notion, depending on the coverage sphere. In special papers there are met expressions like: cash flow, financial flow, flow of net liquid assets, treasury flow, liquidities flow etc.

As in the economic theory, by the term "cash" it is understood only the "actual currency", namely the bank notes and divisional currency, we consider that this expression is not quite correct, as in the structure of money supply besides the actual currency there is also the money of account (deposits in current accounts), time deposits and other assets with a higher or smaller rank of liquidity. Consequently, the terms of liquidities flow and treasury flow seem to be the most appropriate ones.

2. Theoretical and methodological background

The theoretical, methodological base and of mathematic calculation of company values using this method, is, basically, the theory and practice for the determination of investment economic efficiency, and, particularly, the economic-financial calculations afferent to the estimation of feasibility for a investment project.

Virtually, it is taken into account the forecasting of cash flows during the exploitation and at the end of exploitation (determination of terminal value).

Actually, the company evaluation using the discounted cash flow method comes back to the direct application of the discounted value method (VAN) to select the investments projects. The method is used both by the buyer, and by the company seller having a positive VAN, in order to establish the price offer. So, the buyer uses to determine the maximal purchase price he is ready to pay and, analogously, the seller can use it to determine the company value to the minimal price he is willing to accept.

An important role, in VAN criterion, **is played by the cash flow forecasting period**.

From the evaluation point of view, the company life can be divided in *two distinct periods:*

■ **Explicitly forecasting period**, where the cash flow can be calculated with credibility for each year. The number of years for this period is established by the evaluator, taking into account: the life period remained for the basic plant assets; the products cycle for their economic life; credibility of forecasting; period of time when the business (production) becomes stable, respectively as an annual rate for the growth of production volume, net profits attractive for the investor and rising etc.

Generally, for industrial companies, with a normal technical endowment and a rising field, the cash flow prediction is done for a period of **5-10 years**. It is accepted that, after this period, the credibility of forecasting become smaller and smaller due to higher incertitudes, according as rising

the time horizon for predictions. Usually, a 10 years time period is chosen when the company has a long exploitation history, while for younger companies, the optimum time period is considered to be 5 years. For the situation present now in our country, we consider that a horizon of financial prediction for 5 tears is the most appropriate for making pertinent estimations for cash flows.

■ **non-explicit forecasting period**, when cash flow can not be credible calculated for each year. As a global expression of whole cash flow, realizable in this period (of which duration is included between the end of the explicitly forecasting period and the infinite), it is calculated the *company residual value (terminal or continuous) (Vrez)*.

The determination as correct as possible of the size of the **residual value (terminal or continuous – continuing value)** has a great importance in the evaluation assembly using the DCF method.

The residual value represents the company value after the explicit forecasting period.

For calculating this value there are used *two methods:*

■ ***accounting proceeding,*** according to which the residual value is equal with the net asset at the end of the period reduced with the costs of liquidation, namely the net liquidating value. Therefore, this **liquidation method** supposes that the most conservative calculation method for the residual value is based on the idea that the company will be liquidated at the end of the forecasting horizon.

Also, another calculation method for the residual value is by correcting the net profit in the last year with a **residual multiplier (Z)**.

Frequently, the residual value is determined by correcting the cash flow in the last year of prognosis using the residual multiplier.

The residual multiplier depends on the sector of activity the company is part of. For developed countries, this is **between 3 and 6**. Another method to determine the Z is the **Gordon model**, namely:

$$Z = \frac{1}{CMPC - g}$$

where:

CMPC – balanced average cost of capital; g – constant rate for the annual growth of cash flow for long time period; if the predictions are made on current prices, g must be mentioned in current prices, and if the predictions are made in constant prices, also g must be mentioned in the same type of prices (so, deflated).

Therefore the calculation formula for the residual value, in this case, is the following:

$$Vrez = Z \cdot CF_n$$

■ ***financial proceeding,*** according to which the company residual value equals the amount of discounted cash flows which the company will be capable to educe beyond the prognosis period. Concretely, this supposes an extrapolation of cash flow in the last designing year.

In this proceeding we meet the following methods:

- perpetuities method;
- PER method.

Perpetuities method supposes that the company future cash flows shall be continuous. This method encloses two sub-methods:

- method of constant perpetuities;
- method of rising perpetuities.

