

A COGNITIVE APPROACH TO CORPORATE GOVERNANCE: A VISUALIZATION TEST OF MENTAL MODELS WITH THE COGNITIVE MAPPING TECHNIQUE

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The idea of this paper is to determine the mental models of actors in the firm with respect to the cognitive approach of corporate governance. The paper takes a corporate governance perspective, discusses mental models and uses the cognitive map to view the diagrams showing the ways of thinking and the conceptualization of the cognitive approach. In addition, it employs a cognitive mapping technique. Returning to the systematic exploration of grids for each actor, it concludes that there is a balance of concepts expressing their cognitive orientation.

Key words: *corporate governance, cognitive approach, cognitive mapping, mental models, structural analysis*

1. INTRODUCTION

As shown by Charreaux [1], the approaches to a break with the paradigm contract can be grouped under the term “*cognitive theories of the firm*”. According to the same author, Charreaux, these theories include current behavior [2], evolutionary theory [3], and the theory based on resources and expertise. After briefly characterizing the cognitive approach, our goal is to analyze the contribution of this approach and thus identify its key concepts.

2. LITERATURE REVIEW ON THE COGNITIVE APPROACH TO CORPORATE GOVERNANCE

Langlois and Foss [4] indicate that the majority of studies related to contractual theories of the

organization, focusing exclusively on the notion of information asymmetry and conflicts of interest it generates, does not offer an analysis of the process of value creation. Interested only in the distribution of value, this work therefore obscures the productive dimension of building value by the company and does not give their place to levers such as competence, knowledge, the innovation and learning that appear to play an important role in the research of more competitive sources of value creation in a sustainable manner. Cognitive theories focus particularly on creating internal knowledge from organizational learning. In this respect, it is worth mentioning that performance is seen as more of a leader's ability to imagine, innovate, to receive new investment opportunities and act on the environment in such

a way as to restructure existing processes. The firm is seen as a repository of knowledge, not only as a nexus of contracts. Value creation depends primarily on the identity and distinctive competencies of the latter, as well as on its ability to create knowledge [5]. The cognitive approach attaches more importance to the contribution of intellectual capital in creating value. Thus, in the context of the cognitive approach to governance, the cognitive cost optimization is the main lever for value creation.

Contrary to common contractual governance in the current cognitive, the problem is not that of aligning the interests of managers and providers of resources but of qualitative coordination, alignment and patterns of cognitive models anticipation: cognitive adjustments between the various stakeholders. Charreaux [6] then defines corporate governance as the set of mechanisms used to increase the potential for value creation through learning and innovation.

According to Poincelot and Wegmann [7], a cognitive perspective on governance mechanisms must enable the management to inform on how to achieve the objectives assigned to it. This vision includes proactive governance including the behavioral theory of the firm based on the work of Simon and Cyert and March [8], evolutionary theory, theory of organizational learning and theories of resources and skills. In the cognitive vision of governance, the role of the board goes beyond the interests of shareholders; it is a mechanism to ensure the best possible cooperation between managers and shareholders [9].

2.1. THE KEY CONCEPTS OF THE COGNITIVE APPROACH: VALUE CREATION OPERATING SKILLS, KNOWLEDGE AND ORGANIZATIONAL LEARNING

The common cognitive theory has it that value creation comes from knowledge. The source of value creation is linked to elements difficult to imitate and which provide a significant competitive advantage and sustainability. The determinants of value creation as approached by the cognitive theories are of sociological and psychological origin.

The behavioral theory (behaviorist theory) gives more prominence to the psychological dimensions of value creation. Achieving the desired performance requires knowledge of the behavior of actors or groups of actors in an organization. Two assumptions underlie this theory: the rationality of individuals is limited [10], and an organization consists of a coalition of actors with specific objectives which is a source of differences and potential conflicts. Accordingly, the principle of maximizing the satisfaction replaces the traditional principle of maximizing value for shareholders. The decision making process is interactive and emerges from the possibility of organizational learning.

