

ENTROPIC SHOCKS IN THE SUSTAINABLE DEVELOPMENT OF A COMPANY*

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Rezumat

Proiectul de cercetare își propune să analizeze influența manifestării șocurilor naturale, economice și sociale asupra realizării obiectivelor de dezvoltare sustenabilă la nivel microeconomic.

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Implementarea propunerilor și soluțiilor oferite prin proiectul de cercetare poate conduce la perfecționarea mecanismului de intervenție a statului în economie și sprijinirea mediului de afaceri pentru contracararea efectelor negative ale crizei economico-financiare actuale.

Problematika dezvoltării sustenabile este dezbătută în literatura de specialitate doar tangențial pentru nivelul microeconomic, în raport cu protecția mediului și fără o aprofundare a implicațiilor dezvoltării acestui concept asupra strategiilor, politicilor și tacticilor la nivel de firmă.

De asemenea, problemele legate de impactul șocurilor asupra activității firmelor este abordată tot prin prisma șocurilor din mediul natural. Or, manifestarea crizei economico-financiare actuale a demonstrat că teoria și practica economică nu sunt pregătite cu un instrumentar adecvat de intervenție pentru contracararea unor șocuri, altele decât cele din mediul natural.

Conceptul de entropie este bine dezvoltat în plan teoretic, dar problema corelațiilor și a interferențelor cu dezvoltarea sustenabilă a firmei și șocurile din mediul natural, economic sau social nu sunt abordate încă în teoria și practica economică.

Abstract

The research project aims to analyse the influence of the natural, economic and social shocks on the accomplishment of the objectives of sustainable development at the microeconomic level.

The implementation of the proposals and solutions delivered by the research project may improve the mechanism of state intervention into the economy and may support the business environment to counteract the adverse effects of the present economic and financial crisis.

The topic of sustainable development is debated in the literature only tangentially for the microeconomic level, in relation with environmental protection and without in-depth analysis of the implications of the development of this concept on the strategies, policies and tactics at the company level.

The problems related to the impact of shocks on company activity are also approached using the shocks from the natural environment. However, the manifestation of the present economic and financial crisis showed that the economic theory and practice do not have a proper set

of instruments for intervention against shocks other than those from the natural environment.

The concept of entropy is properly developed theoretically, but the problem of the correlations and interferences with the sustainable development of the company and the shocks from the natural, economic and social environment are yet to be approached by the economic theory and practice.

Keywords: sustainable development, economic shocks, entropy, system, economic processes modelling

JEL classification: G32, G34, L21, O12, O44, Q56, Q57

The main conclusions and proposals of the paper approached the following areas: 1. Shocks in the sustainable development of a company; 2. Influences of the current macroeconomic trends on the dimensions of the partnership between the microeconomic and macroeconomic levels – theoretical and practical aspects, evolutions and trends; 3. Company strategy and the features of sustainable development; 4. Shocks and company activity; traits, manifestation and measures of response; 5. Entropy, economic shocks and sustainable company development; 6. Modelling the economic processes under the effects of entropic shocks and within the context of ensuring company sustainability.

1. If in the past, the economic conditions had an overwhelming role in the evolution of man, the other conditions can no longer be ignored today, the economic component remaining, however, the essential factor of the development. The fact that the continuous increase of the population, of the industrial activity, of resources exploitation and of pollution may soon enough deteriorate the conditions of living, imposed the approach of the economic strategies at the company level from the perspective of sustainability.

The sustainable development of the companies under the present conditions can be ensured only if the companies:

- Ensure by their activity a real conservation of the resources and an adequate way of using the resources used in the economic circuit so as the resources can also be used in the future;

- Display a specific growth which, expressed in percentage, is higher than the inflation.

Business rethinking and redesigning is done with the purpose to get good results in the weak areas of the company. The weak spots usually appear in the production costs, quality of products or services, time of response to various signals from the customers or competition.

Business rethinking so the company has sustainable growth must be done by discarding the old manner of work and starting everything from the beginning. This presumes abandoning hypotheses such as: work division, advantages of mass production, hierarchic control, etc., i.e. giving up tradition and starting on a new road.

The principles of business organisation proposed by Adam Smith, with the subsequent improvements, no longer work because nothing is now constant or predictable and because of the unprecedented use of IT in company activity and because of economy globalization. It is almost unanimously acknowledged that currently there are three forces working separately or together: the customers, which became exigent and offensive; the fierce competition between companies on the global market; the continuous changes.

