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SOCIO-ECONOMIC THEORY BASED STUDY OF BUSINESS ORGANIZATIONS DYSFUNCTIONAL

Ph.D. Professor IACOB Constanta
University of Craiova, Romania
Street Aleea II Rovine, no.8, Craiova, Romania
Cod 200000
e-mail : iacobdoina@yahoo.com

Ph.D. Lecturer COCOSILA Mihaela
University "SPIRU HARET" of Craiova, Romania
Street Brazda lui Novac, no. 4, Craiova, Romania
Cod 200000
mihaela.cocosila@spiruharet.ro

Abstract

While the process of entropy in nature is by itself, the economic process by human activity is directly dependent on the consumption of goods entails entropy, ie degradation by failures that occur in this process.

Based on the law of entropy, we can say that simply is not enough energy to develop and maintain order, information is needed on how to use energy.

By analogy with the irreversible degradation of energy, I started from the idea that the area of enterprise management, energy is the ability to achieve decisive acts effectively against business objectives. Degradation of energy is given by the depreciation information as waste of human resources, technical and financial aspects are an important part of the hidden costs and regulate activities which affect the performance of business failures. In this context, relying on empirical testing of explanatory variables to determine success factors, using multiple regression, we tried to emphasize a series of failures that occur at their small-business liberal and ways to reduce their. Once detected disfuncționalitățile can move on dynamic modeling to predict trends taking into account revenue, results and time. The conclusion we reach is that socio-economic theory of organization and its method of diagnosis and evaluation based on the study of dysfunctional activity is a possible means of measuring the effect of creating organizational value of reducing hidden costs.

Keywords: control, creativity, hidden costs, value creation, mathematical modeling, performance.

JEL clasification : J24, M12, M48, M54

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INTRODUCTION

After several years dedicated resettlement management control which main task was to implant controller processes to reduce costs and strict application of rules, economic entities are facing today with new issues that concern their management control system and can be made following manner: the management control system (tools, methods and devices) should be used by an entity without harming its business development?

If Bouquin H. (2006) is based on two complementary logic of management control, financial performance logic and logic that technical and economic performance, Savall and Zardet (2004) outlines the idea that "management control" or management control involves two dimensions: the First, a strategic and economic dimension consisting of operators selection rules to achieve its objective, on the other hand, an organizational and psychosocial dimensions that lead to inciting people to act according to rules of the operators and, therefore, it must subject to socio-economic analysis.

Thus, control acquires new dimensions: In an instrument of coordination is established people within the enterprise, is a means of strengthening the coherence and cohesion within the organization, becomes a process of cross-organizational business activities, is a dynamic process and changes continuously by accumulation of experiences. In other words, management control is the process by which managers get assurance that resources are obtained and used effectively and efficiently to achieve organizational objectives.

Although ambiguity take managerial control of the presence of uncertainty and complexity management intensified human factor, the latter may be considered in the socio-economic management as a lever to create value, the control system becomes a potential vector of change. The strategic plan, the socio-economic control is designed to select business failures and create a "culture shock" or awareness to encourage players to seek solutions in the so-called "phase project".

2. STUDY AND METHOD

2.1. CONTROLLING CREATIV

In the current economic context, the issue of management control system must become a creatively. Through creative means the ability of management control to create added value and influence stakeholders to implement concrete actions in place to exploit resources released from lower costs. In other words, by controlling the management understand the creative process attached, on the one hand, reduce costs, on the other hand, reallocating resources saved. Value creation designed so as to reduce costs and development activities through organizational change. This statement does not embrace the vision of creativity Chiapello Eve (2000) which stresses the importance of organizational context to foster creativity. Basically Chiapello Eve refers to a "creative connection".

Creative management control is a new concept based on a different model of the classic and undoubtedly emerges of what some authors call it "creative accounting" (Hoare, 1995; Raybaud-Turillo and Teller, 2000; Bunea St., 2004).

Accounting is considered an entity created when managers use the leeway available in choice of accounting options for amending the final financial statement presentation and content. In this sense, creativity appeal to the subjectivity inherent in the construction of models accounting choices and organizational actions.

Creativity in the game lies in accounting measurement and representation and not in concrete actions aimed at organizational context. Instead, creating value based on potential earnings converted

to reorganization activities and performance by eliminating inefficiency is a tool for reducing costs increase the value of organizational functions.

Management control must be based currently on creating value, especially for shareholders or by developing activities that produce visible growth in turnover, ie, by detecting hidden performance (Savall, 2003).

2.1.1. Overview of the socio-economic management control

Presenting the concept of creative management control, control system is necessary to study the socio-economic management, based on a different model of the classical paradigm and whose purpose is given by maximizing autonomy behavior entity, ie its ability to negotiate with growth medium .

By controlling the socio-economic management understand a process that integrates control, on the one hand, economic variables (the entity's financial performance, efficiency and effectiveness) and on the other hand, social variables (employee satisfaction).

Socio-economic management control can be positioned in a field managerial control because it integrates conceptual principles, outlined in the fundamental theory of control, on the other hand, has some design features through which it provides instruments and in improving social performance and economic organization.

Summary of socio-economic approach is the rhythm In a research heuristic effective intervention taking into account the effects of entropy.

By analogy with irreversible degradation of energy, consider that in dealing with business, power is the ability to achieve decisive acts effectively against business objectives. Energy degradation is given by the depreciation information as waste of human resources, technical and financial aspects are an important part of the hidden costs and failure to regulate activities affecting business performance.

Change intervention effectiveness is based on three factors: the establishment of a dynamic change across social and organizational innovation process, applying tools of change in steering role for the actors change, adopting a sustainable energy strategy and policy focus to traverse the enterprise.

A series of papers from his work M.P.Follett (1924) and continuing with his work R.N.Anthony (1956, 1965, 1988), R.L.Simons (1987, 1995), A.P.Sloan (1963), J. Pfeffer (1995, 2005), H. Savall (1974, 1975, 2003), Savall and Zardet (2004), Khouatra and Cappelletti (2004, 2007), Cappelletti, Beck and Noguera (2004), Savall, Zardet, Bonnet and Cappelletti (2006), but and Chenhall and Euske (2007) outlines the idea that "management control" or management control involves two dimensions: strategic and economic dimension consisting of operators selection rules to achieve its objective, an organizational and psychosocial dimensions that lead to inciting people to operators to act according to rules, and therefore, it must be subject to socio-economic analysis.