The theories of organizational learning postulate that competence creating value comes from the knowledge of organizational routines and, in the case of the evolutionary theory [11], from the knowledge of the latter's development. Routines are

patterns of behaviors and interactions that individuals are able to use to deal with different situations that arise. The construction of these routines is organizational learning (collective). Moreover, they are usually tacit (neither codified nor transferable).

2.1.1. CONTROL MODES OF ORGANIZATIONAL COMMUNICATION, EXCHANGES AND TRAINING

In general, cognitive theories are based on emerging modes of control. These control modes aim at coordinating routines and at promoting the emergence of secondary skills by providing detection devices and adequate analysis (the concept of leading indicators) and by facilitating organizational learning through the encouragement of organizational exchanges, communication and training. In addition to this overview, it is interesting to show that certain theories in organizational control, that is to say, theories of performance appraisal and pilot organizations, are part of the cognitive perspective. We present two approaches particularly significant.

Thus, with the uncertainty approach, the company must use other methods of control than those of a disciplinary nature (i.e. checking that the results are up to the goals and that behaviors are in accordance with the requirements of managers).

Modes of control refer to the contractual paradigm, while the informal modes of control enacted through culture and self-control refer to the cognitive paradigm.

2.1.2. COGNITIVE RESOURCES AND GROWTH OPPORTUNITIES

The emergence of a governance model extended to cognitive limitations of the model comes from its explanatory feature [13]. This model seeks to explain the long-term success of firms and, specifically, why some firms are more profitable than others [13]. In this traditional view of governance inherited from the seminal work of Berle and Means [14], the value created is essentially the control over the executive, namely the use of internal mechanisms such as board of directors, audit committee, independent directors, and of external ones like the financial market, labor market leaders, regulators to limit its discretion level in the decision making process. Indeed, shareholders delegate decision rights to their leader and they must ensure that the latter does not use them for his/her exclusive benefit, nor squanders them. In the end value is created from the effectiveness of the mechanisms in place.

However, as noted by Charreaux [15], it may happen that a leader who has achieved good financial results is still overwhelmed with the decisions to be made.

2.1.3. COGNITIVE LEVERS: INNOVATION, CAPABILITIES AND SPECIFIC SKILLS

The vision on legal and financial governance adopted by the stakeholders focuses on the levers that, at a disciplinary level, are expected to provide the distribution that maximizes the value (that is to say that minimizes agency costs).

Thus, the source of value creation is purely disciplinary and linked to the minimization of conflict. If the disciplinary approach is still appropriate in the case of the dispersed corporate managerial capital, recent studies highlight its restrictive nature particularly in the case of innovative firms [16]. Value creation could not be reduced to a simple problem of discipline, but would also include a cognitive dimension, actually centered on the cognitive levers related to innovation and learning, which can create value. As presented by various strands of research in strategy, this approach highlights the central role of knowledge, skills and specific skills of the manager and his team [17]. This knowledge is often tacit.

They contribute to both encouraging innovation and strengthening competitive advantage and appear as real vectors of sustainable value creation [18]. Cognitive theories are based on four common dimensions. The first is the current behavior of the firm [19]. Such an approach views the firm as a political coalition and a cognitive institution that adapts and learns (organizational learning). The second is based on the Neo-Schumpeterian economic theory of evolution [20] which defines the firm as an entity made up of activities undertaken in a coherent way, a repertoire of productive knowledge, a system of interpretation which emphasizes the notion of competition based on innovation. The third is based on strategy theories focused on resources and skills (“resource based theory”) that view the company as both a set of resources and an entity formed through the accumulation

of knowledge and guided by the vision of experienced leaders. As such, sustainable growth must be supported by the ability to learn and by the specificity of the accumulated knowledge. The fourth is the power of organizational learning [21] which emphasizes the cognitive view on learning organizations.

2.1.4. COGNITIVE THEORY OF GOVERNANCE: A DIFFERENT VIEW ON VALUE CREATION

This theory rejects the assumption of calculative rationality in favor of a so-called procedural rationality. Rationality can be assessed in terms of decisions, rather than in terms of the processes that govern them. In this theoretical approach to governance, value creation depends primarily on identity and skills that are designed as a coherent whole [22].