The three above forces and the effects of their action presume a new way of managerial action and a new way of doing business. This way of action must be flexible and able to give a swift answer to the emerging problems. The companies must be able to innovate and to give up the rigid structures in which organisation relied on separate operations. The managers must organise the activity of their companies "process-based". The process, by definition, is a succession of states, stages and phases which the objects and phenomena go through in their temporal development.

The notion of process is difficult to understand by many people, the managers of many commercial companies included. The managers are used to focus on activities, functions, people, products, clients etc., and less on processes. Hence a conservatory manner of thinking in doing business and less availability to make changes in the organisations they head.

The process-based organisation of company activity takes into account the fact that the initial conditions of the process may change, within certain limits, during the process.

Today, under the conditions in which the change is permanent and the shocks and crises no longer frighten anybody, making changes in company organisation is an objective necessity. The solution for company adaptation to the new conditions of the 21st century is giving up the traditional way of organisation used in the 20th century and shifting to process-based organisation and to using new paradigms.

2. We must not overlook that the company acts within a broader context, within the socio-economic environment to which it belongs. The research developed within this context in the following directions:

- Characterisation of the economic environment in terms of the general objectives for company development;
- Finding solutions for managerial reorientation towards sustainable microeconomic development;
- Identifying the macroeconomic administrative needs for the general sustainable development – analysis to evaluate the position of the company in terms of sustainable development;
- Defining the microeconomic as imperative for the macroeconomic sustainability.

The paper started from the premises that the economic and social development at the macroeconomic level must be the result of the perfect collaboration between the macroeconomic administrative system – the coordinating factor, and the system of the real economy – the driving factor. The two systems have the following roles: a. the macroeconomic administrative system – sets the strategy and the plans of action starting from the general needs for future development of the society and considering the resources specific to the real economy as well as the provisional aspects; b. the system of the real economy – having the general framework for development represented by the strategy set by the macroeconomic administrative system and by the legislative framework, starting from the resources available on the market, provides the support for the development of the society.

Considering the relevant stages of the crisis relevant to the situation in which the administrative capacity of the macroeconomic system is

outrun by the administrative capacity of the real economy (stage in which an administrative void was created implicitly, associated to the difference of administrative capacity between the necessary and the existing capacity), the microeconomic management should have an approach which to ensure the following fundamental aspects for the proper operation of the company:

- A very good balance, in managing the company, between the principles of prudence and profitability, particularly considering the main features of the business environment (risky, unstable, low predictability);
- A sufficiently good level of stability by promoting the proper approach;
- Accumulation of resources needed to go past this stage and for the sustainable development of the company during the resettling period, using an efficient and efficacious formula of the relations between the macroeconomic administrative system (as coordinating factor of the economic and social life) and the system of the real economy (as driving factor of the economic and social life).

The in-depth analysis showed that the microeconomic management must be approached in a more nuanced manner than previously by approaching the needs of resources for the entire period that includes the moment of the entropic shock, with the following elements: sustainable dimensioning of the obligations; risk management; avoiding the limit-situations; using the opportunities.

The microeconomic management must be aware of the necessity to cumulate several aspects which are essential for the proper development of the society, as follows:

- Understanding the concept according to which the economic activity is not a purpose per se, rather a support for the development of the society (absurdly speaking, probably that nobody would run economic activities any more if society could develop in another manner too);
- Seeing things as shown above, the economic activity must also be understood, by both sides, as requiring a perfect partnership between the macroeconomic administration which must assume the role of coordinator of society development and the microeconomic

management, which must assume the role of driving force for society development;

- Both partners should understand the necessity to maintain a perfect balance which to provide the resources required for the development of the society.

It is essential that the microeconomic management participates in this partnership while ensuring a maximum of resources and eliminating any risk of destabilization of the balance needed for the development of the society (whilst the macroeconomic administrative partner should provide the necessary facilities).

In the acceptance, from the current existence of long-term high risks of destabilisation, at the international macroeconomic level, to the ideal state presented above as solution for solving the current situation, we need to consider changing the mentality, at least at the economic level and at least in the environments mentioned in the paper. Such change is as difficult as it is important, especially because several areas of the economic-social activities must be activated towards the accomplishment of the general goal of sustainability, which makes this solution to remain, for a good deal of time, just a theoretical solution or, in the best situation, a goal.

