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**FACTORS INFLUENCING AN ENTERPRISE DYNAMICS
IN THE CONDITIONS OF ITS PARTICIPATING TO THE
DEVELOPMENT OF MILITARY CAPABILITIES**

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Abstract:

The company, as a participative part active in the market economy, has as main goal making profit. In the case of company connection to the military area, many of the competition rules acquire new accents that are not in its main activity in the market. It is possible that some of the company's objectives, even its strategy on different time horizons, may acquire new meanings that were not originally anticipated. For this reason it is good to know in-depth the relevant variables that determine a stable and sustainable dynamic of the company in terms of contact and integration in the process of implementation, operation and demobilization of military capabilities.

Key words: capabilities, dynamic models, outputs, inputs

1. Introduction

Developing military capabilities involves a highly complex process, given the nature of the process itself and the dynamics of development. Research, planning, the development itself, the use, recovery and ultimately the demobilization of the military capability involves bringing together the elements of competent military authority and of the market economy players, whether state owned or private.

Even if the picture is extremely complicated, sometimes with gray or dark areas due to socio-economic and political realities specific to the contemporary world, we can try to model the dynamics of companies that contribute, in varying degrees and in different phases, to achievement of military capabilities.

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2. Variables determining company dynamics

If we appeal to the theory of economic cybernetics, the company can be seen as a complex dynamical system in Kalman sense. This approach allows the identification of all elements of the triad input - status - output. They correspond to the inflows (decision or control variables), the system dynamics (state variables) and output flows (outcome variables). In this way, for each firm involved in the development, operation and demobilization of military capabilities, different models known in economic cybernetics and economic dynamics may be applied, to determine their evolution over different time horizons. Also, we may follow the more accurately the characteristics of the evolution, such as the optimal trajectories and the conditions where that development is possible, taking into account the influence of environmental factors, their dynamics over time and the related expectations.

This approach requires the use of a dedicated mathematical apparatus (introducing the functional goal) by which we may determine the company or group of companies the performance as a dynamic system along trajectories of evolution generated by dynamic equations and restrictions of the following nature:

- political, through national and international legislation or lobbying related to taxes and subsidies on goods and services that the company provides for the generation of military capabilities;
- economic (regarding the resource allocation), the predictions made on input variables which can not be controlled by the company: input and output prices – resulting from the banking (lending rate), capital markets (equity prices), exchange market (exchange rates), changes in domestic and export demand for the business' products and which can have a major influence on the processes in the domain of military capabilities.

In Figure 1 is outlined the business interactions with key interest groups within it and beyond. Company dynamics and therefore the optimal development of the company is subject to all interactions between the various interest groups, reflected in the dynamic models through the objective function, in the restrictions or in the structure of the dynamic equations when we conceptually divide the economic and sociological models when we make reference to items related to other aspects (policy, diplomacy, etc.).

In the beginning we shall address the internal elements of the company: management, employees and technological structure. These elements are themselves complex systems that can be discussed separately, but in this paper I will treat them as well-defined entities.

1. **Company management** is done by the management board, which may include the Chief Executive Officer, Chief Financial Officer, Chief Operational Officer, Chief Technological Officer. They are not the owners of the company, but they participate operationally in decision making with the aim of the company development, improving the company reputation, maintaining the company's market value, reducing the likelihood of acquisition by competitors or the business bankruptcy. As objective function we may use the maximization of the development rate (infinite horizon) expressed as the discounted value of the turnover, with the restriction of providing a minimum level of dividends to the shareholders or maintaining a minimum level of earnings per share. This objective highlights the consistency of action between the operational management (managers) and

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shareholders strategy. Delegating the management competencies towards managers is done by limiting their range of action through:

- limited ability to perform company expansion-related investments by setting the restriction of an upper limit to the capital growth rate of;
- planning the production capacity based on the available personnel and the personnel training rate, as well as depending on the assets adjustment costs.

A special discussion may be developed depending on the type of ownership - company is private or state-owned, generating a specific set of management skills.