Similarly, the pattern of creation and ownership of the value that underlies it is different from that underlying the disciplinary theories. In this approach, the organization is seen as a repository of knowledge able to perceive new opportunities, create value in a sustainable manner. The value comes from the emergence of all the opportunities. In addition, particular emphasis is given to the productive capacity in terms of innovation for coordination.

From a cognitive perspective, Charreaux defines corporate governance as the set of mechanisms that have the potential to create value through learning and innovation.

Each of these theories suggests different modes of value creation. If the first two theories have a more static value creation, the cognitive approach gives a dynamic view.

These three theories give a different view on governance mechanisms and, ultimately, to their implementation.

3. RESEARCH METHODOLOGY

3.1. METHODOLOGICAL TOOLS

I chose to approach the performances of the company by using cognitive mapping, a common technique in cognitive approaches. This is a graphical modeling technique of cognition used in numerous studies in management sciences. The cognitive map is not the only tool for analyzing the managerial cognition, but it is the most popular for the presentation of cognitive structures.

Cognitive mapping is a well established technique that captures the minds of the players about a problem or situation. A cognitive map allows the researcher to view certain ideas and beliefs of an individual on a complex area such as corporate governance. A cognitive map is usually defined as the graphical representation of a person's beliefs about a particular field.

A map is not a scientific model based on an objective reality, but a representation of a part of the world as seen by an individual.

3.2. DESCRIPTION OF THE EMPIRICAL INVESTIGATION

To meet the research objectives mentioned above, a survey was conducted among players in a company from Tunisia. I have chosen to employ an exploratory approach using multiple case studies in order

to seek a better understanding of the phenomenon. The method of using multiple case studies allows for the study of a phenomenon in its natural setting, as well as for exploring little-known phenomena. Thus, the case studies method allows for multiple accounts of the specificities and characteristics of corporate governance.

The data is gathered from 10 firms. The decision to focus my study on a sample of firms from various sectors is based on the assumption that a variety of issues will be addressed, as well. The output is a cognitive map for actors reflecting their perceptions vis-à-vis the stakeholder approach to corporate governance. The method used to create cognitive maps is the questionnaire.

3.3. PRESENTATION OF THE QUESTIONNAIRE

The questionnaire is divided into two parts: the first identifies the company and the second deals with corporate governance. For the second part, related to corporate governance, we interviewed firm stakeholders about corporate governance by providing a list of concepts for each approach with systematic exploration grids and cross matrices.

The systematic exploration of the grid is a technique for collecting materials. Each player is encouraged to explore their own ideas or cognitive representations in relation to their strategic vision. The subject is asked to identify important factors that, in his/her opinion, have an impact on the key concepts related to corporate governance.

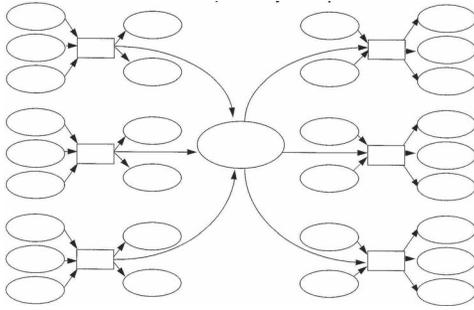


Fig.1.Grid systematic exploration

Regarding the cross-matrix, it is also a technique of data collection and the basis for the construction of the cognitive map. The matrix is presented in the form of a table with n rows and n columns. Box of index (i, j) indicates the relationship between concept i and concept j . The actors manipulate the key concepts and assign pairs of concepts depending on the nature and degree of proximity sensed between these concepts.

Table 1: Adjacency matrix

	Concept 1	Concept 2	...	Concept n
Concept 1	1			
Concept 2	L21	1		L2n
...			1	
Concept n	Ln1	Ln2		1

3.4. PROPOSAL FOR MODELING COGNITIVE MAPS

When it is difficult to identify the goals, an integrated approach to performance provides a holistic

view in which performance is analyzed through the processes that lead actors' performance. There are two implementation problems with these representation processes: the sharing of actors' representations and the identification of dominant representations in the organization in order to act upon them.