3. The sustainable development of the company can only be accomplished if the strategic aspects are considered. The adaptation of company's strategy to the principles of the sustainable development is a complex process requiring more than the mere enunciation of simple intentions or concerns in this direction. The transformations of the global economy impose both the modification of company strategies and the way in which these strategies are developed. The traditional system of company management still is largely inadequate, given the way in which the economic activity functions and develops presently. This can be seen also from the fact that the business patterns of most companies do not consider the principles and essence of the concept of sustainable development, considering only the short-term objectives of the company.

Sustainable development is a fluid concept which changes in time in response to the higher volume of information and to the priorities of the society. Under these circumstances, the role of the business environment in the sustainable development is still to be clearly defined.

The capacity of the enterprises to contribute to the accomplishment of this desiderate varies with the area and industry in which it operates, with its type and dimension.

The time horizon appears as an element which needs to be taken into consideration when analysing the relation between the company strategy and the principles of sustainable development. The way in which the results of company activity are calculated (calculated presently according to the economic efficiency) is a second element which needs to be considered. The global orientation of the company is the third element that has to be taken into consideration in analysing the relation between the company strategy and the principles of sustainable development. An additional level of difficulty is introduced by the fact that it is not enough to find local solutions to these problems – they have to be integrated at the global level.

We must not neglect another important aspect: the unilateral integration of sustainable development practices by a single company on the market, may not only fail to improve its stand on the market, but may even weaken its competitive position. The use of technologies, for instance, which to decrease the resources used by the company for its activities may be a short-term disadvantage if the competitors don't do the same thing.

The application of the principles specific to the orientation towards sustainable development may require reconsidering contradictory principles underlying the activity of many companies. For instance, the planned obsolescence must also be considered when analysing and adapting the company strategy in agreement with the principles of sustainable development.

A fundamental contradiction must be approached when adapting the company strategy to the characteristics of the sustainable development: company strategies have a rather short horizon, while sustainable development has a long or very long horizon. As potential solution, the adjustment of the time horizon of the companies, at least in terms of resource utilisation, may be done by increasing the role of the different categories of stakeholders whose interests are insufficiently taken into consideration presently. This presumes including these stakeholders, at least for consulting, in the process of strategy development, which

already leads to the idea of the basic change of the way in which most companies operate presently.

We may consider that the traditional system of company management is largely inadequate, given the way in which the economic activity functions and develops these days. The adaptation of the strategy to the principles of sustainable development may seem more as a way to promote the company image, to improve its reputation. If such advantages are the objectives of company management, then the effort of sustainable development will be maintained only up to the level at which these advantages are obtained. To control this dangerous situation, company management must become aware strongly and deeply of the necessity for sustainable development and of the problems that may occur if it is ignored.

4. The financial state of the company shows the fiscal situation of the company at a particular moment. Maintaining the company in a proper financial state presumes a permanent adaptation of the company management in order to compensate for the changes in the socio-economic environment which affect the way in which the company runs. Failing to take these changes into consideration and the absence of adequate instruments of management compromise the proper financial state of the company.

A difficult situation is characterised by a serious, important and progressive absence of control over the obstacles and difficulties caused, on the one hand, by the incapacity of the managers to run efficiently the company and, on the other hand, by the economic development of the company. It is not the nature of the difficulties, but their frequency and intensity, which are determining in characterising such situation.

Leaving from this reality of the economic activity, the company managers must be aware of the necessity for an as accurate as possible diagnosis (evaluation) of the current company operation, in order to answer to questions such as: is the company in difficulty, is it in crisis, and how deep is it?

The **shock** is an unexpected or unpredictable event, either positive, or negative, affecting an economy. Technically, it refers to a change in the exogenous factors – factors not accounted by the economy – which may impact on the endogenous economic variables. In an economic

model, an exogenous change comes from outside the model and it is not explained by the model.

Generally, the **shock** is an event (political, economic, ecologic etc.) conveyed in a given environment, whose path modifies the functioning of the environment. The environment in which the shock is propagated may be a particular segment of the national economy (a branch or sub-branch of the national economy, a particular category of companies etc.), or may be a country or region. The path of the shock is determined by the characteristics of the environment in which it propagates.

The specialists consider that a **shock situation** due to an organisational crisis may be avoided if the organisation runs a self-evaluation of its vulnerability to crisis solutions.