Management control based on the socioeconomic Savall's work (1974, 1975, 2003, 2008) integrates the work of Follet, Anthony and Simons and supplement through a comprehensive and useful methodology. Savall's work is given the particularity that seeks to develop sustainable socio-economic performance of the enterprise based on the idea that sustainable development performance is not possible without reconciliation and social economic performance. This fundamental assumption has been taken and J. Pfeffer (2005) shows that social performance and quality management contribute to the organization's economic performance.

2.1.2. Management tools and methods of socio-economic control

Management tools and methods of socio-economic control are organized around three axes: the axis of management tools, focus and management change costs, focus policy decisions. This methodology has been named in three axes HORIVERT method (Horizontal-Vertical) and applied in over 30 countries in the enterprises and organizations (Cappelletti, Khouatra and Beck, 2007), Figure No.1.

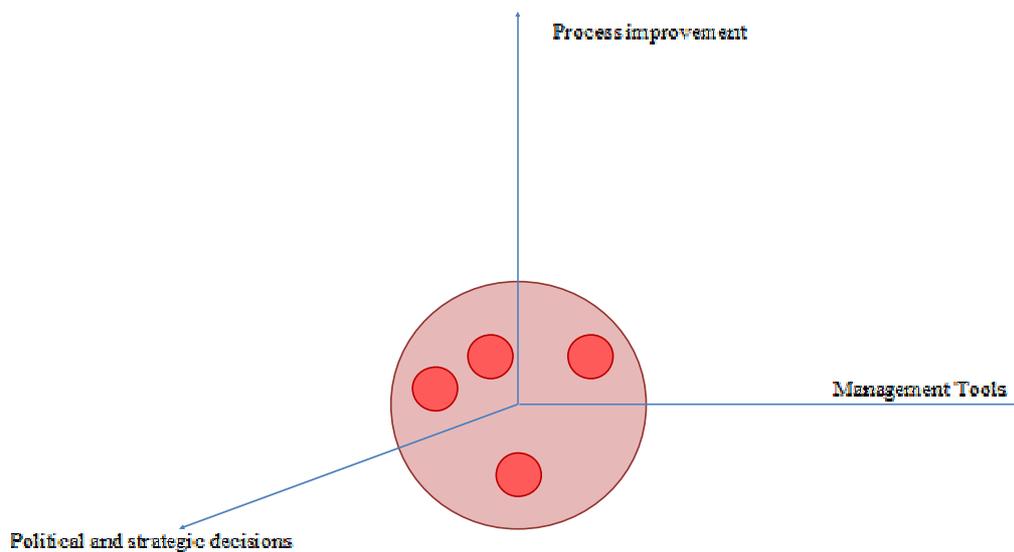


Fig.no.1. Model Horivert

- *Axis control instruments of socio-economic management* is considering six tools for managers, namely:
 - Plan regular activity which formalises negotiable objectives results qualitative, quantitative and financial priority placed at the disposal;
 - Strategic action plan targeting the internal and external torque products or services - marketing, customers, suppliers, technology, material and immaterial investments;
 - Plan of action and budgets;
 - Dashboard which pools indicators relevant qualitative, quantitative and financial for each employee;
 - Key self-analysis of time management;
 - Key skills for effective assessment of skills available to a team or organization.

All these tools helps managers and stakeholders to guide the organization's business strategy to develop human potential to achieve economic goals.

- *Axis and management change costs* involve all stakeholders and is undertaking an iterative process divided into four phases: failure diagnosis, solution design, implementation and evaluation of solutions retained. The main purpose is to detect hidden costs and their conversion into value added;
- *Axis mobilize political decisions* company management and a steering group meets In an approach which will not take place without managers. Strategic decisions of the management team make sense of the use of instruments and influences the actions which contribute to the strategy and reduce failures.

In a successful process of change is good articulation and a good dose of the three axes outlined above, as follows:

SOCIO-ECONOMIC THEORY BASED STUDY OF BUSINESS...

- Change focus only on process improvement focus may cause long-term economic results, but immediate results are low or zero;
- Implementation of the axis only a weak management tools leads to innovation and creating the potential change process;
- A change in the dominant political goals creates difficulties for energy players and their degradation at the end of the first year of change.

HORIVERT method showed that the dynamics of change that allows sustainable growth and substantial development capability and the organization has as its starting point the intersection of three axes presented and progresses in a spiral starting point of zero.

Although HORIVERT model has been applied in over 30 countries, pointed out that a management model can be applied in the manner in which it was designed. Our assertion is based on the fact that, while management tools are the same worldwide, management practices vary from one company to another, from one area to another and even more so from one country to another (Iacob , 2005).

Microeconomic management problems at the socio-economic control management is a relatively difficult problem both theoretically and practically not formed an appropriate culture in this field.

Management culture that includes values, beliefs, aspirations, expectations and behavior reflected in the types of managers and management styles such practices and will mark prominent organizational culture and firm performance is shy at present scope SME managers in their organizations. Its role is to protect the organization and its employees against the many threats that the company is subject to internal and external environment. Culture management is the basic component in increasing business competitiveness. It is therefore necessary to make up a control model to ensure that the socio-economic management and its integration into the organization's overall information system to increase Performance and boost competitiveness, miniaturized model suitable for all small and with the possibility of extrapolation of observations made .

Thus, each component device group is involved In an intra-firm and inter-enterprise device which allows, as a result of a mini-diagnostic focus on failures that disrupt work effectiveness and efficiency can be assessed hidden costs, losses that added value and to base control of the socio-economic management through its specific tools.

2.2. NEED TO IMPLEMENT MANAGEMENT CONTROL IN SMES AND THEIR FREE ENTERPRISE.

Many enterprises liberal as family medical practices, dental offices, notary offices, law offices, offices of pharmaceutical needs now more than ever, implementing a management system for tracking costs, boost human resources and their strategic development. In other words, companies want liberal, and large enterprises, the management control system effective, efficient and adapted to their peculiarities.

These companies, generally with fewer than 10 employees are subject to severe constraints in recent years policy, which may be exceeded only by the quality of expertise of their leader. For example, doctors, pharmacists, dentists must reduce operating cost structure while maintaining their quality of care. Advocates must develop new products to meet the legal action and fierce competition. Finally, they need to improve management control.