The construction of this representation necessarily requires a model that allows understanding. Such a model can be defined as *"an action of intentional design and construction, for composition of symbols, patterns that would make a complex phenomenon to be perceived in an intelligible manner. In this context, the use of cognitive maps seems relevant because they can take into account the complexity and comprehensiveness of the system in which [the behavior] is embedded, while maintaining access to the analysis"* [23]. The value of the tool is instrumental [24] and it allows both improving their actions and making sense.

Cognitive mapping is used as a tool for the representation of an idiosyncratic schema [25] and a pattern is defined as *"a cognitive structure that guides the cutting of reality, the interpretation of events, and actions of individuals"*, a pattern unique to each individual causing it to have its own behavior.

3.5. THE CONSTRUCTION OF COGNITIVE MAPS

First, we will discuss the construction of concepts, as well as the methodological approach. Then we will examine how the maps were constructed.

3.5.1. CONCEPTS

We addressed the issue of corporate governance through the representations constructed by players and by using the method of cognitive maps, a method that can be applied to poorly structured situations. An analysis based on cognitive maps can facilitate the understanding of the structuring process, as the aim of this model is to build or rebuild the mental processes simultaneously. This construction takes the form of a structure whose role is that of clarification. In this respect, the latter helps to identify implementation ways in order to achieve a given goal, as well as to identify the goals justifying the use of such means. Finally, it facilitates communication and negotiation.

There are two major trends in the construction method of the maps: the determination of the concepts can be *ex ante*, or through subsequent interviews with respondents for whom the maps are built. Komocar [27] links the question of determining nodes - or concepts - to two paradigms: the phenomenological and the normative ones. In the phenomenological paradigm, the universe is largely unknown. The emphasis is on describing the world from the experiences of people. The nodes and links are determined directly by the participants. In this respect, Cossette and Audet [28] advocate that the subject of the investigation should not be deprived of representations. Therefore, the questions should be invitations for the respondent to verbalize his thoughts on what he considers a subject of importance for the research. In addition, the researcher cannot force

the subject to consider every possible link because the links must be made spontaneously or in response to open questions, so that the subject constructs his/her own reality [29]. In the normative paradigm, the universe is more or less determined. The focus is on operational definitions and the research plans are reproducible. As a result, the observers and the participants to the research endeavor may determine the relationship between variables and nodes.

Based on a literature review and on an exploratory study based on a questionnaire made up of grids of systematic exploration and cross-matrices, we identified 14 concepts as best describing the stakeholder approach to the field of governance. These concepts are presented in the table below.

Table 2: Key concepts for stakeholders' approach to governance

1.	Knowledge (KN)
2.	Creation of value (CV)
3.	Competence (COMP)
4.	Organizational learning (LORG)
5.	Control (CON)
6.	Communication (COMM)
7.	Training (TR)
8.	Cognitive resource (RES COG)
9.	Growth opportunity (GR OPP)
10.	Innovation (INN)
11.	Specific capacitance (SP C)
12.	Rationality (RAT)
13.	Patterns of creation and ownership of the annuity (PCOA)
14.	Repertoire of knowledge (REP KN)

4. MATERIALS AND METHODS OF STRUCTURAL ANALYSIS

The scientific analysis was based on the results yielded by a preliminary investigation into the perceptions of the study subjects from the Tunisian company concerning the stakeholders' approach to governance.

This investigation was limited to the analysis of a collective cognitive map for all the company prepared on the basis of systematic exploration grids completed by the actors within that company. Furthermore, from the cognitive maps we could identify and qualify the design of the corporate governance. The development and analysis of cognitive maps were made using the Mic-Mac software. Our initial investigation focused on two elements: the relative importance of concepts and analysis of the dynamics of influence / dependence concepts (or variables) in the cognitive universe of players in the company. The relative importance of concepts was evaluated with the help of the aforementioned software. Thus, the Mic-Mac program allowed us to rank the concepts in such a way as to reach "balance" and "dependency". Consequently, the ideas dominating the cognitive universe of players could be brought to surface.