At the company level, a critical situation can be generated by internal, endogenous causes or by external, exogenous causes. The external causes, usually unpredictable, are various: adverse market conjunctures; catastrophes, floods, earthquakes, epidemics, conventional or unconventional wars etc.; legislative and possibly institutional changes that may affect the domain of activity of the company; hostile campaigns against the company in various communication media; hostile take-over, mergers or other procedures.

The **manifestation of the shock at the company level** is fast, its effects and consequences being perceived immediately. Financial losses, the loss of image, market position etc., of the company can be major or minor, depending on the state of company preparedness to act in such situations. In many cases the companies could not resist to the difficult situations which confronted them and leaved the market either by bankruptcy or by voluntary closedown. The international practice in this field reports two types if possible manifestations: **reactive attitude** and **pro-active attitude**. A mix of the two attitudes may be preferable.

In order to manage efficiently the shock, the company must first admit the possible occurrence of such state and then it must develop a system for the efficient management of the crisis. Just like any responsible firm created a risk management system, a system for shock management must also be developed. Shock management presumes two basic steps: prevention and correction.

The relation between the shock and the financial state of the company is very complex and the basic factors of influence are: area of activity; type of financing; level of financing risk diversification; predictability of the economic environment; related regulatory framework, reaction of the central and local administration.

The shock affects directly the financial activity of the firm. Thus, in order to minimize the effects, the agent “opposes resistance” with the help of “stabilizers” (endogenous factors pertaining to the enterprise). This process of opposing resistance is called **adaptation to shocks** and it shows the capacity of the company to adjust to the new situation, to implement preventive measures (if the shock didn't occur yet) or measures of remediation (subsequent to the shock).

In pursuit of its basic goal of continual operation, the company will have to develop on a permanent basis, making performance. On the background of its development, the enterprise becomes vulnerable and is confronted with a paradox: its manner and style of management are, in a new stage of development, factors hindering the growth, factors which affect company efficiency and profitability and which may cause bankruptcy.

Using as sources of information the financial statements currently produced by a company, the events which can anticipate the failure may be grouped in three categories: 1) readily identifiable events; 2) hardly identifiable events; 3) unpredictable events.

Previously to closing the synthesis financial statements, there are some “alarm signals” which draw attention to some aspects whose thorough analysis may reveal the stage of depreciation in order to take the appropriate measures. These “alarm signals” can be detected in the main activities of the company, at the **financial level** included: a) decrease of the value of indicators; b) increased level of indebtedness.

The financial situation of the company will be revealed by indicators showing the strategic orientation of the company, which characterise its internal and external relations, which how efficient is the adaptation of the company to market requirements.

The shock changes the evolution of the economic-financial indicators because the effects are felt mainly, on the short-term, on the structure of

the income, production, debts and expenditures by including the externalities.

In coping with the possible difficulties, the company managers will have to adopt a management style with fast and pragmatic actions, they will have to show their ability to solve the operational problems and their aptitude to react swiftly to the changes, many times unforeseen, in the environment.

Given the conditions imposed by the market economy, the economic and financial strategy of the company must focus on *profitability* and on the *liquidities* necessary for a continuous operation. If the company is properly adapted to the current context and has acceptable performance, the strategies for the future context presume a “transformation” or “reorientation” of company activity. If the company is not adapted to the current context, having bad performance, and to the future context too, a strategy for the “revival” or “restoration” of the economic-financial situation is necessary.

The financial difficulties due to the shock may also be seen via two aspects:

- Existence of a financial structure ill-adapted to the nature of activity;
- Financial fragility. The performance of the company doesn't ensure its financing resources.

The economic agent is behaving inertially within an inertial environment. When the environment changes, the economic agent changes its behaviour, becoming vulnerable if it is incompatible with the newly-created system. Therefore, the economic agent must perceive, accept and assimilate correctly the change of its financial component. If it cannot adapt, it will become vulnerable to change.

Measures for company adaptation (flexibility) have to be sought in order to alleviate the risks and to ensure company survival during the periods with a low (maybe negative) level of the monetary flows generated by the entropic shock.

The shock may also have a positive impact on the company, determining its **reinvention** by the change of mentality regarding the field of activity, goals, customers, suppliers etc.

The shock has adverse effects on the financial results of the company, which are reflected in the economic-financial indicators: the

level of elasticity, the level of equipment utilization, the level of debt sensitiveness, and by the classical indicators: treasurer, profitability, cash-flow etc.