2.2.1. Using linear regression

Of research conducted conclude that, not always, reduce costs is a consequence of increased economic entity's results. For arguments of this idea, we reproduce below, observations and lessons learned from the application of multiple regression. To this end we have worked with actual average data on a target device at which we had a statistical series of 10 years (1999-2008) in which we removed expenditures, revenues and results according to balance sheets. I used Unit Root Test for integrated variables as regression analysis in SPSS to validate this data.

Applying the linear regression in the SPSS 17.0 implies, on the one hand, statistical analysis of correlation between dependent variable and independent variables, and secondly, to determine which coefficients to obtain the regression equation.

Analysis of data correlation can be done separately by analyzing the correlation coefficient correlations between an independent variable and a dependent variable, selected from the group of variables studied, either globally, in the linear regression.

Pearson coefficients are in the interval $[-1,1]$, positive value indicating the direct correlation and reverse the negative correlation (when one variable increases the other decreases).

Correlation coefficient (Pearson) indicate a dependence between the better data as its value is closer to 1 (one assumes a perfect correlation, which is obtained only when a data set is correlated with itself). Also, materiality must be less than 0.05 (which corresponds to statistical assumptions only as of 100 measurements within 5% maximum random results can be obtained due to chance or hazard).

Linear regression correlation coefficient calculation involves group variables, analyzing the practical relationship between a dependent variable and several independent variables. As with correlation coefficient as illustrated above, the computer must be as close to a value to estimate that there is a strong correlation.

It seeks a linear regression to determine the expenditure and income influences (independent variables), considered separately, the results (dependent variable).

2.2.1.1. Linear regression considering as dependent variable and independent variable costs results.

Method applied to linear regression analysis model is backward method, iterative method involving the elimination of independent variables that have the smallest influence on the dependent variables, if these variables are not correlated. In this case, there is one independent variable, so the method used will cover only one phase, namely the calculation of statistical parameters.

In Table no.1 presents the main statistical parameters for the variables considered in the light of the method of regression.

Table no.1. General parameters regression

Model Summary^b

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .939 ^a | .881 | .867 | 83427.81335 |

As can be seen by analyzing the correlation between two variables in terms of R value (Pearson's coefficient - the correlation), the data shows a good correlation and direct.

ANOVA test (table 2) generates a significance threshold of 0, which implies the impossibility of existence of random data in the data series analyzed.

Table no.2. ANOVA test (Analysis of Variance)

ANOVA^b

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|--------------|----------------|----|-------------|--------|-------------------|
| 1 Regression | 4.138E11 | 1 | 4.138E11 | 59.457 | .000 ^a |
| Residual | 5.568E10 | 8 | 6.960E9 | | |
| Total | 4.695E11 | 9 | | | |

Using the regression method allows obtaining a direct relationship between the dependent variable (outcome) and independent variable (cost).

The following table (Table 3), this direct relationship is presented in the form of regression equation coefficients generates.

Table no. 3. Coefficients and their parameters in the regression model

Coefficients^a

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|--------------|-----------------------------|------------|---------------------------|-------|------|-------------------------|-------|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 (Constant) | -48843.524 | 53726.790 | | -.909 | .390 | | |
| Cheltuieii | .151 | .020 | .939 | 7.711 | .000 | 1.000 | 1.000 |

Degree of significance of independent variable expenses is 0, while tolerance is one. While the significance threshold value (which must be below 0.05 for statistical analysis to be valid) determined that errors occurred because of the analysis are very small (0.02), the tolerance must be greater than one-Adjusted R Square (0867) to eliminate the risk of multiple collinear.

Tolerance is a value ($a > 1 - 0.867$), default value since we have only one independent variable, as there are so multiple collinear risk (when the dependent variable has a strong influence on the dependent variable but another independent variable has no strong influence , globally speaking, in a model independent variables separately, although both have strong influences on the dependent variable).

The first regression equation (for results and expenditure) is :

$$\text{Results} = 0.151 * \text{expenses} - 48\,843. \quad (1)$$

The significance of this equation is: if costs increase by a unit increase in 0151 results. Thus, increased spending in direct result of growth but results in lower proportion.

2.2.1.2. Linear regression considering as dependent variable and independent variable income results.

For the second regression model, we follow the same steps as in the first regression model at the results and costs.

From Table No. 4 and Table. 5 Note that this second regression model shows a good correlation (0.954) and materiality 0.

Table no. 4. General parameters of regression

Model Summary^b

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .954 ^a | .911 | .900 | 72375.48344 |

Table no. 5. ANOVA test (Analysis of Variance)

ANOVA^b

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|--------------|----------------|----|-------------|--------|-------------------|
| 1 Regression | 4.276E11 | 1 | 4.276E11 | 81.632 | .000 ^a |
| Residual | 4.191E10 | 8 | 5.238E9 | | |
| Total | 4.695E11 | 9 | | | |

Table no. 6. Coefficients and their parameters in the regression model

Coefficients^a

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|--------------|-----------------------------|------------|---------------------------|--------|------|-------------------------|-------|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 (Constant) | -47855.574 | 45941.062 | | -1.042 | .328 | | |
| Venit | .133 | .015 | .954 | 9.035 | .000 | 1.000 | 1.000 |

As seen, in terms of regression parameters, tolerance (1) and standard error (0015) shows values that eliminate any risks of non-validation of statistical model.

Therefore, in this second case, the regression equation of income and results is:

$$\text{results} = .133 * \text{income} - 47855.574 \quad (2)$$

The significance of this equation is the following: if income increases by one unit, the results increase by 0133. Thus, revenue growth will be directly cause an increase in results but in smaller proportion.

Notes: incomes lead to lower growth than the results determined by expenditure.

To view the dynamics in terms of data and graphics (made with Matlab R2009b), for starters we represent the global dynamics of the three indicators. Thus, it generates three vectors, one for data results, revenues and expenses. Then using specific graphic functions, it generates the appropriate graphs (Fig.no.2).