4.1. OVERVIEW OF THE STRUCTURAL ANALYSIS METHOD

The main objective of structural analysis is to identify the most important variables with a role in determining the evolution of the system. Inspired by graph theory, structural analysis is based on the description of a system using a

matrix linking all its components. By weighting these relationships, the method highlights the key variables to changes in the system. As a tool, we opted for the "Mic-Mac" software (cross-impact matrices, Multiplication Applied to Classification).

The first step of the Mic-Mac method is to identify all the variables characterizing the system under study (both external and internal variables). The second step involves the linking of variables in the construction of the matrix of direct influence and potential. Indeed, this approach is supported by the fact that in a systemic approach, a variable exists only through its network of relationships with other variables. It is from this matrix that the key variables are identified. Indeed, we obtain the classification by the direct sum row and column. If the total connections line indicates the importance of the influence of a variable on the overall system (direct motor level), the total column shows the degree of dependence of one variable (level of direct dependence). The ranking against indirect detects hidden variables through a matrix multiplication program applied to indirect classification. Thus, this program allows us to study the distribution of impacts by the paths and feedback loops, and therefore to prioritize the variables in order of influence.

4.2. MATRICES AND PROCESSING THROUGH THE MICMAC METHOD

All the structural analysis matrices above have been established only from the direct relationships between

variables. However, it is clear that a variable can also exert influence on other variables indirectly, or through another variable (“path” of order 2), or through several others exercising their influence in a cascade manner with the possibility of overlapping. The classification of motor skills may be significantly altered, and, similarly the understanding of the mechanisms of the system.

Establishing direct relations matrices indirect paths of length two, then three ... then N would quickly become intractable.

A relatively simple mathematical processing (multiplication of a matrix by itself, and elevation of the power matrices N) solves this problem. Benefiting from the spread of computers and personal computer, the MICMAC method (cross-impact matrix-multiplication applied to classification) is a commercial version. As expected, the rankings of variables by motor / decreasing influence (or dependence) generally find it changed. But experience has shown that these rankings become almost stable after three or four iterations and they clearly show the importance of some new variables in terms of their indirect influences.

Mapped and analyzed at the collective level, the map is the collective model of mental representations of several people on a research topic identified. In some cases, the maps are developed by collective aggregation of individual maps while in other cases they are developed directly by building a group map. In the first case, the map is called collective and such a composite map is constructed by superimposing individual maps [30].

In the second case, the maps are called strategic and more individuals come together to create a community map. Based on this, the researcher seeks then to map the shared perceptions of a group of individuals on a particular area.

4.2.1. PRESENTATION OF VARIABLES

Table 3: List of variables

Knowledge (KN)
Creation of value (C V)
Competence (COMP)
Organizational learning (LORG)
Control (CON)
Communication (COMM)
Training (TR)
Cognitive resource (RES COG)
Growth opportunity (GR OPP)
Innovation (INN)
Specific capacitance (SP C)
Rationality (RAT)
Patterns of creation and ownership of the annuity (PCOA)
Repertoire of knowledge (REP KN)

4.2.2. THE INPUT

This step was to compile a matrix of direct influence between these variables in a scoring session. Matrix of direct influence (MID) which describes the relationship of direct influence between the variables defining the system and the Matrix Influences MIDP represents the potential direct influences and dependencies between existing and potential variables. The scoring has developed the input matrix: “matrix of direct influences” (MID).

The influences are rated from 0 to 3, with the ability to report potential influences.

A matrix of direct influence (MID) describes the relationship of direct influences between the variables defining the system.

The influences are scored from 0 to 3: 0: No influence; 1: Low; 2: Average; 3: Strong

Table 4: Matrix of direct influences

	KN	CV	COMP	LORG	CON	COMM	TR	RESCOG	GROPP	INN	SPC	RAT	PCOA	REPKN
KN	0	0	0	0	0	0	0	0	0	2	0	3	0	1
CV	0	0	0	1	0	0	0	P	0	0	0	0	0	0
COMP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LORG	0	1	2	0	P	0	0	0	0	2	0	3	0	2
CON	0	1	0	0	0	3	0	0	0	2	0	0	0	0
COMM	0	0	0	0	P	0	0	2	0	0	0	1	0	3
TR	0	2	0	0	0	0	0	0	0	1	0	0	0	0
RES COG	0	0	2	0	0	0	P	0	0	0	3	0	0	0
GROPP	0	1	0	0	1	0	0	0	0	0	0	0	0	1
INN	2	0	0	1	0	0	2	0	3	0	0	3	0	0
SPC	0	1	0	1	0	0	0	2	0	0	0	0	0	0
RAT	3	0	0	1	0	0	0	1	0	0	0	0	0	2
PCOA	0	0	1	0	1	0	3	0	0	2	0	1	0	0
REP KN	1	0	0	3	0	0	2	0	0	0	1	0	0	0