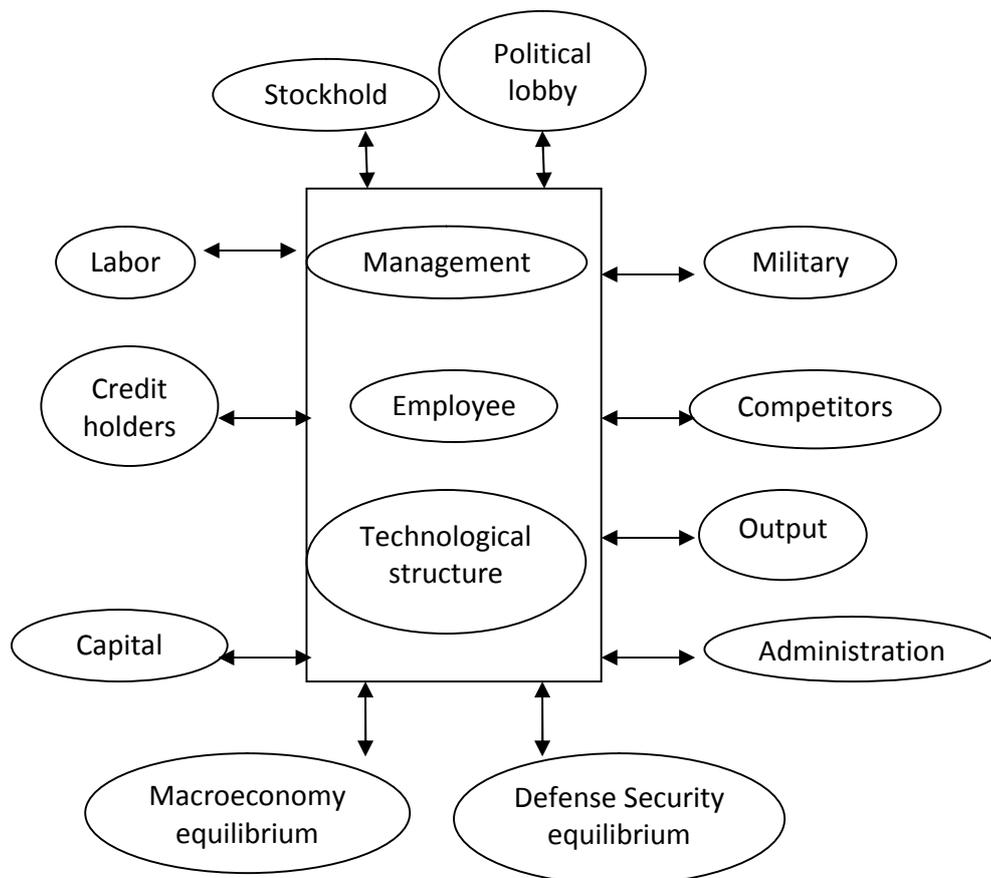


Figure 1

2. **Employees** have a dual role in any variant for the company's organization. First of all, they are one of the most important factors of production, known by specifying the production function. Secondly, the employees are directly or indirectly a decision making factor, though the trade union power.

The implications of this approach are specified in dynamic models either by restricting the rate of dismissal or by the functional objective of maximizing the discounted income flow for each employee. There are also different approaches regarding the organizational form of property, public or private.

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3. **The technological structure** is relevant for the dynamic model of the firm in terms of the degree of replacement of old equipment with new one, being the drive belt of technical progress. The effect of the technical progress is highlighted in the model by the operating unit costs which show that newer generations machines operate at a lower cost than the older ones.

The internal structure of the firm can be enhanced with other relevant elements, but those which were mentioned are the most relevant, by themselves and their role, through the variables describing their quantitative and qualitative influence on the firm dynamics. The company's external elements are described as follows.

4. **The labor market** is a complex of elements with a highly dynamic evolution, characterized by a multitude of features. The company is heavily influenced by its geographical position both by what is happening on the labor market and by its own employees. However, it is important to detect the relevant variables that affect the firm's dynamics in relation to the labor market. Thus, under conditions of perfect competition in the labor market, the company's marginal labor productivity must be equal to the real wage rate imposed on the labor market. In monopsony conditions relative to the labor factor of production, the firm decides on the nominal wage rate and the employment or dismissal rate. Of course, each of the variables stated above are based on another set of relevant measurable variables. Also, as I have mentioned relative to the company's employees, particular cases of ownership of the company, public or private, may be discussed.