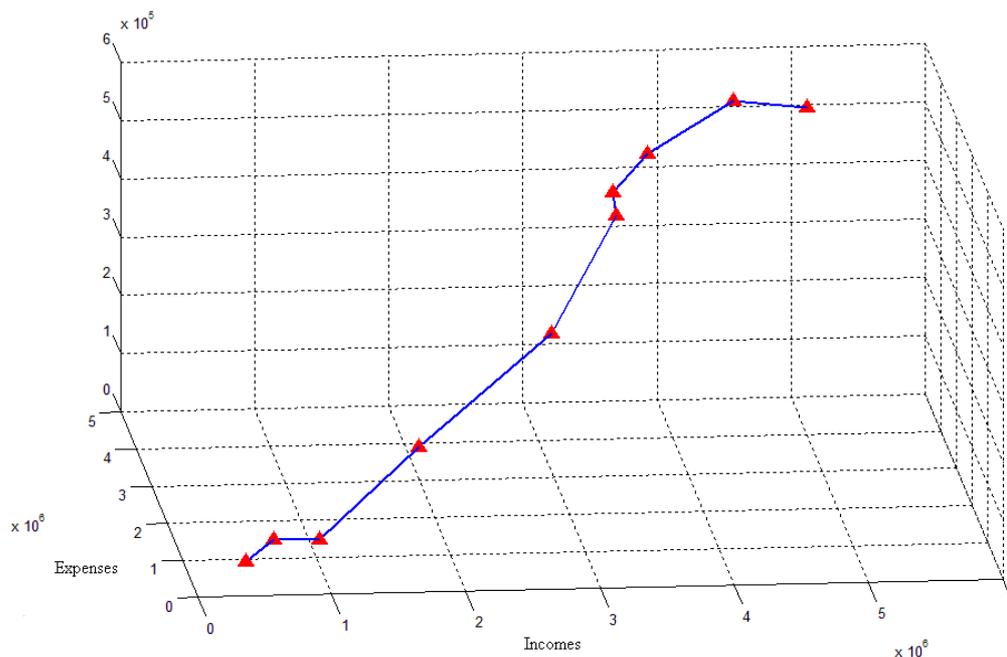


Figure no.2. Global dynamics of the results by income and expenditure

Note that the dynamics of the last four years shows an evolution much less linear than the first period. Also, in the first three years were significant variations unbalanced.

Further, the chart is shown in Figure No.3 residual errors, which shows the statistical variations in revenue and expenditure according to the results. Thus, errors were recorded at a rate increasing in the last six years of the period.

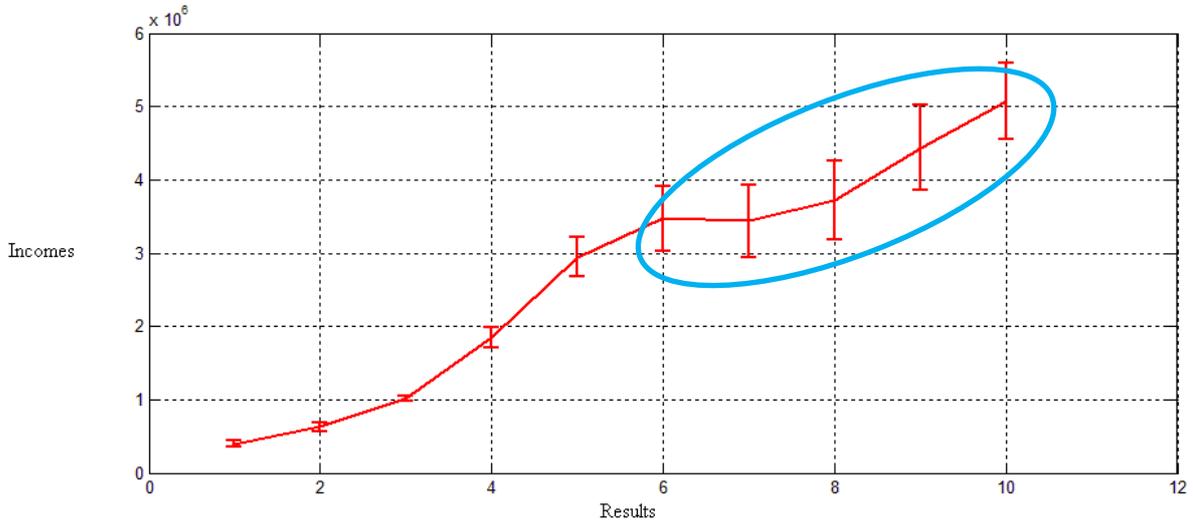


Figure no. 3 Residual errors

Cloud of points (Fig.no.4), its shape, is suspected of direct links between data dependent, which was established based on values and Pearson correlation coefficient (R).

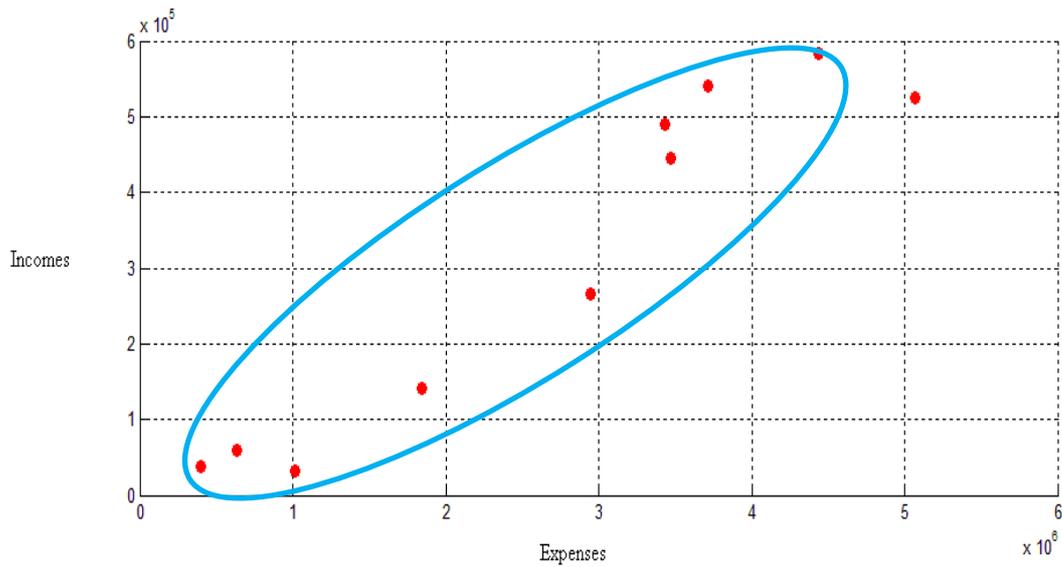


Figure no. 4. Cloud points

The conclusion we reached and expressed from the outset, in that, that, not always, reduce costs is a consequence of increased economic entity's results, it is fair because if pharmacies have material costs an average weight of 83% (supply medicines).

2.2.2. Using survey in detecting hidden costs and performance

If in pharmacies is a direct correlation between spending and results for other activities at their SME and free enterprise, where staff costs have weight, the situation is the opposite, that is a direct correlation between revenue and results.

