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University Governance: Empirical evidence from Tunisian Public Higher Education Establishments

Gouvernance universitaire : évidence empirique sur les établissements d'enseignement supérieur publics tunisiens

Islem Khefacha et Lotfi Belkacem

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Résumé de l'article

Le présent article examine la manière dont les décisions peuvent être prises dans les établissements d'enseignement supérieur publics tunisiens. Nous mettons l'accent sur le concept omniprésent mais souvent mal compris et même méconnu de « gouvernance universitaire ». En effet, trop de publications ont été consacrées à la discussion théorique de la notion de « gouvernance universitaire ». Pour notre part, nous pensons que cette dernière ne vaut qu'à travers son opérationnalisation dans une analyse empirique. En particulier, notre investigation empirique a pour objectif de révéler les facteurs qui augmentent ou qui diminuent d'une manière significative la probabilité que le processus décisionnel relatif à un domaine précis (pédagogique, scientifique, management institutionnel et personnel-enseignant) soit « plutôt collégial », « plutôt politique », « plutôt bureaucratique » ou encore « plutôt anarchique ».

University Governance: Empirical evidence from Tunisian Public Higher Education Establishments

by Islem Khefacha and Lotfi Belkacem

Abstract

This paper investigates the way decisions are taken in Tunisian public higher education establishments. We focus our review on the ubiquitous but not well understood concept of "university governance". Despite the presence of a large body of literature about governance in higher education, the lack of empirical research led us to think that it would be important to "operationalize" the concept of "university governance" in an empirical survey. To do this, we tried to identify the factors which may increase or decrease, in a significant way, the odds that the decision-making process relates to a precise domain (pedagogic, scientific, institutional management or academic personnel), and that this process follows the characteristics of four decision-making models in current use: collegial, political, bureaucratic or anarchical model.

Introduction

In a world where economic development depends mainly on technological progress and the knowledge which underlies it, higher education is confronted with an environment of constant change (Marginson, 2006). In fact, the globalization of the economy, the appearance of new forms of management and production, the advent of "global knowledge economy" impose on the different speakers in the university sector the acquisition of a new culture, predicated on fast integration of innovation and increasingly rapid adaptation to moving situations.

This context leads higher education to play a significant role in the foreground of economic development. It represents henceforth a strategic sector and a source of value, on which the long-term future of nations depends (Zghal, 2002). As a result, the university objectives, its system of organization and governance, its financial base, its processes of work and its role in the society are all facing a real challenge to the *status quo*.

It is from this perspective that we recognized the increasing power of research and studies about the concept of "university governance" over the past few years (Bleiklie and Kogan 2007; Kezar and Eckel 2004; Musselin 2001; Paradeise et al. 2009; Pusser 2003; Trakman 2008). In particular, we noted the way in which decisions are taken. However, it should be noted that the majority of studies on university governance are "theorizing" rather than empirically based. In fact, some authors noticed a scarcity of empirical research, especially in-depth case studies (Birnbaum, 1991). The lack of empirical evidence brought us to think that it would be important to 'operationalize' the concept of "university governance" in an empirical survey.

The main theme of our research is to contribute to a better understanding of the way in which an increasing set of heterogeneous stakeholders – from those who take the strategic decisions to the academics who traditionally consider themselves as autonomous – participates in the decision-making process, reacts towards it and influences it.

The article is structured as follows. We shall first look at the meaning of the concept of "university governance" in the context of our study. The second section outlines the theoretical basis of the article, namely by presenting the different decision-making models meant to describe

and explain the way decisions are taken in higher education organizations. After the formulation of some hypotheses resulting from our inductive analysis in section three, our empirical survey is set out in section four, suggesting a model of identification of factors having a significant impact on the occurrence of one of the four main decision-making models developed in the university governance literature. The results found in the final section may serve to support the university leadership in their evaluation and improvement of the governance in institutions of higher education.