Method of constant perpetuities supposes that the company will generate cash flows continuously. The calculation formula is:

$$Vrez = \frac{CF_n}{K}$$

where:

k – discounting rate.

Method of rising perpetuities supposes a continuous rise of companies cash flows with s g rate. The calculation formula is:

$$Vrez = \frac{CF_n(1+g)}{K-g}$$

where:

k = rate of own capital cost.

PER method supposes that the best way to determine the residual value is to use the market price to establish a relevant PER. The calculation formula is:

$$Vrez = PN_n \cdot PER_{comparativ}$$

where:

PN_n = net profit in year n;

$PER_{comparativ}$ = a company PER similarly quoted or a average PER per economy.

Referring to the residual value, we can notice the following *rules*:

- residual value is the company value at the end of the last "n" year of explicit forecasting;
- as much as n is bigger, the discounting rate is bigger, as much the residual value is reduced getting close to zero – and it is even zero if we exceed 15-20 years of prognosis;
- as much as n is smaller, the discounting rate is reduced too, as mush the residual value is higher.

The method is based on the evaluation of actions by forecasting on a horizon of 5-10 years of the cash flows available for shareholders, cash flows taking into account: net current profit (after taxation), adding the redemption and the provisions and minus the capital expenses (investments), minus the raise of operating capital, plus the raise of debts bearing interests, after taking out of these the repayment of credits.

The calculation formula:

$$V_0 = \sum_{p=1}^{n} \frac{CFNA_p}{(1+k)^p} + \frac{Vterminala_n}{(1+k)^n}$$

where:

Vo = company value

$CFNA_p$ = net cash flow available for shareholders in p year;

$Vterminală_n$ = terminal value (residual) at the end of n year;

n = prognosis horizon;

k = discounting rate (usually the balanced average cost of capital - CMPC of WACC - weight average cost of capital).

3. The application in practice the method of discounted cash flow

We will point out the application in practice the method of discounted cash flow using the example of S.C. RO LEASING S.A. Craiova, company having as object of activity the financial leasing for movables and fixed property for clients in almost entire country.

Although the company was set up 5 years ago, it acquired a registered capital of 13 billions lei, contract which generated incomes of almost 300 billions lei. The company is set out only by capital accounts, and its development perspective needs high financial sources, a fact that determined the Supervisory Board to propose the General Meeting of Shareholders a growth of registered capital with 6-9 billions lei, a fact that imposes the evaluation of shares.

Discounting rate, k, is the minimum rate of profitableness an investment must acquire in order to satisfy the shareholders requirements of profitability. In case of S.C. RO LEASING S.A., the discounting rate is the cost of capital accounts, as the company is not set out from other sources.

The determination of shares value supposes to follow the next steps:

1. CFNA forecasting of 2004-2008 horizon.

This is performed s follows:

- thousands lei -

Cr.		Performances		Forecasting			
		2003	**2004 BVC**	**2005**	**2006**	**2007**	**2008**
1	Total incomes*	29.442,8	26.200	29.820	26.700	24.735	24.760
2	Expenses at 1000 lei Total incomes - lei	823,6	883	880	870	860	850
3	Total expenses	24.247,9	23.150	26.250	23.230	21.300	21.060
4	Gross profit	5.194,9	3.050	3.570	3.470	3.435	3.700
5	Net profit	3.861,1	2.250	2.600	2.600	2.580	2.775
6	Redemption	330	350	350	350	350	350
7	Investments	620	150	200	200	200	200
8	Growth for the need of working capital (NFR)**	4.254,4	-1.453	217	-187	-118	+2
	CFNA (5+6-7-8)	**-683,3**	**3.903**	**2.613**	**2.937**	**2.848**	**2.923**

*Prognosis of real incomes

		2005	**2006**	**2007**	**2008**
From contracts at 31.12.2003 ($)		378.000	75.790	24.380	
From contracts at 31.12.2004 ($)		331.200	224.000	-	
From contracts at 31.12.2005 ($)		189.000	252.000	189.000	
TOTAL	($)	898.200			
rate leu/$		33.200			
Incomes	millions lei	29.820			
From contracts 2006			189.000	252.000	189.000
TOTAL	($)		740.590		
rate leu/$			36.000		
Incomes	millions lei		26.700		
From contracts 2007				189.000	252.000
TOTAL	($)			654.380	
rate leu/$				37.800	
Incomes	millions lei			24.735	
From contracts 2006					189.000
TOTAL	($)				630.000
Incomes	millions lei				24.760