Based on a survey of a sample divided into the groups according to size, characteristics and nature of their business (50 notary offices, 45 family medicine practices, and five companies of land - their managers and employees in Oltenia), have was found a series of failures that have a common note and can be extrapolated to their level of SMEs, as follows:

- two thirds of respondents report that they have difficulty in managing their customers' phone calls. Most agree that while not neglecting to answer the phone or leave message to redial customers;
- quarter of respondents advertising customers lost due to the fact that some customers do not leave the possibility of further contact or lack of modern equipment for storing missed;
- 45% of respondents lack advertising clients at home when they are visiting to carry out the services required;
- 30% of cases of loss of customers due to lack of timeliness in delivery of services requested;
- 99% of respondents report that they have never done a study to measure customer satisfaction, their belief is induced indirectly by the number of customers we have compared with other similar entities;
- 85% of employees motivated lack of communication on the line of novelty in the business aspect in some cases leading to the achievement of poor service;
- 25% of cases there is a clear division of tasks leading to delayed implementation of services required;
- 38% of cases occur in the influence of exogenous factors that lead to achieving the lateness of the services required by customers;
- emergence of new customers who do not know "the rules" (28%) and steal time and cause tensions on those providing services;
- 38% advertising absence or tardiness issue with the rules on their business line;
- 72% of employees for only 36% of their managers human resource matters;
- 65% of advertising intervening lack of adequate space for the activity in terms of efficiency, privacy and comfort, both for themselves and for customers;
- for 97% of respondents noted the lack of subscriptions to magazines or as a consequence of large-scale expansion of the Internet, either because of lack of storage space;
- 78% of employees report that they have undergone any training course or lack of time or because higher costs have to bear;
- 100% of respondents call for a state of excessive taxation and more difficult to achieve the expected effectiveness of services.

All these failures lead to the emergence of hidden costs that justify the loss of value and basis for socio-economic management control through its specific tools.

If failures outlined, required a series of measures, including:

- anticipate the current management and business planning for unworked time to remove and reduce the hidden costs;
- measures to attract customers through a better information to them about what charges to be paid and the program with them;
- clearly define the duties, responsibilities and powers of each team member;
- improve the management and staff communication devices;
- increase service quality;
- tracking of customer satisfaction;
- improving working conditions and safety activities, etc..

2.3. DYNAMIC MODELING IN FORECASTING TRENDS

In its ongoing effort surrounding knowledge of reality, man has invented "instruments" in which increasingly sophisticated and easier to work. Modeling is a process of knowledge based on a "tool" with special features: the model. The development of modern science, the analogies are important tools for model-reality sometimes irreplaceable knowledge of real world phenomena and processes.

In general, research can be achieved by deductive or experimental way. The deductive approach to real-world phenomena are observed, analyzed and, following a process of abstraction, it builds a theory (a system of axioms or postulates). Based on the rules of logic are derived theorems and lemmas that lead to certain conclusions. These are interpreted and give rise to conclusions about the real world.

The experimental approach is based on a theory (system of axioms and postulates), which leads to certain conclusions. Designing an experiment and get (data, observations) are statistically interpreted, allowing to reach certain conclusions about the real phenomenon.

In most cases proceed to a combined research, both deductive and experimental. But there are areas of reality where the experiment is not (because of the characteristics of the phenomenon or prohibited to the cost). Need to know to solve this problem by modeling. Phenomenon, the actual system under research and builds a model based on doing his experiments, drawing conclusions, and they reflect the real phenomenon. In this way things are in the economic sphere.

Knowledge and understanding of the financial user segment addressed economic, rigorous analysis of the connections between revenues and results, all depending on time and other parameters motivates us to resort to the practice of dynamic modeling and include it in the methods of financial forecasting. Using dynamic modeling gives us a much clearer picture and detailed analysis of the relationship. The dynamic modeling we can identify periodic or cyclical aspects of the phenomenon studied by default, the time horizon covered.

If the models are adequate, then their solutions can be deduced from knowing the phenomena modeled behavior. Although they say that each has its own nonlinear model theory, they have common features, unifying the strange behavior of their solutions with the corresponding aspect of the phenomenon modeled. The fact that this behavior has not yet been reported is due to the complexity of linear problems whose systematic study began only several decades ago.

Dynamic modeling is based on a software system that is the knowledge of interactions between the flows of information, orders, human resources and material resources etc.. A dynamic model captures the behavior of complex systems, highlighting how their structure determines the trajectory, that behavior over time.

Given the theoretical principles concerning the construction of dynamic models, drawn from the literature, we found that income (Y) is a linear function of assets and capital (S) and the financial result (R) varies in relation to the excess liquidity, where:

$$\begin{cases} \dot{Y} = h_1(I - S), \\ \dot{R} = h_2(L(Y, R) - M). \end{cases} \quad (3)$$

Function which has the variable income and financial results, $L(Y, R)$ is determined exogenously and the supply of liquidity M .

In other words, we used this model all balance sheet items considered as follows:

M - Cash is the total assets

S - Total equity capital are

G - Loans are debts to be paid within a period longer than one year

T - Taxes are debts to be paid within a period of less than one year

Capital can be written:

$$S = s(Y - T) + (T - G) \quad (4)$$

where

- T is short-term credits and loans and tax debts;
- G represents commercial loans and debt;
- Constant and a rate adjustment is in the range (0,2).

Liquidity function is written as the difference between application transactions and profit:

$$L(Y, R) = Y - \beta R. \quad (5)$$

The constants and represent speeds of adjustment and can be considered uniform. If they are different can be a transformation of variables so they disappear.