5. RESULTS OF THE STUDY

5.1. DIRECT INFLUENCES

Characteristic of MID

This table shows the number of 0, 1, 2, 3, 4 of the matrix and displays the filling ratio calculated as the ratio

between the number of MID values different from 0 and the total number of elements of the matrix.

Table 5: Characteristic of MID

Indicator	Size of matrix	No of iterations	No of zero	No of one	No of two	No of three	No of P	Total	Fil rate
Value	14	2	149	19	14	10	4	47	23,97959%

Stability from MID

If it is shown that any matrix must converge to stability after a certain number of iterations (usually 4 or 5 for a matrix of size 30), it was interesting to monitor the stability during the successive multiplications.

In the absence of mathematically established criteria, it was chosen to rely on the number of permutations (bubble sort) necessary to classify each iteration, influence and dependence, all the variables of the matrix MID.

Table 6: Stability from MID

Iteration	Influence	Dependence
1.	104%	105 %
2.	98 %	105 %

Table 7 is used to enter the sums in the row and column of the matrix MID

Table 7: Sum of rows and columns

N°	Variable	Total of rows	Total of columns
1.	Value creating	6	6
2.	Opportunity	1	6
N°	Variable	Total of rows	Total of columns
3.	Contract node	0	5
4.	Specific investment	10	7

5.	Specific human capital	6	2
6.	Responsibility multiple	6	3
7.	Power	3	7
8.	Legitimacy	5	5
9.	Profit	3	3
10.	Residual claim	11	9
11.	Annuity	4	4
12.	Distribution	7	11
13.	Conflict	8	0
14.	Asymmetric information	7	9
	Totals	77	77

Potential direct influences

Characteristic of MIDP

Table 8, called “Characteristic of MIDP”, shows the number of 0, 1, 2, 3.4 and MIDP matrix displays the filling ratio calculated as the ratio between the number of MID values different from 0 and the total number of elements of the matrix.

Table 8: Characteristic of MIDP

Indicator	Value
Size of matrix	14
Number of iterations	2
Number of zero	149
Number of one	19
Number of two	14
Number of three	14
Number of P	0
Total	47
Fill rate	23,97959%

If it is shown that any matrix must converge to stability after a certain number of iterations (usually 4 or 5 for a matrix of size 30), it was interesting to monitor the stability during the successive multiplications. In the absence of mathematically established criteria, it was chosen to rely on the number of permutations (bubble sort) necessary to classify each iteration, influence and dependence, the set of variables. Thus, table no. 9 shows stability from MIDP.

Table 9: Stability from MIDP

Iteration	Influence	Dependence
1.	102%	117%
2.	91 %	93 %

Table 10 is used to enter the sums in row and column of the matrix MIDP.

Table 10: Sum of rows and columns

N°	Variable	Total of rows	Total of columns
1.	Value creating	6	6
2.	Opportunity	4	6
3.	Contract node	0	5
4.	Specific investment	13	7
5.	Specific human capital	6	8
6.	Responsibility multiple	9	3
7.	Power	3	10
8.	Legitimacy	8	8
9.	Profit	3	3
10.	Residual claim	11	9
11.	Annuity	4	4
12.	Distribution	7	11
13.	Conflict	8	0
14.	Asymmetric information	7	9
	Totals	77	77

Matrix of indirect influences (MII)

The matrix of indirect influences (MII) is the matrix of direct high power influences (MID), by successive iterations. From this matrix, a new classification of variables highlights the most important variables of

the system. Indeed, it reveals the hidden variables through a matrix multiplication program applied to indirect classification. This program allows us to study the distribution of impacts by the paths and feedback loops, and therefore to prioritize the variables in order of influence, taking into account the number of paths and

loops of length 1, 2, .. n from each variable in order of length, taking into account the number of paths and loops of length 1, 2, ...n arriving on each variable. The ranking is stable in general from an increase in the order 3, 4 or 5.