University governance

Governance is a difficult phenomenon to define (Sedjari, 2004). From the historical standpoint, this concept appeared in 1937 thanks to the economist Ronald Coase and his article "The Nature of the Firm". In this era, the perspectives were oriented towards "corporate governance" which is studied in a deep manner since the 1980s.

This concept is thereafter expanded to be used by different academic disciplines having distinct jurisdictions: international governance (Lucier, 2007), employment governance (Lallement; 1997, 1999), university governance (Kezar and Eckel, 2004), global and communicative governance (Parsons, 1995; Kooiman, 1993), and urban, regional or European governance (Leresche, 2001).

In our study, a systematic review of the literature on governance in higher education showed the presence of many approaches which tried to explain and clarify it: philosophy, sociology, management, psychology, etc. Among the definitions proposed, we adopted the one advanced by Kezar and Eckel (2004) which considered "university governance" as "the process of policy-making and macro-level decision-making within higher education" (p. 375). It is a multi-level phenomenon which is characterized by:

1. The multiplicity of stakeholders involved directly or indirectly in the decision-making process. That's why it's important to identify all categories of actors concerned by the decision-making. Among them, we find:
   - The non-academic staff who ensures the continuity and the daily operations of the organization.
   - The academic staff who assumes some responsibility and possesses the political responsibility to exercise it to various degrees, according to their interests;
   - And the students who represent the pillar and the reason of being of the university organization.

   As a result, there is a relatively harmonious coexistence between the political legitimacy of the elected, the administrative legitimacy of the hierarchical leaders and the staff, and the legitimacy of academic personnel and students.
2. A process of interaction and negotiation between heterogeneous participants, which join forces, pool their resources and their skills, and create a new coalition of action founded on the responsibilities they share (Merrien, 1998). This interaction can take several forms. We are going to categorize the modalities according to the manner in which the decision-making is driven:
   i. *Regulator* which *forces* some actors to act in a standardized way (**bureaucracy**);
   ii. *Incentive* which *motivates* actors to act in a consensual direction (**collegiality**);
   iii. *Informative* which *convinces* actors to act in a certain way (**politics**);

iv. *Unpredictable* which is based on *randomness* (**garbage can**).

Background on decision-making models

The establishments of higher education are characterized by multiple levels of decision-making (Trakman, 2008). As a consequence, several models have been conceived in order to describe and explain how decisions are taken within this particular form of organization (Kezar and Eckel, 2004; Paradeise *et al*., 2009).

The collegial decision-making model

Thanks to Goodman (1962) and Millett (1962), one of the first theoretical models used to explain the particularity of the decision-making process was conceived. The "collegial model" put primary emphasis on concepts such as 'participatory, democratic decision-making, human needs, and ways in which organizations can be tailored to meet them' (Pusser and Ordorika, 2001: p. 10). Decisions, concentrated in the hands of peers, are taken in a *consensual* way (Musselin, 2001) that is presented as a natural consequence of shared values and responsibilities in the academic organization. According to this model, the decision-making process is based on the dominance of a consensus and a high degree of academic expertise and freedom (Hardy, 1996).

However, in an environment characterized by drastic change and expansion, the onerous burden of the decision-making process – that requires the consent of all stakeholders involved in the decision-making process and the homogeneity of the academic values and beliefs – can be considered a critical limitation of the collegial model (Clark, 2001). Hence, other competitor models have been developed. Some of them put the emphasis on the bureaucratic and rational character of the functions of the establishment (Blau, 1973; Mintzberg, 1979).

The bureaucratic decision-making model

In this model, Stroup (1966) argued that "university governance demonstrates many of the characteristics described by Weber in his work on bureaucracy" (cited in Pusser and Ordorika, 2001: p. 9). In fact, Kezar and Eckel (2004) have shown that the most important aspect in understanding governance in higher education is to examine organizational structures, such as the lines of authority, roles, procedures, and bodies responsible for decision making. The major themes examined include centralization, decentralization, authority, hierarchy and size of the establishment.