The company must adapt to the newly-created situation by investments, new technologies, implicitly by taking new credits, maybe subsidies, mergers (when appropriate). In order to decrease the impact of the shock, the economic agent seeks absorbents (exogenous to the company) and stabilizers (endogenous) to be used in its operation.

5. The entropic shock is a special case of shock. Between entropy and development, the evolution of any kind is an apparent contradiction. After multiple attempts to transgress the second principle of thermodynamics, the scientists concluded that in order to separate the order from disorder, entropy must decrease. None of these attempts actually managed to go past the second principle, which remains one of the greatest constraints of the real world. N.G. Roegen came with an interesting proposal, recommending the entropic *storms*. A company, X, might use the production processes of another company, Z, provided that these processes produce (unused) entropy in significant amounts. In this particular case, entropy might decrease for company X, but overall, the total entropy is higher than in the beginning.

The reality cannot be dissociated from any increase of entropy. The principle of the entropic undetermination, the modern formulation of the second principle, leaves a lot of degrees of spatial-temporal freedom of the (irreversible) processes, favouring the emergence of the new following a very large amount of combinations (changes). The principle (law) of entropy claims that every combination (change of the present) must be accompanied by an increase of entropy, while not showing the way in which these combinations take place. Anyhow, one cannot act directly in any way on the entropy, only on the cause of entropy) the activity of the systems and the conditions determining them (resources, energy and experience).

The production of entropy is an abstract notion and it is hard to quantify and calculate. It is directly related to the level of transformation (capacity, competency of an entrepreneur). If the level of transformation is very high and if the useful activity has a high yield, one may say that the production of entropy is rather low, therefore rational. However, if the

useful activity has a low yield, the production of entropy will be high and the entrepreneur will dissipate usefully a lot of resources, energy and experience.

The entropy in economy must be analysed as marginal entropy, with noticeable increases from a period to another, from a process to another, the total entropy of a system being impossible to define and quantify.

The ideal situation would be the discrete increases of entropy from one period to another. Although the increases are not major, the principle of turning is observed, a sustainable turning which respects the natural environment by a rational use of resources and energy.

The natural resources support all the economic activities, but they are exhaustible. This is worrying because once exhausted, any economic activity will be quasi impossible. A situation is possible which theory can only solve by an adjustment. If the place of the consumable resources would be taken by the experience of the human nature, in future this situation might be a solution. But this is just an adjustment, which only time will support or not. The change of company organisation, including due to external shocks, cannot be analysed using the concept of entropy in its classical meaning.

In chapter six of the paper we proposed to build an entropic model that may analyse and monitor the discontinuous phenomena, particularly from the external environment of the company. We will also propose another way of analysis starting from the organisational structure of a company and from the shocks which take effect on the level of company organisation.

A. The proposal is to measure the production of entropy as marginal entropy, with noticeable differences from one moment to another. We will only obtain an indicator, a sign that the production of entropy is not zero. Summing up these indicators is meaningless, and so is the total entropy of a system.

The most important aspect of entropy is the fact that it enunciates the principle of turning in any context: any irreversible process, present in an (economic) system, producing entropy, will create a new state, in that system. The only logic of the evolution of the irreversible processes is given by entropy. **Thus, the irreversible processes can be controlled**

through entropy. This control refers to the identification in good time of the following elements:

- Finality of the irreversible process or discontinuity, when entropy tends towards zero or close values. Even if they have a finality, the irreversible processes cannot be resumed with the same logic of the initial run, hence they are unique;
- The clear and sure evolution of the irreversible process when entropy increases discretely;
- The clear and sure evolution of the irreversible process when entropy increases very much.

The purpose of this research is to explore and describe those phenomena from the business environment which are hard to control or which even avoid control, their correlation with irreversible phenomena from the thermodynamic physics and setting relations and corrections between these phenomena of influence and the global activity of the company. All these dimensions, relations and correlations allowed building a model, the *entropic model of analysis*.

The entropic model relies on the following premises:

- The **material and energy resources of the entrepreneur are transformed into useful activity at the expense of some losses**. The witness of the loss is the entropy. This process must be irreversible. The material resources are the **hot source** of the irreversible process.

- The **discontinuities from the business environment influence the above process by the fact that they can couple to it**. Any such couple represent an action on the hot source and on the level of transformation in useful activity, which will cause increases or decreases of entropy.