The values represent the rate of indirect influences.

Table 11: Matrix of indirect influences

	KN	CV	COMP	LORG	CON	COMM	TR	RESCOG	GROPP	INN	SPC	RAT	PCOA	REPKN
KN	24	27	22	25	6	0	12	8	0	50	15	66	0	48
CV	15	0	0	12	0	0	8	3	6	0	2	6	0	0
COMP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LORG	24	36	30	26	6	0	12	10	0	62	15	81	0	57
CON	36	17	18	36	6	0	18	9	0	18	27	21	0	34
COMM	2	31	22	15	0	0	4	18	0	38	5	48	0	26
TR	9	10	6	3	3	0	0	3	0	12	0	15	0	17
RES COG	0	3	18	3	0	0	0	0	0	6	18	9	0	6
GROPP	4	9	8	4	0	0	4	8	6	12	0	24	0	18
INN	56	6	12	64	0	9	42	9	24	30	22	60	0	33
SP C	15	7	2	18	0	0	8	15	6	2	2	9	0	8
RAT	57	19	12	41	0	0	26	22	24	20	5	48	0	38
PCOA	30	17	8	24	6	0	14	12	15	24	5	48	0	40
REP KN	63	1	6	51	0	0	34	12	30	2	13	33	0	26

Sum of rows and columns of MII

This table is used to enter the

sums in row and column of the matrix MII.

Table 12: Sum of rows and columns

N°	Variable	Total of rows	Total of columns
1.	Value creating	303	335
2.	Opportunity	58	183
3.	Contract node	0	164
4.	Specific investment	359	322
5.	Specific human capital	240	27
6.	Responsibility multiple	209	9
7.	Power	78	182
8.	Legitimacy	63	129
9.	Profit	97	111
10.	Residual claim	367	276
11.	Annuity	92	129
12.	Dispersion	312	468
13.	Conflict	243	0
14.	Asymmetric information	271	357
	Totals	77	101

6. CONCLUSIONS & IMPLICATIONS OF THE RESEARCH

Concepts (or variables) structuring the cognitive world of the actors can be projected in terms of influence/dependence. The distribution of the point cloud variables in this plan,

particularly in relation to different quadrants is to distinguish four categories of variables.

The first quadrant includes the most prominent concepts in the dynamics of thought of the actors. For the actors of that organization, the concepts of “control”, “communication” and “patterns of creation and ownership of the annuity” are the most dominant in their cognitions reflecting an intention based on a logic that differs from the cognitive discipline of logic. Returning to the systematic exploration of grids for each actor, there is a balance of concepts expressing their orientation. For actor 1, these concepts are expressed through statements such as “competence”, “productive capacity”, “learning process” reflecting an orientation to a productive logic.

The pattern of creation and appropriation of value underlying cognitive theories differ greatly from those underlying the disciplinary theories, in which the productive dimension is either ignored or reduced to aspects incentives [31]. It leads in particular to a different cause of the existence of the firm that not only allows to distinguish the market, but also its competitors, that is to say define an identity. For example, to Foss [32], firms exist because they can more efficiently coordinate the collective learning process.

For Dosi [33], firms are sets of key competencies and complementary assets associated with these skills and the boundaries of the firm must be understood not only in terms of transaction costs but also in terms of learning, path dependencies, technological opportunities, selection and assets complementarity.

The central element is the emphasis on the productive capacity in terms of innovation for coordination. Thus, the problem of coordination can be effectively tackled by defining the firm as a simple information system. From this perspective, the problem of coordination is not only a matter of incentives. Therefore, it should be reformulated with respect to a growth target that is established based on the processing and interpretation of information. With such use information must not be equaled to knowledge. Moreover, defining the firm as an information system implies taking a more complex perspective on the firm as an open system and, hence, the abandonment of the concept of balance in favor of the concept of process.