In addition, the bureaucratic model is based on universal criteria and the formalization of rules and procedures, where the efficiency and the achievement of the objectives represent the main features of the decision-making model (Baldridge, 1971). For example, from the moment there appears to be a criterion justifying the decision to create a new curriculum, a plan of execution based on a standardized application of procedures and rules is set up, without any real deliberation between the various parties involved. As a consequence, senior players monopolize and impose decision. They also influence, shape and create change in a particular direction.

The bureaucratic decision-making process has the tendency to exclude the involvement of some stakeholders and the important role that they could play in the decision-making process (Baldridge, 1971). Notably, Merton (1997) thinks that the bureaucracy is not as flexible as necessary in some situations since it privileges the formalism and ritualism in the application of rules to the detriment of the implication of stakeholders in the decision-making process. That's why laws, legislation and charters regulating the higher education sector represent constraints to good university governance (Birnbaum, 1988).

It is from this perspective that the third model of decision-making was developed, highlighting the limits of the collegial and bureaucratic models.

The political decision-making model

The political decision-making model developed by Baldridge (1971) overtly opposes the vision judged too idyllic of the collegial model, and refutes the idea of a possible fusion of the antagonistic individual interests in a shared consensus, based on common values and norms (Musselin, 2001). According to Baldridge (1971), each actor involved in the decision-making process has his own choices, his particular purposes and is constrained by various resources. This control, in the university organization, is unevenly distributed according to status and rank, hence the presence of alliances: bargaining, influencing, and coalition building to control them (Pusser and Ordorika, 2001). Therefore, tensions and conflicts, unimportant in both collegial and bureaucratic models, are here a central characteristic of the university life. In this context, the decision-making process becomes a system of bargaining and negotiation between several stakeholders (Baldridge, 1971). From this perspective, higher education organizations are seen as "composed of formal and informal groups competing for power over institutional processes and outcomes" (Pusser and Ordorika, 2001: 11).

One of the major limits of the political model resides in the fact that the 'better' decision cannot be chosen by the decision-makers. In addition, Hardy (1990) notices that the political model failed to account for the persistence of higher education organizations in the midst of continuous conflict.

The garbage can decision-making model

The last decision-making model we will look at in this section was developed taking into account all the characteristics of the three models previously described. In fact, the research of Cohen & March (two American scholars) and Olsen (a Norwegian scholar) gave birth to two notions (Cohen *et al.*, 1972):

1. The ***organized anarchy*** of which higher education establishments were a perfect example. This type of organization benefits from legal statutes, big traditions, stable environment, but its different components (departments, laboratories, individuals…) are generally very independent.
2. The second notion is the corresponding decision-making model to this organized anarchy: ***the garbage can model***. This model rejects theories where the decisions are taken following a linear process characterized by well identified objectives, available

solutions and their consequences (notably the bureaucratic model). It also rejects theories where decisions resulted from negotiation between groups having divergent interests (notably the political model).

In this model, decisions result from uncertain choices in a context characterized by ambiguity and contradictory interests. It is founded on the fortuitous character of the "meeting" between problems (in suspense that are unloaded by the participants as soon as they are generated); solutions (already elaborated) and more or less involved actors according to their resources and their temporal availabilities. This "meeting" can occur during a choice opportunity as contracts must be signed; people hired, promoted, or fired; money spent; and responsibilities allocated.

This stimulating and uncanny model gave a less rational and linear spark to the decision-making process (Pelletier, 2003). Notably, the "garbage can model" has the merit to not overestimate the rationality of the actors as well as their capacity to apprehend the process in which they intervene.

However, the important contribution of Cohen and his colleagues of combining the structural and human dynamics was highly criticized, probably because of the negative connotations that are associated with the term "garbage can".

To summarize, starting from the desire to find a universal model, scholars interested in university governance moved in two directions (Musselin, 2001). Some scholars argued that the academic organization can develop the four models and seek to qualify their establishments by using this typology (Birnbaum, 1988).