Contracts 2004 = 562.500 $ inclusive VAT
2004 = 472.700 $ without VAT

Incomes for 2 years (472.700x168=795.200)

Encashment
- 30% in 2004
- 40% in 2005
- 30% in 2006

Contracts 2005 = 500.000 $ inclusive VAT
2005 = 420.000 $ without VAT

Incomes for 2 years (420.000 x 1**,5** = 630.000 $

Encashment	2005	189.000
	2006	252.000
	2007	189.000

** Prognosis for the growth of NFR

NFR = Stocks + Book debts + Regulating assets – Current debts – Regulating liabilities

NFR $_{2003}$ = 4.368,8 - 1.343,9 = 3.024,9 mil. lei

NFR $_{2002}$ = 3.415,2 - 4.644,7 = -1.229,5 mil. lei

Ratio NFR$_{2003}$ in total incomes $= \frac{3.024,9}{29.442,8} 100 = 10,3\%$

NFR$_{\text{medium 2002-2003}} = \frac{3.024,9 - 1.229,5}{2} = 897,7 mil.lei$

Ratio NFR$_{\text{medium}}$ in total incomes $_{2003} = \frac{897,7}{29.442,8} 100 = 3\%$

Taking into consideration the high track between the two ratios, we considered as relevant to choose a value placed in this interval, respectively 6%.

Annual growth of NFR

- thousands lei -

	2003	2004	2005	2006	2007	2008
Total incomes	29.442,8	26.200	29.820	26.700	24.735	24.760
NFR/VT	0,103	0,06	0,06	0,06	0,06	0,06
NFR	3.024,9	1.572	1.789	1.602	1.484	1.486
Growth NFR		-1.453	+217	-187	-118	+2

2. The determination of the discounting rate (K)

According to Gordon and Shapiro formula, the cost rate of capital account is given by the:

$$K = \frac{D_1}{P_0} + g;$$

$$g = b \cdot R_f;$$

where:

D_1 = dividend per action for next year (2004);

P_0 = share current price (book value$_{2003}$);

g = rate of constant annual growth of dividend;

b = capitalization rate for net profit;

R_f = financial profitability (net profit /capital account).

$K_{2003} = \frac{26.983,135}{233.568} 100 + 8,24\% = 11,56\% + 8,24\% = 19,8\%$;

$g = b \cdot R_f$ = 40% x 20,6% = 8,24%;

b = capitalization rate in 2003 = 40%;

$R_{f\,2003}$ = 20,6%

3. Forecasting the terminal value at the end of year 2008

$$V_{\text{terminal } 2008} = \frac{CF2008}{K - g} = \frac{2.923}{0,198 - 0,0824} = \frac{2.923}{0,1155} = 25.300 \text{ mil. lei}$$

4. Value determination per share

a. Determination of discounted cash flow available for shareholders:

	2004	2005	2006	2007	2008	Total

1.CFNA	3.903	2.613	2.937	2.848	2.923	
2. Discounting factor corresponded to the rate of 19,8%	0,83	0,70	0,58	0,49	0,41	
3. $CFNA_{discounted}$	3.240	1.829	1.703	1.396	1.185	9.353

b. Determination of discounted terminal value
Vterminal 2008 = 25.300x0,41 = 10.373 mil. lei
c. Company value
V_o = 9.353+10.373 = 19.726 mil. lei
No of shares = 80.050
Value per share = 246.420 lei

4. Conclusions

Although it seems quite simple, the discounted cash flow method is, as we stated at the beginning of this article, very complex due to the fact that it is based several elements which must be evaluated, so the subjectivism plays a very important role. The predictions of some cash flows, residual value, rated average cost (and, implicitly, of the discounting rate) is very difficult to perform for companies which are not quoted in the stock market. According as more and more companies shall be quoted at the Stock Market in Bucharest, this method will be used more often also in our country, given the fact that it also has the main advantage as it is more complete and satisfying from the conceptual point of view.

