

Considerations on the Development of Political Methods for Absorbing Uncertainty

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Abstract

There is no "standard" method used as a panaceum to reduce decision-making uncertainty. The technocratic approach on management is only valid on a free-competition market, with equal chances for everyone. In practice, this is a utopia. Knowledge-based economy changes the exogenous environment of decision, where the dominant aspects are, for example: data amount sometimes exceeds data-processing capacity, main competitors have the same information sources. A knowledge-based economy has also disadvantages, i.e. lower predictability. In many cases, the most important decisions and actions are not anticipated by an organization's strategies.

Political methods for uncertainty absorption play an important part in defining the socio-economic dimensions of a knowledge-based society. Ever more often, regardless of their size, firms are interested in taking part, either individually or together with other stakeholders (economic or social partners), in activities through which they can control and influence the future events that would impact the firms.

Both vulnerability and opportunity can only be defined as a result of a proper evaluation of the factors involved in the activity of a firm and directly influencing the way in which the operational and organizational optimum is defined.

By methods using fuzzy number to evaluate the quality of various relationships within and outside the organization the knowledge workers can generate solutions based on logical criteria in conditions of high uncertainty.

Keywords: *political methods, uncertainty, attributive variables, evaluate process, fuzzy numbers*

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Introduction

The management of uncertainty has emerged as a focus of research rather recently compared with other specialisations and has become established owing to the efforts of experts in the insurance and financial field. It has been noticed that, in a majority of cases, the applied solutions which managers resorted to in limit situations were well ahead of any theoretical developments due to the unique character and limited degree of generalisation of a decision-making situation.

Many specialists argue that in practice the key decisions and actions do not arise from the strategies developed by the organisation (Yvan Allaire) but are the outcomes of decisions made on the spot, based on rational analysis performed over a very short time. Uncertainty has emerged as a distinct phenomenon, which may be due both to the decision-maker's theoretical errors and to the inaccuracy and incompleteness of available information.

An economic operator's approach to uncertainty is closely linked to the operator's intrinsic features (size, organisational structure, turnover, output, industry, relevance of the activity, etc.) and to the extrinsic features of the environment where it operates (level of development of the region, infrastructure, product market, political and legal framework, etc).

In practice one cannot speak of a "standard" method used as a single recipe that may facilitate the reduction of uncertainty in decision making. Technocratic approaches to management are applicable in most cases only under free market conditions, in which all participants have an equal opportunity to influence their environment and pursue success. This fact is obvious in the context of the ongoing, hard to predict crisis.

Yvan Allaire proposed three main strategic management approaches to uncertainty: i.e. technocratic, structural and political approaches. Technocratic approaches seek to anticipate future conditions by means of quantitative and qualitative models. Structural models focus on defining a structural context that should protect the organisation from fluctuations in the environment and from random factors in the environment. Political methods aim to gain control over the immediate future not so much by economic levers but by policy and legal ones in order to eliminate or absorb uncertainty to a large extent.

A further perspective has been developed by Hofstede who proposes cultural methods of uncertainty avoidance within an organisation and in relations with society, the environment, state institutions, etc. Moreover, under the current circumstances, when many informal activities dominate the political and social sphere, we would also like to highlight methods focused on the strategic redistribution of uncertainty, consisting either in the artificial absorption of uncertainty or in artificially creating it using different levers from those mentioned previously (Alecú).

In the knowledge-based society, paradoxically, decisions made under uncertainty conditions occur more frequently. Limitations arising from access to information, data processing, logical methods and criteria selected at a particular point etc. increase the number of sources of uncertainty in the decision-making process. In order to cope with the avalanche of "data" and "information", companies have developed departments in their organisational structure specialising in knowledge-management activities focused on analysing and ordering this new space. The fundamental principle of the knowledge-based society is the sharing of information related to the field, the regulations and norms and the various opportunities for economic and social actors. In reality, the situation on the ground has been shown to be different though. Most often, information and knowledge have low levels of transparency, are dissimulated in increasingly complex systems and are even difficult to purchase.

Often times, only membership in an “interest group” will offer a chance of survival/accurate information.