From another perspective, instead of distinguishing the establishments on the basis of models, other scholars reviewed the types of decision-making processes and showed that their collegial, bureaucratic, political or anarchistic characteristics depended primarily on the fields concerned (finances, pedagogy, research, etc.). According to this, the different models can coexist in the same establishment depending on the questions studied. In this setting, W. H. Taylor (1983), starting from a study of the University of Calgary, showed that some decisions are taken on the basis of the bureaucratic model while others are in conformity with the collegial model, the political model or with the garbage can model. The work of Ellström (1983) and Birnbaum (1988) embraced also this direction, the one we will adopt in our empirical investigation.

On the basis of this review of the literature, in order to identify how decisions can be taken in Tunisian public higher education, we synthesized the characteristics of each decision-making model by distinguishing them on the basis of six dimensions (table 1): "criteria used to make the decision", "approval of the decision", "basis of the decision-maker's power", "autonomy of the decision-maker", "mode of conflict resolution", and "acceptance of the decision".

TABLE 1
Distinction of the four decision-making models on the basis of six dimensions

	Collegial	**Bureaucratic**	**Politic**	**Garbage Can**

Criteria used to make the decision	In coherence with norms and values (Clark, 2001)	Oriented toward the reach of standardized objectives (Baldridge, 1971)	Protection of interests (Pusser, 2003)	Not well definite
Approval of the decision	Consensus (Waters, 1989) (Lazega, 2001)	Imposed by the hierarchy (Mintzberg, 1979)	Coalition Formation (Baldridge, 1971) (Pusser, 2003)	Flight or oversight (Cohen *et al*., 1972)
Basis of the decision-maker's power	Academic and professional expertise (expert power) (Hardy, 1996)	Hierarchic position (Merton, 1997) Authority power (Knobe, 1990)	Association with other actors: Referent Power (Baldridge, 1971)	Ambiguous (Ellström, 1983)
Autonomy of the decision-maker	Academic and professional freedom (Waters, 1989)	Standardized Instructions and rules (Mintzberg, 1979)	Capacity to influence others (McCarth, 2005)	Absence of constraints (Burt, 1992)
Mode of conflict resolution	Consensus Goodman (1962) (Lazega, 2001)	Authoritative relationship (Mintzberg, 1979)	Bargaining and negotiation (Pusser, 2003)	Groping (Pelletier, 2003) (Cohen *et al.*,1972)
Acceptation of the decision	Shared believes and values (Clark, 2001)	The legal rational/ domination (Weber, 1971)	Interest of actors coalition (Easton, 1993)	Hazard

University governance in Tunisia: Context of the study and conditions of investigation

The Tunisian university system is nowadays confronted with several challenges due notably to the explosion of both the number of students and the scientific knowledge that could be expected to continue during the following years.

As we have shown, higher education institutions are characterized by multitude levels of decision-making, mingling consensus, negotiation, bureaucratization and hazard. As a consequence, the decision-makers must take the appropriate decisions in order to answer the expectations of the plurality of actors constituting the university community. These conclusions made us think that it would be interesting to lead an empirical survey in the context of Tunisian public higher education. To do so, our investigation is divided into two steps.

Exploratory phase: a qualitative approach based on inductive analysis

In order to delineate more the context of our study, a qualitative approach based on inductive analysis seemed the most appropriate (Wacheux, 1996). This methodology is based on a

reasoning process in which researchers work on the basis of what emerges from the data in order to formulate hypotheses and eventually develop theories.

Since the investigation in the exploratory phase was qualitative, the focus for the sample size was not representativeness but instead to study in-depth some meaningful situations. Therefore, in 22 Tunisian public higher education establishments, we conducted 31 semi-structured interviews with 17 deans and directors for questions related to the pedagogic and scientific sectors, and 14 general secretaries for questions related to the managerial sector.

The analysis of these interviews was based on a method qualified as logico-semantics: the "content analysis methodology". This method, developed in the 1920s in the United States, enables the researcher to identify the most used keywords using the calculation of the frequencies of their occurrence (Kimberly & Neuendorf, 2002). Consequently, we will alternate in the presentation of our results between some statistics and hypotheses corresponding to every field of exploration.