Substituting the above in the first system, we obtain:

$$\begin{cases} \dot{Y} = -sY - R - (1-s)T + G, \\ \dot{R} = Y - \beta R - M. \end{cases} \quad (6)$$

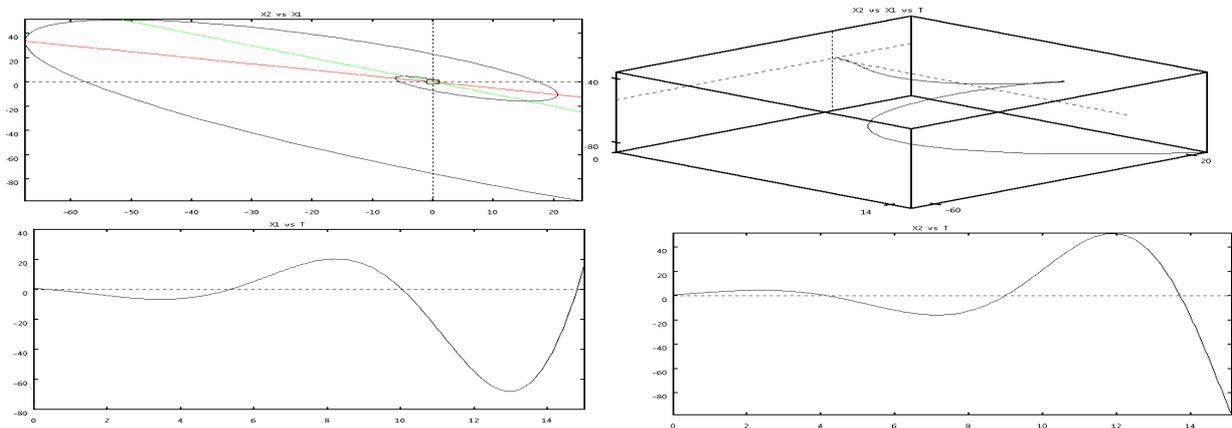
This system is a dynamic system that depends on two affine parameters s and β . If a situation economically feasible, the system admits only one equilibrium point

$$\bar{u}_0 = \left(\frac{M - \beta[G + (1-s)T]}{s\beta + 1}, -\frac{sM + G + (1-s)T}{s\beta + 1} \right) \quad (7)$$

This equilibrium may be stable or unstable, the phase trajectories can converge toward or away from him. Using a computer program for dynamic systems with a mini-diagnostic of the sample observation system can view the evolution of varying parameters and setting the initial data chosen from the application of multiple regression.

Thus, we consider this further due to the following relevant cases:

1. For parameter values $s = 1,5$ and $\beta = 1$ considering the income starting date $Y_0 = 3,1$ u.m. and final financial results $R_0 = 0,23$ u.m. for the year 2009, the system has an unstable behavior, moving from steady state to a state of explosive oscillation, as illustrated in Figure No. 5.



stating:

- a) Income vs. Financial Results;
- b) Income vs. Financial Results vs. Time;
- c) Income vs. Time;
- d) Financial Result vs. Time.

Fig. no. 5. Evolution of the steady-state oscillation explosive

2. Where $s = 0,5$ and $\beta = -0,5$ with initial conditions $Y_0 = 12,7$ u.m., $R_0 = 5,5$ u.m., for 2007, the system admits a periodic solution, being in a state of continuous oscillation (Figure 6).

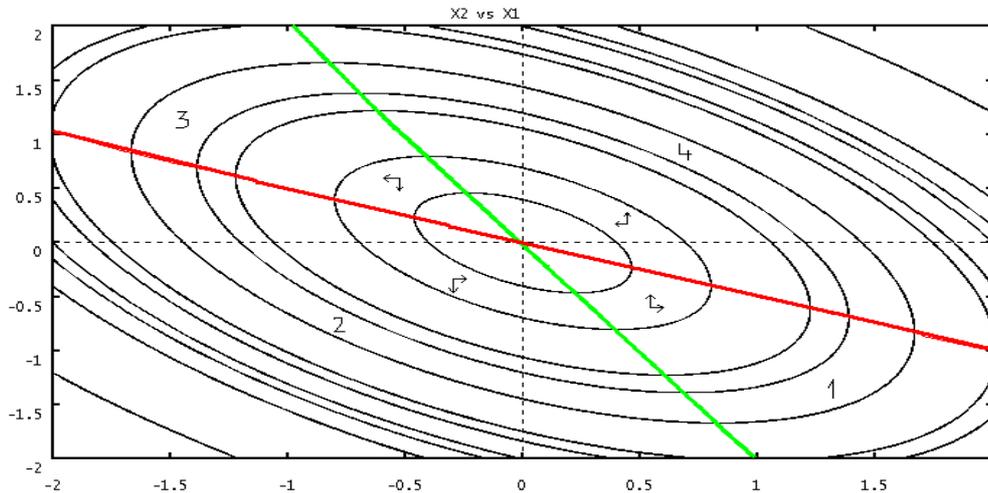
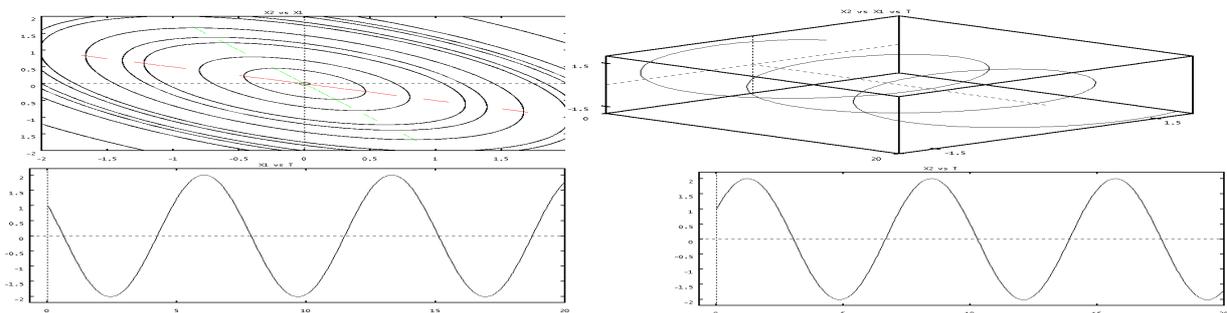


Fig. no. 6. Periodic orbit with four phases

In analyzing the situation presented in Fig.no.6. may notice the following aspects:

- In the first phase, both variables increase, leading a drive to prosperity;
- The second phase corresponds to a period of saturation, the revenue decreases, but the profit increase;
- A statement of falling, depression is the third stage, when both variables decrease;
- The company recorded a fourth phase of recovery situation, recovery, as incomes rise but profit falls (losses occur).

In Figure 7, we can trace developments over time of income that results, when considered.



where:

- Income Vs. Financial results;
- Income vs. Financial Results vs. Time;
- Income vs. Time;
- Financial Result vs. Time.

Fig.no.7. While income developments

Balance point of the system under consideration is an attractive source, ie the system is stable, its trajectories evolve to the point of equilibrium, as illustrated in Fig. no.8.