Considerations on the concept of uncertainty

- *Before describing the uncertainty absorption approaches we must provide certain clarifications of the concept and its treatment.*
- *The term uncertainty is widely used. It has seen various developments as management theories have evolved. To define this concept we must make a distinction between three fundamental concepts:*
- *Certainty or strict determinism;*
- *First-order or reducible uncertainty (probability) – the case in which a probability can be associated to each decision-making option;*
- *Second-order uncertainty (uncertainty proper¹, total uncertainty², persistent uncertainty³) – a situation in which the probability of the occurrence of decision-making situations is not known.*

Certain researchers have added a fourth concept – i. e. ignorance⁴ or ambiguity⁵:

- *Third-order uncertainty, when neither the outcomes of potential courses of actions nor probability of occurrence of natural states are known.*

It is assumed that the decision-making situations under uncertainty conditions of the second and third order are characterised by a low level of completeness of information and very limited degree of accuracy of data. Compared with probabilistic decisions, decisions made under uncertainty conditions are less structured⁶. This is due to a large extent of the lack of information needed to establish the probability of the occurrence of natural states in the context of which economic processes unfold. The new conditions restricting the development of a decision are added to those in probabilistic models.

In approaching the decision-making processes under uncertainty conditions in management, the view expressed by I. Verboncu and O. Nicolescu is the most widely accepted. According to them, decision-making under uncertainty conditions are defined as situations in which the probability of achieving the objectives is high, yet there exist serious doubts as to the course of action to be taken. The emphasis is thus placed on factoring in a large number of variables, some of which are insufficiently controllable and whose evolution is difficult to forecast.

A different point of view from those outlined above deals with uncertainty as a key characteristic of life and as a source of progress, without distancing itself from the psychological view. Thus, in a progressive approach, Orio Giarini stated that “uncertainty may be described as the sum of all

¹ Panait C. Nica et al., *Management*, Editura Condor, Iași, 1994, p. 162

² Oscar Lange, *Decizii optime* [EN title: Optimal Decisions], Editura Științifică, Bucharest, 1970, p. 290

³ Călin Zamfir, *Incertitudinea - o perspectivă psiho-sociologică* [Uncertainty – a psycho-sociological perspective], Editura Științifică, Bucharest, 1990, p. 21

⁴ Panait C. Nica et al., *Management*, Editura Condor, Iași, 1994, p. 162

⁵ Călin Zamfir, *Incertitudinea- o perspectivă psiho-sociologică* [Uncertainty – a psycho-sociological perspective], Editura Științifică, Bucharest, 1990, p. 107

⁶ Ion Stăncioiu, Gheorghe Militaru, *Management: elemente fundamentale* [Management: fundamental issues], Editura Teora, Bucharest, 1998, p. 207

potential hazards around us, perceived or not”. Life’s uncertainties must be accepted as a reality, as the raw material for development and as an opportunity for maturity and real growth⁷.

Thus, the transition from the state of crisis to the state of opportunity becomes the ground on which technocratic, structural, cultural and political approaches make a difference in managing an organisation. In the knowledge management process, uncertainties emerge on the path from collecting data to gaining knowledge within the organisation and are dependent on technological constraints, accessibility, processing methods, theoretical models employed, and, last but not least, the human input.

Against the background of ever diminishing resources, as the dependency on information, on social and political contingencies, on technological change, etc. increases so does the importance of political approaches. The requirement that everyone keep up to date with the legislation that their respective field and its development implies a strategic opportunity in the knowledge-based society. The probability of lacking information or not being attuned to a highly dynamic environment translates into uncertainty and can result in missed opportunities and the risk of falling into crisis or bankruptcy.

There are many questions regarding the way in which a small or medium enterprise can become involved with logically grounded arguments in this management game. First of all, we aim to distinguish to what extent can a small or medium-sized economic operator be influenced by the game of major actors. Consequently, we are naturally led to ask: to what extent can the SME adapt to or even contribute to shaping these contexts.

Political approaches to uncertainty absorption

History has shown that practice has been far ahead of theoretical approaches, often times politics interfering in the economic sphere both with positive effects, by encouraging development, and with negative ones, by protecting interest groups, securing monopolies on the market, limiting the free movement of labour, technology, capital or goods depending on the various orientations.