5. **Creditors** are a group which supports the company's external interests, but do not participate directly to its management. They impose their interests through lending conditions in order to minimize the risk related to loans recovery and interests, as services related to the debt owed to them by the beneficiary company.

In dynamic models of the firm, these conditions are introduced through:

- the interest rate;
- the maximum limit imposed on credits, limits depending on: investment expenditures, the social capital, the cash flow.

The interest rate can be considered constant, based on naive expectations or introduces through anticipatory mechanisms: adaptive forecasts, rational forecasts, etc.. The maximum credit limit imposed can not be exceeded, otherwise the company would move to another risk category, but there are approaches in which the company's risk profile changes over time.

6. **Capital goods market** (providers of assets) is introduced into the dynamic models of firm through the characteristics of this market and takes into account the perfect or imperfect competition. The analysis of this element is performed in competitive market conditions. For the firm's dynamics, the implications of this approach are reflected in the cost of capital, which shows that its structure depends on:

- the technical depreciation rate, considered in its simplest form, as the rate of recovery;
- the interest rate for investments loans, which reflects the connection with the financial market;
- the inflation rate.

In addition we may consider also the impact of the technical progress, with effects on the average life cycle of the capital goods. Both in perfect and imperfect capital goods

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market conditions, achieving the optimal scale of production capacities generates inherent cost related to the adjustment mechanisms, grouped into two categories:

- Exogenous adjustment costs, through the firm's demand for investments (which is endogenous);
- Internal adjustment costs, imposed by correlations with the size of short-term inputs such as labor, energy, raw materials, etc..

The effect of the characteristics of this market can be characterized by showing the marginal growth rate of these costs.

Another relevant feature that can influence the company's dynamics and which has to be taken into consideration is the technical progress, incorporated or not into the capital goods, with effect on the equipment replacement policy. These interactions reflect the close connections with the company's technological structure.

7. **Shareholders** are considered as dominant makers, by their organization in the Annual General Meeting. Their objective is to maximize the firm's value, defined as the discounted value of the flow of dividends or the current value of cash flow for an infinite time horizon. In case of a finite horizon, the functional objective will include the final component which, in the long term, evaluates whether the shareholders objectives for the predetermined time horizon has been reached. In order to achieve consistent and realistic dynamic models it is very important to specify the form of the functional objective. Recent studies have shown that there is a strong focus on the impact of the shareholders group structure change, as well as of the situations in which new shares are issued on firm dynamics.

8. **Political lobbying** is not usually discussed in the economic studies and works. One reason is that it is a variable very difficult to define, it is quite elusive, but at the same time it represents the interests of a privileged group of people who have access to very high level decision areas. Especially in case of military capabilities development, this political lobbying can strongly influence the firm's dynamics, as it modifies the functioning of the market economy laws. The company may introduce higher risk factors when engaging in providing military capabilities due to the higher volatility of placing the goods and services it produces.

9. **Military agencies**, regardless of their areas of competence, are formidable players in what concerns the production of goods and services in the field of security and defense. They decide legally, under the strong influence of political lobbying and government administration, what is necessary, the quantity and quality of defense resources. These entities often use special laws which often bypass or subjugate the laws of market economy, which increases the risks that can be dynamically shaped company.

10. **Competition** is one of the defining elements of a market economy. It is very important to achieve an accurate substantiation of the dynamic microeconomic models of the firm by identifying the response functions of the company and its competitors. Many specialized studies discuss optimal control models which are developed by expanding marketing models regarding the behavior of competitors. These marketing models influence at their turn the market through pricing and advertising policies. An interesting approach is given by the Kimball model applied to two companies, a situation known as a duopoly. The company's reactions to the competition's policy depend in a crucial way on the completeness of the information held each other:

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- If the information is complete, the reaction will be "open loop control" type, generating its own optimal policy as action program for the time horizon considered;
- If the information is incomplete, the reaction will be of "feedback" type, ie a closed loop reaction.

In relation to the completeness of information, we may continue the analysis using the model Inada, representing the dynamic model under uncertainty.

All the above are also strongly influenced by specific actions of the company in the production of defense goods and services.