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DOCTRINAIRE ARCHIETYPES OF MACROECONOMIC POLITICS

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Abstract:
In modern and democratic society conditions, which is characterized by a multitude of economic doctrines, as a reflection of the multitude of parties' system that exists, economic policies are directed and appreciated in comparison with the main doctrinaire currents in social and economic life. But, solving social and economic problems can't offer the expected results by using only the economic policies generated by the classical and neo-classical theories thus being necessary the emerging and development of some new theories.

Keywords: macroeconomic policy; doctrinaire archietype; economic doctrine; liberalism; neo-liberalism; democratic socialism; Marxist socialism;

1. Introduction

The modern democratic society is characterized by the plurality of doctrines as a reflection of the multitude of parties' system that exists and, as a result, the economical policies are directed and appreciated depending on the dominant doctrinaire currents in the social and economic life. The doctrinaire delimitation of economic policy programs is performed, mainly, depending on the *essential political scopes* followed, these scopes being the ones which implicate the real ideological attitudes and major political options. The essential political scopes are at the basis for elaborating the model and actions strategy and give the fundamental features of the *doctrines of economic policy*.

2. Theoretical Background

In order to performed the aimed scopes, the social-political forces (parties) use the thesis of economic theories they decode and dose according to the practical needs, taking into account of the real economic and social situation, of the way of perceiving the realities and of the social group interests they represent.

So, the *classical and neoclassical theory* described the market relation with perfect competition. In those times, according to A. Smith's views and also to other economists from XIXth century (J.S. Mill, A. Marshall), the state interfered in economy, especially to *create the market institutional frame* and to supervise its observance, and as for the protection and performance of great public works. The request and offer on all markets (goods, capital, work) were flexible enough (fluid), and *the prices* bore the information and made the connection between the consumers and manufacturers in order to perform the assignment of resources without too many difficulties. This was, broadly, the situation formalized by the classical economic theory and the early neoclassical one, theories used with enough success by the *traditional liberalism*.

To the development of the complexity of economic processes, and also the extend of economic exchanges to the national and international level, the request and offer on the markets of goods and labor became more rigid (more inflexible), and *the prices reduced consistently their capacity* of *correct information*, especially due to the pressure and dominance on certain markets by monopolies oligopolies. In the same time, they developed the effects of externalities, *the public sector developed* where another type of relations and mechanisms are being used others than the market ones and another type of *decisions,* and namely, the political and administrative ones. Also, beside the traditional economic cycles (decennials) and where, usually, the contradictions and disfunctionalities were gradually resorbed, without the intervention from public authority, *in economy occurred highly chronic derangements* reflected in the intensification of unemployment, intensification of inflation, underuse of production capacity, economic stagnation, bankruptcy for a great number of companies;

the most dramatic moments had been the ones of the big crisis 1929-1933 and of the stagflation in the eight decade (1970-1980).

In order to explain the new phenomena and for applying some measures under the power of public authority for removing the causes or the harmful effects, there occurred and developed a series of *new theories* as: theory of monopolist competition, Keynesian theory of macroeconomic balance, theory of endowment with factors (Heckscher, Ohlin, Samuelson), theory of externalities, theories of growth and economic development, theory of economic cycles and technical progress.

But it had been noted that the resolution for economical and social problems can not give expected results using only the economic policies generated by the mentioned theories. Therefore, it was developed especially the economic theory of welfare (welfare economics), and on its basis, the theory of state welfare and of public sector. These theories offer the basic ideas in order to elaborate the instruments necessary to extend and manage the public sector in economy and the state higher implication for solving the social problems.

In the same time, based on the studies performed, it had been noted that not all economic and social problems can be efficiently solved only by public institutions intervention and by regulations. Therefore, it occurred the need to use also the moral precepts and religious confessions and, first of all, to *moral Christianity* percepts predominant in the Euro-Atlantic space. In the same time, it had been noted that the economic problems can not be solved without *social peace* and, that is why, there occurred and had been developed the non-corporatist theory and the theory of *negotiated economy*.

All these conditionings and preoccupations made up an impressive stock containing economic and social knowledge available for the political forces (parties), but the economic knowledge have an explanatory role and can not be applied implicitly. Thereby, the knowledge of economic theory is converted in principles and management techniques and in instruments of economic policy.