Thus it has become obvious that, under the current circumstances, it is no longer advisable for SME managers to structure their strategies only on their technocratic capacity to analyse and predict future events and to plan according to such forecasts. The rigorous use of the firm’s whole potential in an increasingly dynamic environment can only rely on ingenious strategies that shape the future contexts in which the firm will operate.

Increasingly, regardless of their size, firms are interested in being involved, either in partnership with other stakeholders in the environment (economic or social partners), either individually, in activities that should shape and control the current contexts and to predetermine the future events that may affect them.

These approaches aimed at absorbing uncertainty using political levers primarily focus on three directions:

Shaping the social and political context

Normally, the state, by virtue of its powers, must safeguard the principles of market economy, and legitimise and support its values. Practical experience has shown that each individual advantage matters and that one of the major clients on the market is the state itself, a fact that must not be neglected under conditions of financial or economic crisis.

⁷ Orio Giarini, Walter R. Stahel, *Limitele certitudinii* [Original EN title: The Limits to Certainty], Editura Edimpres-Camro, Bucharest, 1996, p. 318, 327

This course of action is required under the current circumstances as central government authorities, foreign governments and other external factors interfere decisively in shaping the current and future of the enterprise. Managers cannot afford that the future of their firm be determined by random variables outside their control, as uncertainty can have a high cost, sometimes even the very existence of an organisation. As long as on a domestic, regional or international market there is a visible interference of political power, it is vital to assess and at least provide feedback to each initiative that may change the economic balance on the market. We would like to stress that such an approach is not an incitement to break the law but rather to improve and shape the political, economic and social environment.

Parliament can impose strict regulations and punitive laws when the interests and actions of a company clash with the opinions of society, and the latter may exert pressure to secure a greater contribution and commitment on the part of firms to the overall welfare, to the equal treatment of sexual or ethnic minorities, to sustainable development, to protecting and cleaning the environment, etc.

In light of the above, the organization is required to have some level of control over its own destiny by promoting and maintaining a favourable political context for its business. In general, the actions that an organisation can engage in may be classified as follows:

I. Activities aimed at gaining social legitimacy

These include actions that an organisation may pursue in order to secure the achievement of its objectives and that focus on the dimension of **direct acceptance** by civil society. At the beginning, every social environment gives credit, **indirectly** only, a blank cheque (similar to the presumption of innocence) to the good intentions and commitments of an organisation. The moment when a legal entity clashes with the civil society (over issues ranging from public health, the environment to discrimination, collective morality etc.), the civil society will exert pressure on the legislative body to force an intervention in order to either fill a legislative loophole by punitive provisions or to outlaw a particular activity of the organisation or the organisation itself.

Organisations must not treat the acceptance and support of communities in dismissive manner or worse, turn them into open enemies. A prerequisite in our times is to survey the public opinion and to engage in activities that will foster a favorable climate for the business. Systematic criticisms of the activities of certain firms have tended to evolve into calls for decisive action by the legislature or the government, especially in election years.

II. Activities aimed at shaping the socio-political context according to the organisation's interests

The shaping of the socio-political context must not be approached only in terms of active opposition to certain legislative bills that are counter to the interests and objectives of the firms or only in a "laissez faire" manner. Nowadays the focus is increasingly on initiatives that promote the firm's own interest by means of policies and programmes that lead to support for the field of activity or industry of the firm.

The success in promoting the interests of a firm in the local or central political circles can be secured by various methods, which include:

- Public information campaigns on the key issues and commitments of the business community;
- Formal representation at political level (governments and agencies thereof, legislative commissions, economic commissions at local government level, local councils, prefectures, etc.) in

order to highlight (by verbal notes or by written interventions such as memoranda) the views and interests of those it represents (i. e. the field of economic activity, industry, employers' associations, business or professional groups, or even certain firms with major impact locally, etc.). The easy access thus gained to political actors cannot be fully exploited without solid argumentation based on professional surveys and research that should impress the experts of central and local government;

- Lobbying⁸ to defend the specific interests and development objectives.

Shaping the technological context

Guiding and cementing the main avenues of development of technology using political levers has become a priority, as the timeframes lacking major discontinuities have become increasingly limited. The more the field of activity is dominated by high-end technology, in particular automation and IT-related features, the more such intervals are reduced⁹. The emergence of new technologies that can cause major disruptions in the development cycle of a firm or of a product even leading to loss of market share, the change of the field of activity or even bankruptcy.