11. **The output market** is addressed by the microeconomic theory, consistent with the mechanism of demand - price, considering the company's market position, the existence of perfect or imperfect competition, the monopoly or oligopoly situation. Another approach related to the output market focuses on the company's ability to actively influence its output demand, opportunities related to the company's promotion models, the price policy, the product policy and the distribution policy. Optimal control models shows the optimal strategies aimed at changing the firm's product demand curve, summarized in the advertising expenses. We may use the "diffusion" models, feed-back type models "response sales" reflecting the decreasing effectiveness of advertising expenditures overtime. In the Nerlove and Arrow model, the indirect effect of advertising on sales costs by increasing the "goodwill value" is outlined. However, we must introduce here some restrictions related to the advertizing specific to the security and defense areas. If the political lobby, the military and government agencies require it, the firm must revise the above mentioned policies due to secrecy restrictions related to the multitude of operations, both of economic and military nature.

Another approach may be based on the demand forecasting models, taking into account the fluctuations in the business cycles and in the cycles deriving from the military and government agency documents that are made public or that which the company may have access through security certificates. This approach highlights the impact of these cycles on the investment policy and the personnel policy of the company.

12. **The government administration** influences the business strategy through government tools of fiscal policy nature. The variables that appear in the company's dynamic models are outlined by the taxes the firm must pay, as well as through subsidies and grants to which the firm may have access.

The main factors that characterize the fiscal policy are:

- the tax rate for different categories of taxes: profit tax, tax on capital goods (property), tax on dividends;
- the tax treatment of depreciation and interests on loans;
- the tax facilities for the reinvested profits or laws regarding a special case of accelerated depreciation of capital investment goods from new generation of technical progress.

In regard to the company's subsidies and grants, we can say that they can be included in the dynamic model with a different weight when involved in making military capabilities than when in the normal participation in the market economy with the purpose of producing civilian purpose goods and services.

13. **Macroeconomic conditions** influence the business strategy through the tax system, through interest rates, exchange rates, the average (or the minimum) wage rate, the discount rate, rates generated through dynamic balance, etc.. In a market economy, we

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have to take into consideration also the role of inflation, expressed as the expected inflation dynamics. All this information is derived from dynamic macroeconomic models and the experience of dealing with the military. They are inputs outside the firm's control, having a decisive influence on its optimal development policy through their trends and also through the quality of the anticipation of these trends, considering the long-term goal. Another issue concerns the firm's confidence in the predictions made by the government administration. Introducing inflation in the company's dynamic models is a complex issue and there are models that incorporate the inflation through the price dynamics, the changes in the stock value of the capital goods, making the differentiation between the accounting amount and the actual value induced by inflation, etc. Another dynamic macroeconomic equilibrium factor affecting the firm's growth is the aforementioned cyclical nature, induced by the short, medium or long term trends of the main macroeconomic indicators. Their effects occur with certainty in the company's evolution. Thus, in a period of economic recession, the reduced consumer demand will likely affect the sales volume, leading to stock increases and property losses through asset immobilization. In the opposite direction, economic growth induces at the microeconomic level investment opportunities for the company growth. These influences are illustrated through a dynamic model where investments are measured relative to the macroeconomic growth rate of investments.

14. **The security environment balance** also influences the dynamic model of the firm in a paradoxically opposite way than the macroeconomic factors. If the company will be involved in the development of a military capability, existing conflicts may accelerate its economic success by increasing its output. There are many examples of companies that have thrived and continue to thrive through the interaction with the military sector. Also, the company may also benefit from state of peace achieved at a level of security environment equilibrium caused by a large number of existing military capabilities.

3. Conclusion

The proposed subject of this paper is particularly sensitive. It addresses an area in which the company's evolution doesn't always take place in the spotlight, in many occasions being even classified. Yet by highlighting the company's interactions with the environment in which it evolves leads to a picture of great complexity on the problem of the dynamic models in the company. For researchers and analysts concerned with increasing the performance of companies that contribute to military capabilities development it would be interesting to improve dynamic models in use today, such as: the Hall - Jorgenson model, the Lesourne-Lebane model, the Ludwig model, the Van Hilten model. They may be the starting point for a better understanding of the behavior of the economy in general and in order to foresee events that can lead to crisis.

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