First of all, in order to bring a global judgment about how decisions are taken (Taylor, 1983), especially in Tunisian public higher education establishments, we identified different types of decisions. Thus, we could distinguish between seven different decisions. In accordance with our research methodology (the content analysis), we undertook a classification of these decisions by grouping them in four categories: pedagogic decisions, scientific decisions, institutional management decisions and academic personnel decisions (see table 2).

TABLE 2
A typology of decisions can be taken in Tunisian public higher education

Pedagogic Decisions	Scientific Decisions	Institutional Management Decisions	Academic Personnel Decisions
Proposition of a curriculum Modification of a curriculum	Organization of conferences and Workshop	Preparation of the yearly calendar: Organization of exams Allocation and distribution of the budget	Need in teachers-researchers Teacher transfer

According to this typology, we were interested in the decisions which are problematic, in which a lot of time is spent in debate, in analysis, and in approval. Among these decisions, we first covered the decision related to the 'allocation and distribution of the budget'. In fact, more than three-quarters of the interviewees advanced that it is generally the financial aspects which were problematic and generated conflicts in most cases. These conflicts were usually resolved by a "standardized application of procedures and rules" which represented the basis of the 'leadership autonomy'. The preceding argument leads to the first hypothesis:

H1: Institutional management decisions, especially the allocation of the budget, are usually taken on the basis of bureaucratic model features.

The second type of decision which is difficult to make is the "academic personnel decisions", notably 'teacher transfers'. More than half of the interviewees signalled that the transfer of some teachers was problematic and that the deliberations of the "scientific council"[1] on this topic were relatively long and tiresome, due to the presence of relationships and alliances between members. We can now establish the following hypothesis:

H2: Academic personnel decision-making process has some features of the political model. In particular, the 'approval of the decision' based on the "formation of relationships and alliances" seems to be the most significant dimension of the decision-making process.

Quite the reverse, we note that pedagogic and scientific decisions are rarely mentioned as decisions that cause problems. More than two-thirds of the interviewees advanced that:

[1] In Tunisia, each higher education establishment is equipped with a council called "scientific council" composed of a president (dean or director), a secretary (general secretary of the establishment) and members (teachers elected among the academic personnel for a period of two years). This council examines all questions related to the organization and the function of the establishment, the proposals and modifications of the curriculum and proposes the creation of new departments. It examines each year, the budget of the establishment, after being informed of the implementation of the budget of the previous year.

H3: Pedagogic and scientific decisions are generally taken following a consensus, which is the main feature of the collegial decision-making model.

Finally, we will like to point out that most interviewees expressed their satisfaction vis-à-vis the workflow to the "scientific council". Usually, the session lasts between two to four hours, depending on the nature of the topics treated. In some establishments, especially the establishments of larger size (called 'faculty' in Tunisia), the sessions take longer than those in the establishments of smaller size ('institutes' or 'schools').

According to the answers of the interviewees, the difference between the types of establishments can be explained by two reasons:

- The number of council representatives in 'faculties' is more important than in 'institutes or schools'. Some deans advised that sometimes the size of the council may cause an obstacle for a good decision-making;
- Tensions between members are often a problem, notably in "faculties", due to their controversial points of views.

This result joins the assumption studied by Birnbaum (1991) in his book, *How Colleges Wor*k, by proposing "that good governance varies by institution and campus context. On a small campus, a collegium might be the best way to reach decisions effectively, whereas on a larger campus, a more political approach might be more effective" (cited in Kezar & Eckel, 2004: 383). In the context of Tunisian public higher education establishments, we can advance the following hypothesis:

H4: The way in which a decision is taken differs depending on the type of the establishment: 'faculty 'versus 'school/institute'.

Model and empirical strategy

The analyses which we carried out during our exploratory phase allowed us not only to undertake a qualitative analysis of the "inventory of fixture" but also to formulate hypotheses which must be validated. Subsequently, a questionnaire was developed in order to measure these hypotheses in all Tunisian public higher education establishments.