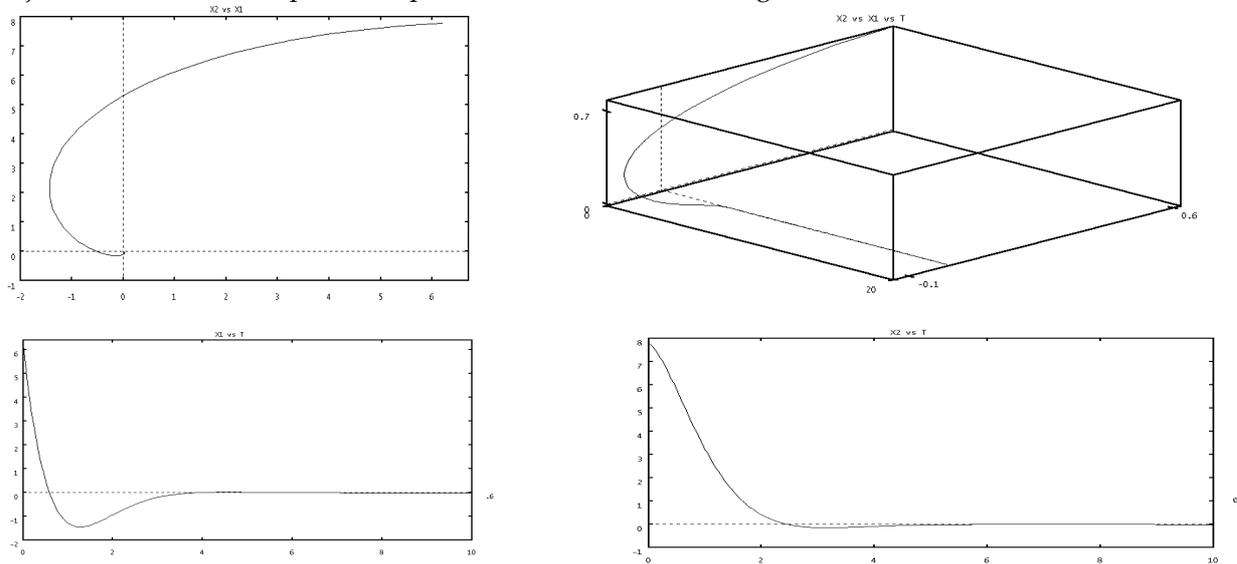


Fig.nr.8. Converges to the steady-state system

Further, introducing the system studied and numerical results using an appropriate computer program, these numerical results are obtained.

Thus, we consider the corresponding numerical data of 2009:

G - debts that must be paid within a period exceeding one year, the corresponding values of 2009, $G = 36.0$;

T - debts that must be paid within a period of less than one year the corresponding values of 2009, $T = 21.3$;

M - total assets, the corresponding value of 2009, $M = 155.1$;

Y - income, the corresponding values of 2009, $Y(2) = 127.6$;

R - financial results, the corresponding values of 2009, $R(2) = 5.5$.

Entering data into dynamic system software properly used, we get:

$$\begin{cases} \dot{Y} = -sY - R - 21,35 + 57 \\ \dot{R} = -Y - \beta R - 155,1 \end{cases}$$

In analyzing the system:

$$\begin{cases} \dot{Y} = -sY - R - (1-s)T + G, \\ \dot{R} = Y - \beta R - M. \end{cases}$$

consider $\beta s \neq -1$

In this case the system admits only one equilibrium point, namely the algebraic system solution:

$$\begin{cases} -sY - R - (1-s)T + G = 0, \\ Y - \beta R - M = 0. \end{cases}$$

which is:

$$\bar{u} = (y_0, R_0) = \left(\frac{M - \beta(G + (1-s)T)}{\beta s + 1}, -\frac{sM + G + (1-s)T}{\beta s + 1} \right)$$

point around which the system becomes:

$$\begin{cases} \dot{Y} = -sY - R, \\ \dot{R} = Y - \beta R. \end{cases}$$

and the associated matrix is $A = \begin{pmatrix} -s & -1 \\ 1 & -\beta \end{pmatrix}$ with characteristic equation

$$\lambda^2 + (s + \beta)\lambda - s\beta + 1 = 0$$

for that amount, that are the product of roots $S = \lambda_1 + \lambda_2 = -(s + \beta)$, $P = \lambda_1\lambda_2 = 1 - s\beta$.

Discriminant equation is $\lambda\Delta = (s + \beta)^2 - 4 = (s + \beta - 2)(s + \beta + 2)$. It cancels the parameters s and β pass the lines of equations $d_1 : s + \beta - 2 = 0$, $d_2 : s + \beta + 2 = 0$ the parameter space (red).

The product P cancel hyperbole $H : s\beta = 1$ (blue).

In summary, the system can be characterized as :

| | Region | Eigenvalue | The type of balance |
|--------------|--------|--|---------------------------------------|
| $\Delta > 0$ | B | $\lambda_1, \lambda_2 \in R, \lambda_1 > 0, \lambda_2 > 0$ | node repulsive (unstable) |
| | C, D | $\lambda_1, \lambda_2 \in R, \lambda_1 > 0, \lambda_2 < 0$ | saddle (unstable) |
| | 3 | $\lambda_1, \lambda_2 \in R, \lambda_1 + \lambda_2 = 0$ | platinum (unstable) |
| | 2, 4 | $\lambda_1 = 0, \lambda_2 = \beta - \frac{1}{\beta}$ | saddle-node (unstable) |
| | G | $\lambda_1, \lambda_2 \in R, \lambda_1 > 0, \lambda_2 > 0$ | node repulsive (unstable) |
| | 7 | $\lambda_1, \lambda_2 \in R, \lambda_1 = \lambda_2 = 0$ | nehiperbolic double degenerated |
| | E | $\lambda_1, \lambda_2 \in R, \lambda_1 < 0, \lambda_2 < 0$ | attractive node (stable) |
| $\Delta = 0$ | 1, 8 | $\lambda_1, \lambda_2 \in R, \lambda_1 = \lambda_2 > 0$ | node degenerated repulsive (unstable) |
| | 5 | $\lambda_1, \lambda_2 \in R, \lambda_1 = \lambda_2 < 0$ | node degenerated attractive (stable) |
| $\Delta < 0$ | A | $\lambda_1, \lambda_2 \notin R, \text{Re } \lambda > 0$ | outbreak repulsive (unstable) |
| | 6 | $\lambda_1, \lambda_2 \notin R, \text{Re } \lambda = 0, \text{Re } \lambda = 0,$ | center (regular solution) |
| | F | $\lambda_1, \lambda_2 \notin R, \text{Re } \lambda < 0$ | outbreak attractive (stable) |

What is presented in graphical form in Figure No. 9.