Based on the knowledge offered by the economic and social theories, the contemporary politic parties make a group of macro and microeconomic actions and measures which they combine and doses in specific ways so that they can perform better the essential objectives enclosed in the respective doctrines and expressed in *politic programs.* In programs are enclosed: legal regulations for the control of economic and social phenomena, fiscal, budgetary and monetary instruments used to stabilize and perform the macroeconomic balance, adjusting measures and economy structural adaptation, as well as social politics in the domain of social security, education, health and culture. In other words, the economic knowledge is adapted to the specific of political actions directed towards the proposed scopes.

In the literature concerning the theory of contemporary economic policy are a variety of ideas and currents which can be classified in different *doctrinaire platforms,* not as much as depending on the implication level of the state in economy, as *depending on the ideological principles political scopes aimed.* The implication of the state in economy is like a method or a technical way by which political scopes can be reached, which supposes the separation of ideological side from the technical one in order for the decisions to be realistic and to be able to become operational.

In modern societies there are *major political-economic scopes* which can define the main characteristics of the economic policy doctrine, namely: a) efficiency in use of resources; b) protecting the individual liberties; c) equity or justice in assigning the incomes; d) individuals' equality. These scopes can be defined in various ways and they can be granted different percentages from the political action. So, for a *classic liberal* the dominant politic scope is the individual liberty and efficiency, for a *neoliberal* the fundamental politic scope is the social justice defined especially in the conditions of individual liberties and economic efficiency, while for a *socialist* the prior politic scope is equality in rights based on the social fraternity or solidarity.

Political scopes can be attained by certain methods and namely: by using the *market mechanism* in the allocation of resources, or by allocating the resources by *the mechanisms of public power* and of state intervention. Even if it is tried to politicize these alternatives, at an attentive analyzing it results that the choice of methods is basically technical, ultimately connected with the features of goods and services or of the application domain, and also the efficiency of assignation. So, in economy there are goods and services or processes which impose the production and capitalization by the market relations system (food, clothes, comfort), and other categories of goods and processes which impose

the intervention of the state (national security, law issuance, macroeconomic stability) as they can not be produced in the private system nor in distribution using the market system.

The plurality of political scopes with their realizing solutions, generate a great diversity of conceptions and currents which can be systematized based on the following *fundamental doctrinal platforms*: liberalism, neo-liberalism, democratic socialism and Marxist socialism. Each of these doctrinaire currents emphasis a certain principle or political scope which, on one hand, become dominant, and on the other hand, enter in conflict with other principles or political scopes inside the system.

Therefore, *the classical liberalism,* which has more of a theoretical and historical than a actual practical one, based on the principles of individual liberty and economic efficiency, while the *neo-liberalism* aims both the individual liberty and efficiency, but also the equity and social justice. *The democratic socialism* aims as essential scopes the individual liberty to choose, equality in rights and opportunities, but also fraternity as a form of cooperation manifested by social solidarity. Beside the democratic socialism, the variant of *Marxist-Leninist socialism,* also called as fundamentalist, takes into account another structure of essential political scopes generated by the modification in the interpretation method for the principle of fraternity to which is opposed the class struggle and antagonistic interests between the adversary social groups (workers and middle class).

3. Conclusions

Not even the classical liberal doctrines and the neo-liberal ones as also the social democratic ones could not answer entirely to the requests in the modern real, social, economic and political life, and also to all social interests. That is way toward the mid of our century there appeared new doctrines based on combinations between essential liberal, neoliberal and socialist political scopes, but also on a series of values as Christian democratic ones, the ones concerning the protection of environment, the ones of social or national order, etc. Among these, by grafting the values of moral Christianity on the neoliberal principles, there resulted, in several countries in the Euro-Atlantic area, a doctrine having a great success to population, namely, *Christian democracy*, having as essential political scopes: individual liberty, efficiency, equality or social justice and also friendly Christian fraternity and solidarity.

When some of the principles or essential political scopes listed were replaced with other values as the ones for social, national or ethnic disciple, the ones based on class struggle (Marxist socialism), or when these values were granted with excessive percentages or even exclusive, there resulted extreme doctrines which evidently leave the spirit and democratic frame.