On the basis of the six dimensions characterizing the decision-making process and also the type of the establishment according to our findings in the exploratory phase, we tried to identify the dimensions which increase or decrease in a significant way the odds that the decision-making process related to a precise decision (pedagogic, scientific, institutional management, academic personnel) is collegial, political, bureaucratic or anarchical. We considered in this setting the decision-making process related to the four categories of decisions as the dependent variable. The independent variables are associated with features of the four decision-making models summarized in table 1.

To reach this objective, our questionnaire was administered to a random sample of around 50 establishments: 16 faculties (representing 61.54 percent of the global population) and 34 schools

or institutes (representing 38.2 percent of the total population) belonging to seven Tunisian universities.[2] It must be noted that we excluded the establishments created after 2005 and also the research and private establishments from our sample.

Considering the qualitative nature of the variables of our study, we have opted for a logistical regression, allowing us to predict the probability of an event's occurrence (called reference event) with regard to the complementary event, of the following form (DeMaris, 1992):

$$\log O_1^X = a + t_j^Y + t_k^Z + t_{jk}^{YZ} \quad (1)$$

With:

- $\log O_1^X$: is the logarithm of the odds to have the modality *1* of the dependant variable regarding the modality *2*.
- a : intercept which represents an effect of "general average" in the sense that it doesn't depend on modalities of the independent variables.
- t_j^Y : is the coefficient estimation of the *main effect* of the modality *j* of variable *Y* on the odds of the occurrence of modality *1* regarding the modality *2* of the dependant variable.
- t_k^Z : is the coefficient estimation of the *main effect* of the modality *k* of variable *Z* on the odds of the occurrence of modality *1* regarding the modality *2* of the dependant variable.
- And finally t_{jk}^{YZ} : represents the *interaction effect* between the two variables *Y* and *Z* on the odds of the occurrence of the modality *1* regarding the modality *2* of the dependant variable.