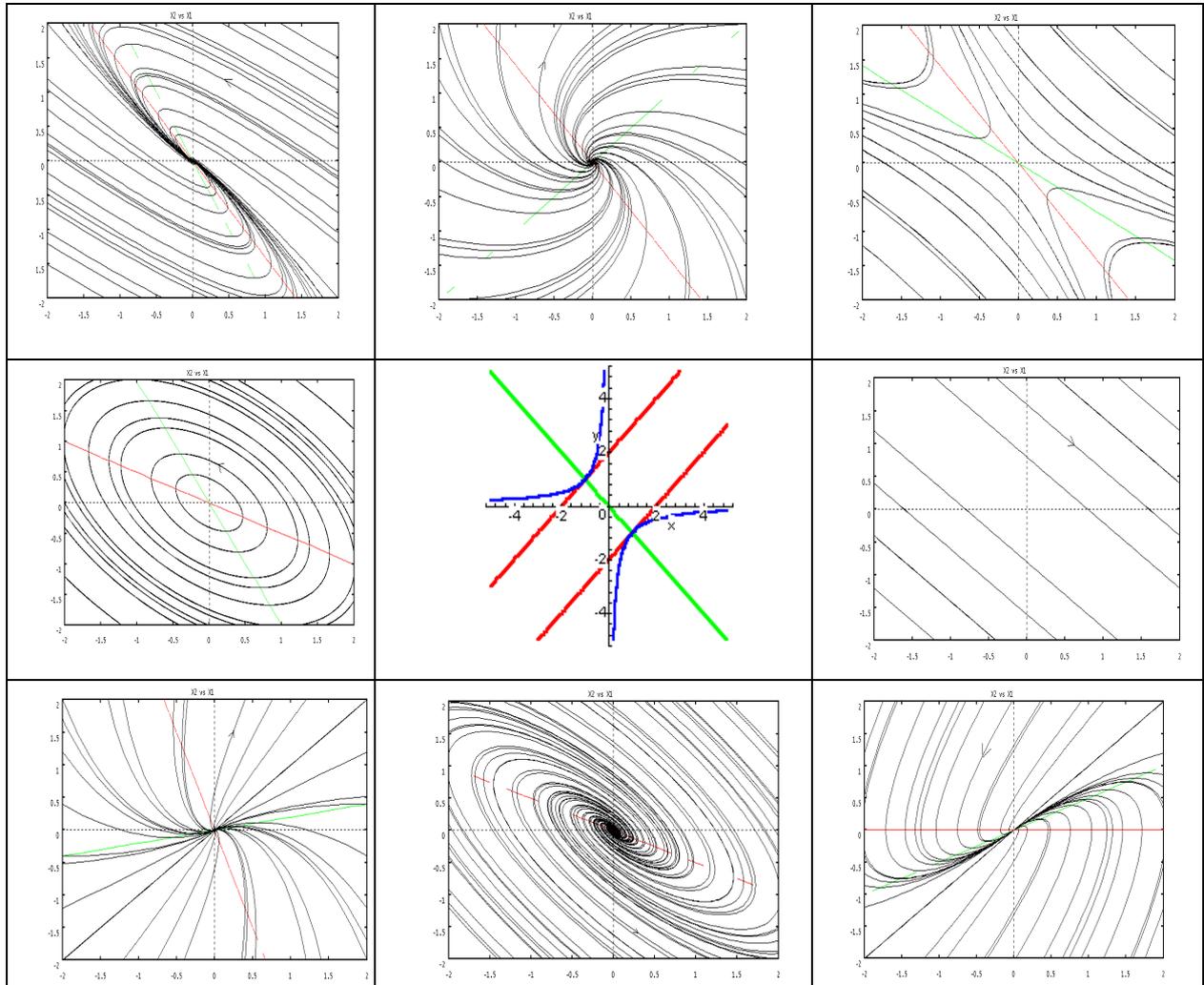


Fig.nr.9. Graphical representation of system

Also, the right of equation $d : s + \beta = 0$ (green) we have $\Delta < 0, S = 0, P > 0$, which means that there is nehiperbolic balance point, center, the system considered accepting periodic solution.

For 2010, we obtain the following results:

$$Y(2) = 196.9565956037391748777;$$

$$R(2) = 10.45535207781.$$

For 2011, we obtain the following results:

$$Y(3) = 227.92627957692094;$$

$$R(3) = 12.361876360940.$$

For 2012, we obtain the following results:

$$Y(7) = 312.35091653164;$$

$$R(7) = 21.923426204478.$$

3. CONCLUSIONS

Prospects for control are numerous and creative management is reflected in particular in increasing the economic performance of companies that provides a stable and competitive Benefits socio-economic motivation of all actors involved in the work. Thus, when failures outlined above, require a series of measures, including: forecasting and business planning for current management to eliminate hidden costs and reducing time not worked, taking measures to attract customers through a better information on their you have to pay fees and program with them, defining clearly the duties, responsibilities and powers of each member of the team, improving management and communication devices to employees, increase service quality, customer satisfaction tracking, improved work and safety activities, etc.

Using multiple regression, has the advantage of a very well-developed mathematical apparatus, studying both the existence and stability of equilibrium solutions as an unstable solution can not be observed in reality.

Regarding the use of dynamic modeling as a new technique for forecasting, we consider that it has the advantage of very well-developed mathematical apparatus, studying both the existence and stability of equilibrium solutions as an unstable solution can not be observed in reality.

Research practical efficiency of this procedure we were inspired by English adage "Time is money" with such a use by users of financial benefits, this procedure that is affected by the user to shorten the time to understand the economic and financial situation his client and obtaining useful forecasts.

Another advantage, equally important is the fact that this method of modeling dynamic helps us to identify issues or regular cyclical economic entity and thus the time horizon to which it relates.

Disadvantages arising from the possible risk of detection of possible errors in recording. Basically, this is not that we can assign its own disadvantage of this method because the first calculation of financial indicators is liable to the same risk, and on the other hand, this risk is further removed by using other forecasting procedures .

Balancing related issues, we conclude that the benefits outweigh the possible disadvantages of using this method, which encourages us to consider using this new procedure, being convinced that the best results are obtained in a short time.

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