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CONCRETE ASPECTS CONCERNING THE SYSTEM ANALYSIS IN DECISION ASSISTANCE FOR THE MANAGEMENT OF A PORTFOLIO OF DERIVATE FINANCIAL PRODUCTS

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Abstract:
A successful projection of a decision assisting system supposes a good formulation and understanding of the problem, emphasizing the organization's informational needs. This understanding can lead to a clear differentiation between the system analysis ("what has to be done?") and system projection ("how it must be done?").
The paper makes a complex study over the activities and informational fluxes usually run by the management activity in order to establish the general requests which shall be provided by means of an information system for decision assistance for the management portfolio.

Key words: *decisional model, model of objects, classes of objects, association of relations*

The scope of the analysis system is to know what has to be developed [7]. Before starting a complex analysis process, it is welcome the definition or the system requests which has to be designed, in order to assist the management decision for a portfolio of derivate financial products.

The definition of the system request has as starting point the formulation of the decisional model [5], which begins from the following situation: *In the conditions of an unstable market, which offered not very satisfactory capabilities, can we obtain a portfolio to protect the investment of capital, and not only, but to offer also an additional income?*

We consider that if we disposed of a model for decision assistance, well founded theoretically, to analyze the market best derivate financial products, which we can then group in portfolios, we would succeed to demonstrate that their profitableness is high enough. In other words, the model supposes another question: *If I invest in financial derivates and I want to built a portfolio good enough in order to exceed as profitability a certain asset, what kind of futures/options contracts should I have to select, how many of each, in what moment?* Moreover, the initiation of speculative operations and headging over the portfolio of derivate financial products obtained will be able to provide not only protection, but also an additional income.

From the formulation of the decisional model there come off 2 important stages of the decision simulating process in order to support the management of portfolio:

- the decision simulation for obtaining a strategic portfolio out of derivate products and a secondary portfolio made of corresponding supporting assets, needed for various comparative studies;
- the decision simulation for initiating the operations with derivate financial products using **specific stock market instruments.**

The reason for breaking in two stages takes into account the „divide et impera" general principle [4] which proved its use no matter of the decisional context. Decomposing the decisional situation which represent a significant degree of complexity into smaller parts and more accessible, made out of elements which can be modeled separately, constitute a decisive factor for a better understanding and in order to obtain a correct evolution in way as operative as possible.

The system requests base on the following requirements from the management of portfolio:

- Modernization of the decisional act by means of precise and operative data provided by the informational system;
- Provision of a general optimum and on domains of activity, by means of tactical, strategic, and operational management decisions;
- Capitalization of transaction activity from the market of financial derivates;

- Usefulness of data provided by the new system into a modern information form: reports, synthetic indicators, composite charts, with a relevant content, displayed on the computers monitors;
- Provision of routine decisional processes by means of the new system processing, inclusive the provision of a coordination of the informational and operational system;
- Provision of a scientific decisional process, based on static and dynamic mathematic models dedicated to specific processes from the stock market domain, and also the use of some mathematic functions adaptable to this domain;

In comparison with the definition of requests, which in our attention concentrated on the outside perceived behavior, now it wants to obtain an inside image of what the system must do. In other words, the analysis defines a model of the decisional domain, independently of any technical detail. What does this model contain? It contains the domain objects and classes, with their specific relations and behavior. It must not be forgotten that the analysis is developed inside the limits marked in the previous activity and that, together with it operates into the space of an iteration. Therefore, what is obtained is only a part and not the entire system, and the enclosing domain is well delimited.

The steps to be followed for obtaining the model are the next ones [3]:

1. Identification of objects and classes
2. Identification of associations and aggregations
3. Define the class attributes
4. Refining the model by identifying the relations of inheritance and grouping the classes into modules

1. Identification of objects and classes – represents a valuable source of information and suggestions for the domain of problem to be informed

The action to identify the main types of candidate classes has as source of information, the requirements specification and the formulation of decisional model for the management of portfolio. Normally, this thing is done by examining all the substantives from the text of used to formulate the objectives, the imposed requests and the proposed functions, obtaining a class for each substantive. *This might be:*