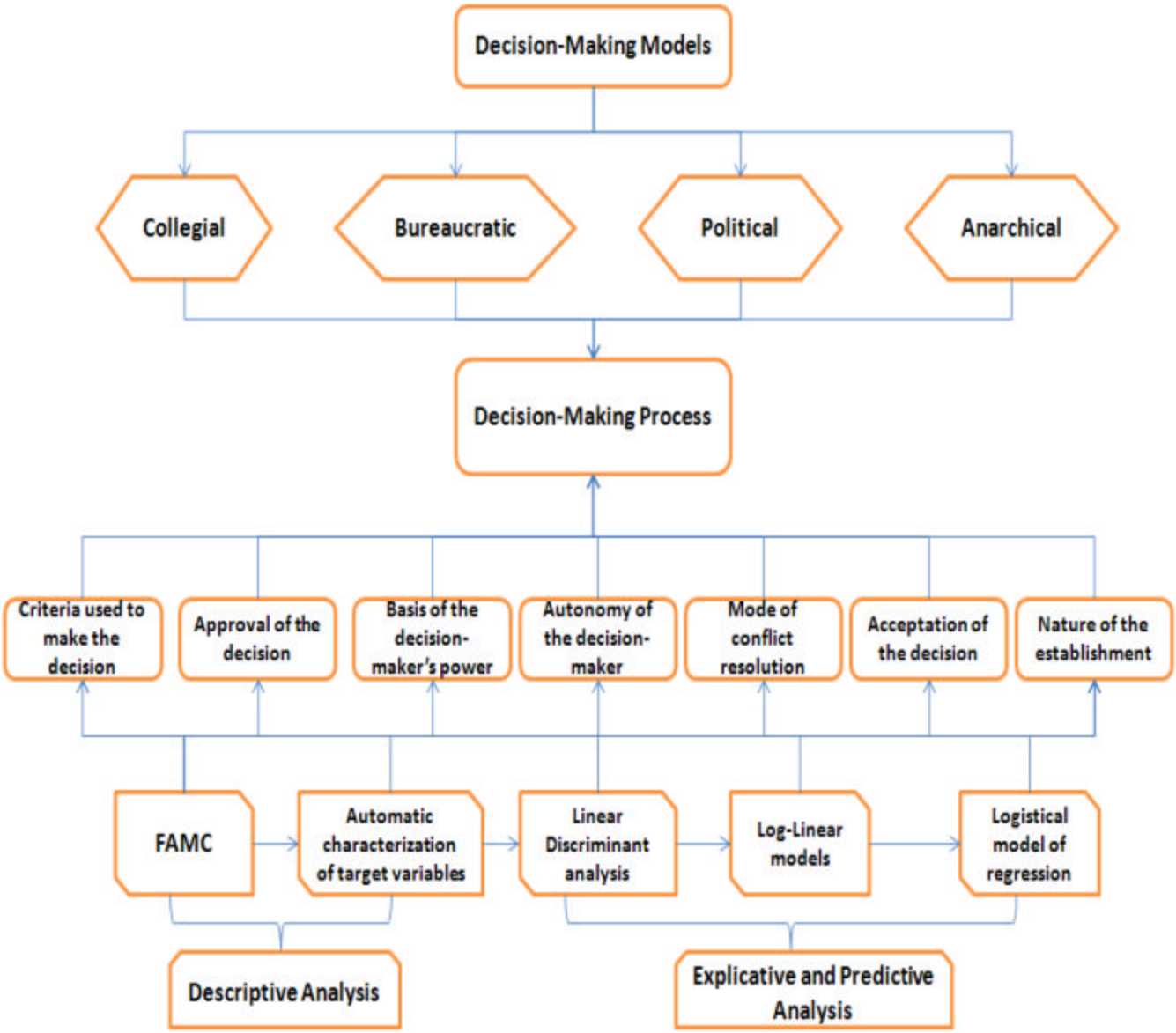
In other words, for each of the independent variables (*Y* and *Z*), we tried to express a measure of its influence on the occurrence of the corresponding event of the dependant variable (*X*). These influences are called main effects of variables, while the particular combinations of modalities of independent variables correspond to the interaction effects (DeMaris, 1992).

Empirical results and discussion

To answer our research question related to the identification of dimensions having a significant impact on the odds of having a collegial, bureaucratic, political or anarchic decision-making process, the dimensions characterizing the main decision-making models were screened in order to keep those playing a dominant role in determining the nature of decision-making in the end (figure 1).

[2] In Tunisia, the higher education establishments are under the supervision of a "university" enjoying the status of a public establishment, having an administrative character and reporting to the Ministry of Higher Education and Scientific Research.

FIGURE 1. Analysis diagram of statistical and econometric methods
A stepwise selection of variables



We take the ***pedagogic decisions*** as a reference point to explain the different steps permitting us to respond to our chosen hypotheses.

First of all, the factor analysis of multiple correspondences, as intermediate stage of calculation, permitted us to do a typology by regrouping the modalities of variables having the same behaviour. The results showed that for the pedagogic decisions, there is a contrast between the characteristics of the "collegial model" and the characteristics of the other three decision-making models (see table 3). This is reinforced by the 'univaried analysis' of each variable with a dominance of the characteristics of the collegial decision-making model. In order to refine the

analysis further, we distinguished between two groups of variables with two modalities: 'collegial' vs 'bureaucratic' (regrouping hence the modalities arising from the "political" and "garbage can" decision-making models).