Efficiency depends not only on technology but also on the motivation and skills of the workforce, on the organizational and managerial supervision, the latter two being based on the institutional structures and routines and cultural norms inherited from the past.

Moreover, the perceptual dimension of the entrepreneurial function related to the ability of management to think, perceive, build new opportunities plays a key role, much more than the restructuring and reconfiguration of the business portfolios of firms in response to changes in the environment. In this respect, it should be reminded that the goal is to ensure sustainable value creation particularly through the construction of growth opportunities.

In summary, the firm as a processor or repository of knowledge is based on the following uses of the cognitive argument: (1) the orientation of the activity in accordance with the

vision of leaders, (2) the creation of knowledge that is characterized both as tacit and social and that, as a result of the aforementioned features, is used as a basis for difficult to imitate innovation and investment opportunities, (3) the protection of the knowledge base, (4) coordination of productive activity which involves the dimensions of the construction, operation and transfer of knowledge far beyond the mere transfer of information, (5) conflict resolution, which exceeds the conflicts of interest that only take a cognitive dimension.

The cognitive approach of the firm is to reconsider the role of governance. It must identify and implement cost-effective investments in a dynamic efficiency perspective. According to Demsetz [34], to understand the influence of the institutional framework so that the system of governance is based on dynamic efficiency, we must remember three objectives: (1) the ability to encourage a wide variety of experiences (2) the ability to promote investment for potentially successful experiment and to reject prospective non-bearing investments, (3) the ability to use extensively the new generated knowledge.

The criticism of the financial vision of governance joins this approach: we need to expand this vision in order to consider the quality of the relationship between managers and investors and the potential to increase the efficiency of the firm to identify and build opportunities for growth. In a broader perspective, the cognitive approach led to study the governance systems in terms of their influence on the different dimensions of cognitive processes of value creation.

The cognitive approach also leads to a reconsideration of the traditional financial approach to governance in which the relationship between the firms with financial investors is limited to the provision of capital and the only objective is to secure investment financial discipline. Or, as suggested by various authors, finance also includes a cognitive dimension.

Thus, Aoki [35] believes that in the model of governance associated with venture capital, it is not the venture capitalist's ability to provide funding, which is the most important factor. On the contrary, on the basis of his knowledge and experience the most important ability is to select the most promising projects, on the one hand, and to deny financing (or refinancing) for the least interesting projects, on the other hand in a timely manner. Similarly, Charreaux [36] offers an interpretation of the funding policy based on cognitive arguments, a policy that explicitly involves the provision of expertise on behalf of shareholders, including the industrial shareholders. Such developments argue for a reconstruction of the financial governance vision extended to the cognitive area.

For actor 2, this orientation is expressed in statements such as "information", "organization", "value creation", "schemas", "conflict", reflecting a logic-based cognitive understanding of ownership of the annuity. Cognitive visions focus primarily on the concepts of information and knowledge. From there, the organization is characterized by its ability to learn and generate knowledge: beyond the role of conflict resolution (contractual theories), the company

produces knowledge that contributes to the process of value creation. The concepts of learning, building skills and innovation are central. The second quadrant contains the relay variables that are by definition both very influential and very dependent.

By analyzing the level of influence/dependence, there are players for the concepts or ideas illustrating the concepts of "organizational learning", "innovation", "Knowledge Directory", "rationality" and "knowledge". The ideas of the players in the Tunisian firms tend to focus on three basic concepts namely "property", "investment" and "value creation". In this sense, the performance results from the creation of wealth that comes from making an investment that creates value. This achievement depends on the ability of each individual involved in the investment process to derive a satisfactory gain.

The third quadrant contains the dependent variables. They are both influential and very little dependent, particularly sensitive. They are the results explained by the variable motor and relay. Thus, a strong dependence of a number of factors such as training variables, and value creation is registered.

The fourth quadrant contains the independent variables that are simultaneously influential and somewhat dependent. The latter are excluded from the dynamics of thinking by the Tunisian company. The influences/dependencies' plan review shows the existence of a number of independent variables such as the variables related to cognitive resources, opportunity for growth, specific capacity, etc.

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