Futures contracts	Financial derivate quotations	Trader
Options on futures contracts	Futures contracts quotations	Clients
Support assets	Option quotations	Portfolio
Operation	Support assets quotations	BMFMS[7]
Transactions	Brokerage agency	Assignment
Broker	Manager	Order

From the classes identified we start cancelling the incorrect classes, meaning those which are included in the following category:

- *Redundant classes'* ↔ 2 classes expressing the same information. *For example*: the classes *futures contracts quotations* and *option quotations* are redundant classes as they express the same notions as *financial derivate quotations* reason for which they shall be excluded.
- *Irrelevant classes* ↔ classes which do not bring any necessary information for modeling the problem. *For example*: class *bmfms* describes rather the entire system and does not bring any information in the modeling system.
- *Vague classes* ↔ classes which are not clearly defined. *For example*: classes *data*, *manager*.
- *Attributes* ↔ are identified as classes which initially describe individual objects, but which can be reformulated as attributes of other classes and they will not be kept *(not the case)*
- *Operations* ↔ there had been identified classes which actually describe operations applicable to objects and shall not be kept in building the model. *For example* class *assignment* is an operation applicable to *order, transactions, trader x* class.

2. Identification of associations. Associations express the existence of semantic correlation between classes of objects. An association instance is called *link* and is a group of realizations of corresponding objects. In our case, there can be made the following connections:

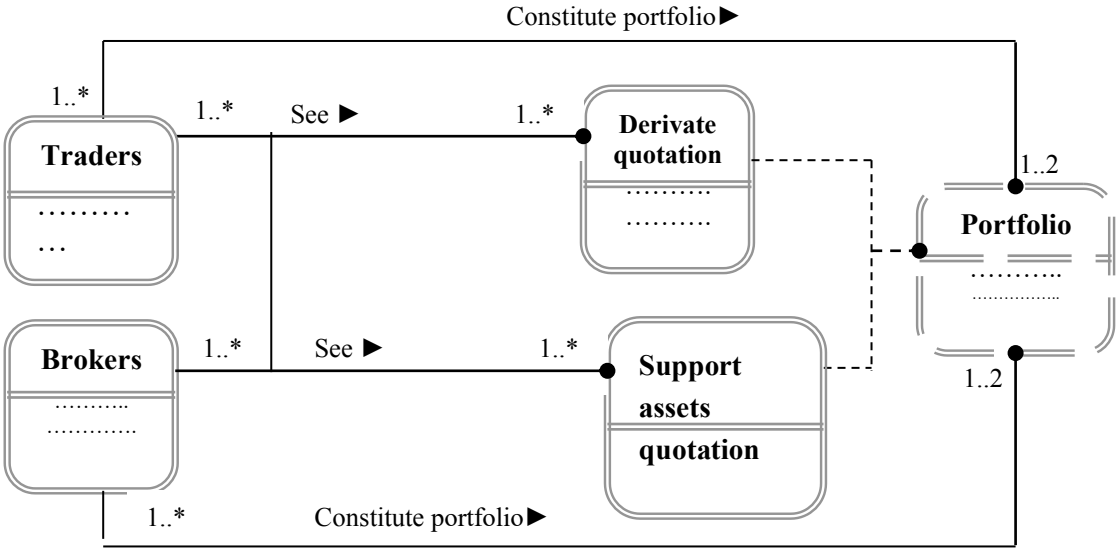
Futures contracts are daily **quoted** at *BMFMS*

[7] Monetary Exchange – Financial and Stock in Sibiu

Options on futures contracts are daily **quoted** at *BMFMS*
Support assets are daily **quoted** at *BVB*
Financial derivate *quotations* are **seen** by *brokers* and/ or *Traders*
Support assets *quotations* are **seen** by *Brokers* and/ or *Traders*
Orders ***generate*** *Transactions*
Traders ***run*** *Transactions*
Brokers ***run*** *Transactions*
Orders are ***issued*** by *Clients*
Orders are **traded** by the *Trader*/*Broker*
Clients ***issue*** *sale/ purchase Orders*

The association is represented by a continuous line between the classes of corresponding objects and can have a name and a sense, with the scope to specify the properties of the respective class at association, respectively: multiplicity, navigability, visibility and changeability.