- **Not all activities need to be monitored**. The useful activity from premises (1) needs to be determined function of the financial, management-marketing, social responsibility, etc. objectives.

- **The first premises and its efficient activity must be compulsory related to a cold source, which will be external to the organisation**. The location of the cold source within the organisation compromises premises (1) and the monitoring of the model. For instance, for the marketing department, the cold source is represented by the clients, while for the human resources, by the employees etc.

- The decrease of entropy below the balance level is a critical aspect for the organisation, which calls for immediate analysis.

The order of the critical aspects is the following: 1. Disappearance of the cold source; 2. Disappearance of the hot source; 3. Coupling of the discontinuities to the first premises.

There may be situations in which a discontinuity is more serious than the disappearance of the hot source, but never more serious than the disappearance of the cold source.

The equation of the basic process of the model is:

Hot source = useful activity + losses (entropic factor) (1)

Presumably, the level of transformation and the useful activity are two compatible notions (such as are energy, heat and mechanical work from thermodynamics), but not reversible: the level of transformation must be related to the useful activity only in this direction, not in the reverse one too. Under these circumstances one may say that **not the entire amount of energy is transformed into useful activity, meaning that the level of transformation is incomplete**. In other words, that the level of resources and energy transformation into useful economic activity is not maximum and that there is dissipation.

The logic demands that this model is positioned within the strategic planning of the company. If the planning is not done for the first time, it is recommended to use the model according to SWOT stages and according to market overview. If planning is done for the first time, it must be known that in any business environment, particularly in one from an emergent economy, there is at least one set of factors which are anti-entropic. The political, economic, social and natural environment, as well as the competition, the clients or the suppliers etc., generate a complex category of anti-entropic factors. Under these circumstances, the volume of information that may be submitted to analysis is huge, a quantification or simplification of the things, although recommendable, being very difficult.

The success of this endeavour depends on the correct quantification of the entropy and on the coherent, **real time** identification of the unwanted couplings: anti-entropic factors with activities which produce entropy. We propose the quantification of entropy in an indirect manner of the level of transformation of resources and then of the efficient

activity. The difference between these two quantifications will be the volume of the loss during the process which, as seen, may be related to the **production of entropy**.

Obviously, this equation is too simple and apparently inexplicable, first because it is hard to define a level of transformation and a useful activity expressed in absolute size. Furthermore, this cannot be done for the simple reason of avoiding the summation and sub-summation that might be affected by errors.

The stages of quantification might be the following:

1. **Matrix definition.** Two matrices will be defined: a. A matrix of the level of transformation and, b. A matrix of the useful activity, consisting of all the elements of influence.

2. **Determination of the cardinal base of each matrix.** The essence of the variables level of transformation and useful activity will be defined.

3. **Difference of the potentialities.** The differences of these cardinal bases may be interpreted as the difference between the potentialities of the two matrices. Furthermore, these differences will be interpreted statistically.

The dynamics of the entropic model consists in its operationalism, which, in turn, consists in the capacity of the model to record in the two matrices variables, sensitive and discrete in time, of the potentiality of the elements or phenomena of influence.

The entropic model of analysis shows in real time if the organisation loses its market identity due to the interaction with the discontinuities from the business environment.

The advantages of this model can be the following: - **real time** placement on the same level of the threats and opportunities (already valorised), of the strengths and weaknesses of the organisation; - real time indication of the place where disturbances occur (from a threat or discontinuity); - stabilisation and support of the PSM process by monitoring the processes of valorising the (entropic) opportunities, which helps accomplishing the marketing objectives.

In the case of confirmation the model has certain limits: - lower level of applicability for the firms evolving in a static environment or for the firms which can control a large number of discontinuities; - under the

conditions of a stressing globalization, which wipes out the cultural differences between the individuals, the model is useless; - the model just warns, the solutions to the problems being developed by the managers; - the model offers no strategies.

B. The entropic shock affects directly the level of company organisation. In order to alleviate as much as possible the shocks of the disaster, the agent “opposes resistance” with the help of “stabilizers” (endogenous factors belonging to the company). This process of opposing resistance may be called adaptation to shocks, characteristic mentioned previously in the paper.

The types of stabilizers depend on the nature and state of the economic agent. If the company has a proper material and human potential and if the management is very well trained and able to cope with the emerging problems, its state will not change significantly.