Several categories of activities may be considered, including:

- Using qualitative technocratic, reasoning methods to forecast the emergence of technologies and the strategic reorientation of activities to cope with future conditions;
- Specific fundamental research;
- Taking steps to shape the market and competition, by setting national and international standards, facilitating the registration of trademarks, using laws to promote access to high-end technology;
- Taking structural actions to defend the organization from technological risk.

Shaping the market and the competition

Shaping the market and the competition is necessary considering the increasingly fierce competition in the same product category, featuring constant inroads by new firms, substitute products, elevated flexibility of the customer pool, etc.

In order to exert effective control over the market and favorably shape its fluctuations, the organisation has several tools at its disposal:

- Market domination strategies – securing the best protection against market uncertainty, based on strategies such as implementing a constant and rapid innovation process; substantial investment in marketing; pre-emptive increases of the production capacity, etc.
- Vertical and horizontal integration; this can be achieved by means of a series of acquisitions and transfers in order to dominate the market and influence the competition environment; reducing the exposure to a strong supplier or buyer is often achieved by vertical integration;

⁸ Ovidiu Nicolescu, Ion Verboncu, *Management*, Editura Economică, Bucharest, 1999, p. 87

⁹ Al. P. Tacu, R. Vancea, S. Holban, A. Burciu, *Inteligență artificială. Teorie și aplicații în economie* [Artificial Intelligence. Theory and applications in economics], Editura Economică, Bucharest, 1998, p. 84

- The transfer of risk and uncertainty to other factors;
- Using certain instruments to discipline the competition; reducing the vulnerability of the organization to the behavior of large competitor firms has become a necessity due to the expanding arsenal of marketing strategies, the reinvention of the same product, the higher rate of new product launches all leading to an almost continuous process of market and industry modification.

In the case of SMEs, caution and mutual support, the need to cope together to the uncertainty derived from fluctuations in demand occurring with any change in the status quo, have become particularly important in developing the companies' policies, coupled with the need for discipline by engaging in "positive" constructive rivalry, based on rules and commitments and even on cooperation strategies.

Using elementary triangular fuzzy numbers in assessing the influence of policies

Normally, the state, by virtue of its powers, must safeguard the principles of market economy, and legitimise and support its values. Practical experience has shown that each individual advantage matters and that one of the major clients on the market is the state itself, a fact that must not be neglected under conditions of financial or economic crisis.

The analysis of the influence on the field of activity of the manner in which the firm can cope with changes in regional or national policies can be considered a process under uncertainty conditions.

To conduct such an assessment process, we propose the use of nuanced triangular numbers, precisely because of the difficulty to quantify exactly or probabilistically both the economic indicators and the socio-economic, technological etc. influencing factors.

Let us take as a case study the following possible practical example. In order to support the development of the business environment in the field of bread industry, employers and labour unions propose several measures to be included on the joint agenda. There are various divergences related to the ways and extent that this will affect each partner. We therefore propose the use of the Abraham-Wald method, maximax and Hurwicz, in a complex process of analysis of the impact of such possible measures.

We will consider three possible strategies, to be assessed in qualitative terms based on the possible evolution of indicators related to the market, the financial state, the economic state and the technical state.

A matrix of consequences is generated, consisting of three decision-making situations, assessed based on four criteria.

Table 1 The matrix of consequences with fuzzy numbers

	MI	FI	EI	TI
V1	[1,5 ; 2 ; 2,5]	[12 ; 18 ; 20]	[12 ; 15 ; 16]	[65 ; 70 ; 85]
V2	[1,1 ; 2,2 ; 2,6]	[14 ; 17 ; 21]	[13 ; 14 ; 18]	[55 ; 65 ; 80]
V3	[1,6 ; 1.9 ; 2,2]	[13 ; 19 ; 22]	[11 ; 13 ; 15]	[60 ; 70 ; 75]

In this matrix we made the following notation:

- MI*- indicators related to the market
- FI* - indicators related to the financial state,
- EI* - indicators related to the economic state
- TI* -indicators related to the technical state

In our application we will use O.Gherasim point of view. In this case all operations with fuzzy numbers use the associated center of gravities (CG) and special associated ranking criteria. We will determinate the matrix of utilities with equal weights.