In *Figure 1* is represented, as example, the association which expresses the connection between traders/ brokers and the strategic portfolio they want to obtain. One or more ***(1…*)*** traders/ brokers can ***see*** one or more ***(1…*)*** quotations for the financial derivates and/ or support assets. Seeing the conditions, one or more ***(1…*)*** traders/ brokers based on a defined algorithm can ***constitute*** portfolios. The portfolio is not a actual class, but an association – class which has the features of a class: attributes, operations or other proper associations. Multiplicity in this association is ***(1…2)***. Value **1** from the multiplicity expresses hereby the collocation "constitutes **a** portfolio" of derivate financial products or/ and **a** portfolio of support assets, so maximum **2**. The second portfolio is made only to illustrate a comparative situation in the operations management with derivate financial products.



For the graphic representation is used the usual class symbol, connected through a interrupted line to the respective association, the name being the same one both for association and for class it is realized by.

3. Attributes identification

The current status of an object is described by one or more attributes or instance variables. The general notation of attributes is the following:

Visibility **name** [*multiplicity*] **:** type_data = initial_value {*list of properties*}

Where: *visibility* can have one of the values: **+** *(public attribute),* **–** *(private attribute*, *respecting the package principle)*, **#** (*protected attribute*);

[*multiplicity*] indicates the fact that the respective attribute can have several values. Making reference to the number of quotations for a futures contract and/ or options in a month of transactions (except for the saturdays and sundays): *#quotation [0...22]: currency* mentions that the protected attribute *quotation* can have different values from 0 to 22 of currency type, *multiplicity* 0 indicating

that is also allowed the absence of value for this attribute, respectively the null value;

: type_data indicates the data nature in specific terms of a certain language;

= initial_value is an expression of which value is attributed automatically in the moment when an object, from the respective class, is created;

{*list of properties*} is a list of properties additional to the attribute;

In the designing process we can also meet notations like:

Futures contracts. Maturity ↔ indicating the fact that the *maturity* is an attribute of the *futures contracts* object

Afterwards, the attributes can be further modified depending of a series of new elements which can be discovered in the analysis stage, which is why **it is better to**:

- Give a higher importance to main attributes, because afterwards they will be refined;
- To ignore the derivate attributes;
- To mention the reference attributes, similar to the foreign keys from the relational model.

Taking into account the previous recommendations there will be made the attributes dictionary where are mentioned all the descriptive details of each attribute, no matter of its appurtenance to a certain type of class or association. So, for each attribute shall be established the identifier uniquely associated at the level of the entire data base, type, length, and validating condition, all these elements being established depending on the requests and restrictions imposed by the data administration system [8].

4. Refining the model – supposes the introduction of inheritance relations between the classes representing common aspects, building a *super-class* or delimiting a general class in specialized sub-classes. Analyzing the description of each class, it is natural a refining of the object model, therefore creating:

- Super-class: **quotations**, out of which to drive the classes ***financial derivate quotations*** and ***support assets quotations;***
- Super-class: **operators on market**, out of which to drive the classes ***trader, broker*** and ***client,*** as trader, broker, client are the main operators implicated in the transaction process;
- Super-class **financial derivates** out of which to come off the class ***futures contracts*** and class ***options***
- Sub-classes for: **sale orders** and **purchase orders**, as from the analysis of the transaction process was deducted the fact that are elaborated distinct orders depending on the operation initiated on the market.

Grouping the classes into modules is recommended when the number of classes identified is relatively important, on the contrary we can consider that there is a single module offsetting with the system. We preferred to divide the system in two modules grouping the classes identified depending on the activities run in the same sphere. Therefore, we have:

- **Portfolio module** which will group the activities leading to the definition of the structure of a strategic portfolio;
- **Transaction module** which will group the activities beginning at the run of transactions in the stock market area.

These stages allow the definition of the object model and its description. The representation known as object chart [6] is of a real use when we have to define, from the logic and physic point of view, the structure of the data base.

Conclusions:

The structure of the data base represents the constant aspect, invariable or, correctly said, less variable. A good object model reduces the risk of major changes in the structure of tables and restrictions, conferring stability for the data base and reducing the efforts for maintenance after the application installation.

Only analyzing in detail the object system we can detach the directions on which hardware and software resources must be directed to for the support system for decision assistance for the operation

management with derivate financial products.

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