The adaptation to shocks and the used stabilizers depend primarily on the interface with the external environment, the quality and level of its activity being primordial for the survival of the company, which is considered to be an open system. The entropic shocks are detected first by the interface of the company with the surrounding environment. Within the context of the open systems, the interface makes transfers of matter, energy and information between the environment and the company components, playing a role similar to that of the cell membrane. Within the context of this paper, this “membrane” represents the totality of the means, instruments, techniques, mechanisms and procedures by which the company may accomplish a transfer of material resources, work force, energy or information with the surrounding environment.

Any “membrane” defined in this way must be enough permeable to allow the exchange from and to the surrounding environment, but only within given limits. This presumes: - at least a flow of transfer; - at least a channel of transfer; - at least an “external” receiver **re** which to be part of the interface (membrane) of the receiving entity and which has direct link to the transfer channel; - at least an internal receiver **ri** which to be part of the interface (membrane) of the receiving entity and which has direct link to the internal environment of the company; - at least an “external” transmitter **ee** which to be part of the interface (membrane) of the transmitting entity and which has direct link to the transfer channel; - at

least an internal transmitter e_i which to be part of the interface (membrane) of the transmitting entity and which has direct link to the internal environment of the transmitting company. The transfer flow is continuous or periodical and it has specific amplitude.

The transfer channel may be potential or active. It is activated when a flow is transmitted at one of the two ends of the channel, while a receiver of the interface accepts this flow at the other end (material, energy or information flow).

The transfer within the interface between $\{re\}$ and $\{ri\}$ is done under specific conditions:

- A cost for the processing of the flow of materials, energy or information;
- Losses during the transmission of the flow towards the internal environment.

An external receiver re can transfer matter, energy or information to a specific internal receiver ri or to a sub-multitude of $\{ri\}$, function of a pre-set algorithm of transfer.

Permeability is a basic property of the interface which allows the transfer of the flows from the transmission channel towards the internal environment of the company.

It is obvious that permeability is null in the case of the closed systems, but can we say that permeability tends towards the maximum in the open systems? We don't think so, because the interface, by its organisation and functioning, doesn't allow the maximization of permeability.

If permeability would be maximal, we have two extreme cases:

- The properties of the company would end identical with those of the transmitting entities;
- The internal structure of the company is destroyed and it disappears as receiving entity.

In both cases, no transfer is done and the referential for permeability disappears.

Generally, permeability, P , depends on the cost for the acceptance of a transfer flow of a particular frequency, the cost of accepting acceptance of a transfer flow I (I is the type of flow) of a particular amplitude, the "technological" cost for building or maintaining the architecture of the interface, the cost for ensuring the pre-set level of organisation of the

interface, the cost for ensuring a pre-set capacity of absorption of the internal environment of the company.

For company survival it is important that the internal organisation of the interface allows a transfer so that it ensures the operation of the company within the set parameters, according to the adopted strategy, plans and tactics.

The entropic shock may appear when:

- The transfer flow exceeds the capacity of the transfer channel; in this case the blockage can be transformed into shock for the transmitter;
- The transfer flow exceeds the capacity of reception of the receiver;
- The transfer flow changes or is stopped during the transfer, because of the transmitter or because the properties of the transmission channel change;
- The transfer flow is blocked within the interface, even though it is useful for the internal environment of the company;
- The transfer flow passed the interface and blocks the organisation of the internal environment of the company.

From the point of view of the company, the entropic shocks appear when the transfer flows exceed some limits pre-set by the receiving entity, impacting on its level of organisation. Organisation must be seen under two aspects: **internal organisation of the company**, in general and **internal organisation of the interface**. Usually, it is omitted the fact that an interface is organised in a specific way, that it includes elements, relations, actions, processes and mechanisms, being even managed; all these aspects are perceived more or less depending on the dimensions of the interface and of the company.

In this view, the entropic shocks once appeared on the interface, may be transferred to the internal environment of the company or may be stopped within the interface (the organisation of the interface changes); if the shock flow goes on, the actual internal organisation of the company may change.

The passage of an entropic shock through all these “stages” – transmitter, channel of transmission, initial receiver of the company, processing within the interface, transfer towards the internal environment of the company and change of organisation – cause the entropic shock

“quality” to erode. This erosion, if achieved within an adequate time interval, may be beneficial to the receiving entity by a proper adaptation.

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