The matrix of utilities with equal weights

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The matrix of utilities with equal weights

	MI	FI	EI	TI
V1	[-1.597 ; 0.347 ; 1.718]	[-0.800 ; 0.000 ; 0.800]	[-0.337 ; 0.204 ; 0.786]	[-0.600 ; 0.200 ; 1.200]
V2	[-2.226 ; 0.613 ; 2.016]	[-0.740 ; -0.080 ; 1.100]	[-0.286 ; 0.143 ; 1.000]	[-0.500 ; 0.000 ; 0.500]
V3	[-0.605 ; 0 ; 0.605]	[-1.400. ; 0.200 ; 2.000]	[-0.286 ; 0.000 ; 0.286]	[-0.520 ; 0.140 ; 0.640]

Will have to choose the best options after appli Abraham-Wald, maximax and Hurwicz methods. Application results are presented below:

	MaxiMax	CG	Abraham-Wald	CG	Hurwicz($\alpha=0.5$)	CG
V1	[-0.600 ; 0.200 ; 1.200]	0.250	[-0.800 ; 0.000 ; 0.800]	0	[-0.700; 0.100; 1.000]	0.125
V2	[-2.226 ; 0.613 ; 2.016]	0.254	[-0.500 ; 0.000 ; 0.500]	0	[-1.363; 0.307; 1.258]	1.127
V3	[-1.400. ; 0.200 ; 2.000]	0.250	[-0.605 ; 0 ; 0.605]	0	[-1.002; 0.100; 1.302]	0.125

Note that not all options are clearly differentiated . We will apply the ranking criteria associated.

According to the Wald method, the order is: $V1 > V3 > V2$

After MaxiMax method, the order is: $V2 > V3 > V1$, and after Hurwicz($\alpha=0.5$) method, the order is $V2 > V3 > V1$.

Conclusions

Within a Knowledge Organization a large proportion decision problem is based on qualitative assessment of specialists in the field of knowledge.

By using variable centers of weight associated to fuzzy number, we try, through a multidisciplinary approach, to develop and complete the portfolio of political instruments that managers can use for decision-making foundation.

REFERENCES

- Alecu I.C., Jaba O. (2009), „The Yearbook of the „Gh.Zane,, Institute Of Economic Research-Iassy”, „Unconventional methods of strategic distribution of the incertitude”, Bucuresti: Editura Academiei Române, Volumul 18, pg 13-22
- Alecu I.C. (2008), „The Yearbook of the „Gh.Zane,, Institute Of Economic Research-Iassy”, „The use of fuzzy numbers in evaluating human resources in uncertain circumstances”, Bucuresti: Editura Academiei Române, Volumul 17, pg 13-22
- Boldur Gh. (1973), *Fundamentarea complexă a procesului decizional economic*, București: Editura Științifică
- Gherasim O. (2005), *Matematica numerelor fuzzy triunghiulare*, Iasi: Editura Performantica
- Gil Lafuente A. M. (1994), *Analiza financiară in conditii de incertitudine*, Bucuresti : Editura AIT Laboratoires
- Gonzales Santoyo F., Romero Beatriz Flores, et al. (2004), “Fuzzy Economic Review” “*Uncertainty Teory Applied To Optimal Selction of Personnel in a Enterprise*”, Volum IX, Nr.2, November
- Hofstede G. (1996), *Managementul structurilor organizaționale*, București: Editura Economică
- Yvan A, Fîrșiroiu Mihaela (1998), *Management strategic*, București: Editura Economică
- Mănescu M. (1979), *Cibernetica Economică*, București: Editura Academie Romane
- Nicolescu O., Verboncu I. (1999), *Management*, București: Editura Economică,
- Popescu I.A., Găvănescu Pa., Rădulescu D. (1983), *Introducere în fundamentarea deciziei*, București: Editura Științifică și Enciclopedică
- Scarlat E., Chiriță N. (1997), *Sisteme cibernetice ale economiei de piață*, București: Editura Economică,
- Stăncioiu I., Militaru Gh. (1998) *Managemen:elemente fundamentale*, București: Editura Teora
- Steve Cooke, Nigel Slack *Making Management Decisions*, Editura Prentice Prentice Hall, 1991