TABLE 3
Description of the main factorial axes by modalities that contributed to their formation

Axes		Active Variables	Illustrative Variables
Axe 1	**Negative Pole**	- **Criteria** : Protection of interests - **Power** : Association with other actors - **Acceptation**: Interest of actors coalition - **Approval**: Coalition Formation	**Decision-Making Process** : Political Model
	Positive Pole	- **Approbation**: Consensus - **Power**: Academic and professional expertise - **Conflicts**: Consensus - **Criteria** : In coherence with norms and values - **Autonomy**: Academic and professional freedom	**Decision-Making Process** : Collegial Model
Axe 2	**Negative Pole**	- **Power** : Academic and professional expertise - **Autonomy**: Academic and professional freedom - **Acceptation :** Shared believes and values	**Nature of the Establishment:** Faculty
	Positive Pole	- **Power :** Hierarchic position - **Approval :** Imposed by the hierarchy - **Acceptation :** Hazard - **Acceptation :** The legal rational/ domination	**Nature of the Establishment**: School/Institute

On the basis of this result, we considered the dichotomy variable 'decision-making process' with two modalities as the variable to characterize, and the six dimensions (summarized in table 1) with notably the dimension "type of the establishment" as the characterized variables. The "automatic characterization of a nominal variable"[3] revealed that the three dimensions: 'approval of the decision', 'autonomy of the decision-maker', and 'mode of conflict resolution' represented the main significant variables of the collegial category of the decision-making process (see table 4).

[3] This procedure permits the characterization of a particular nominal variable by exploring automatically the set of links that it maintains with each variable of the investigation (SPAD Guide, 2001). The selection of the variables is based on the Pearson's chi-square ($\div^2$) test associated with the crossing of two variables.

TABLE 4
Characterization of categories by the modalities

Category: COLLEGIAL MODEL (Percentage: 50%)							
Variables	**Characteristics Modalities**	**% of the modality in the category**	**% of the modality in the sample**	**% of the category in the modality**	**V-Test**	**Prob**	**Weight**
Autonomy	**Academic freedom**	**64,00**	**32,00**	**100,00**	**4,93**	**0,000**	**16**
Conflicts	**Consensus**	**64,00**	**34,00**	**94,12**	**4,40**	**0,000**	**17**
Approval	**Consensus**	**72,00**	**52,00**	**69,23**	**2,57**	**0,005**	**26**
Criteria	In coherence with norms and values	72,00	54,00	66,67	2,29	0,011	27
Power	Academic expertise	68,00	50,00	68,00	2,28	0,011	25
Acceptation	Shared believes	44,00	28,00	78,57	2,23	0,013	14
Establishment nature	School/Institute	76,00	68,00	55,88	0,91	0,182	34

Thereafter, while being interested in the "linear discriminant function" (LDF) that Fisher reconstituted from the basis variables, we noticed that among the three dimensions, only two dimensions differed between the "collegial decision-making process (Dp)" and the "bureaucratic decision-making process": 'autonomy of the decision-maker (Au)' and 'mode of conflict resolution (Cf)' (see table 5).

TABLE 5
Characteristics of linear discriminant function

Variables	**Modalities**	**Coefficients of L.D.F**	**Regression Coefficients**	**Standard Deviation (regression)**	**Student Statistics (regression)**
Approval	Consensus	2,652700	0,588867	0,3445	1,7096
	Hierarchy	-2,873760	-0,637939	0,3732	1,7096
Autonomy	**Academic freedom**	**9,983480**	**2,216210**	**0,5696**	**3,8908**
	Standardized Instructions	**-4,698110**	**-1,042920**	**0,2680**	**3,8908**
Conflicts	**Consensus**	**4,318280**	**0,958606**	**0,5679**	**1,6881**
	Authoritative relationship	**-2,224570**	**-0,493827**	**0,2925**	**1,6881**
	Intercept	0,091142	0,020232		

On the basis of theses results, we can now analyze the variations of the variable "decision-making process" with two modalities in the setting of a logistical model which contain the estimated coefficients of the following equation:

$$\log O^{Dp}_{Collegial} = a + t^{Au}_{j} + t^{Cf}_{k} + t^{AuCf}_{jk}$$

We noticed that the values of the main effects and interactions, presented in table 6, are interpreted as the amount of increase (or decrease, if the sign of the coefficient is negative) in the predicted log odds that would be predicted by a one unit increase (or decrease) in the predictor, holding all other predictors constant. So, in our survey, a 'mode of conflict resolution' based on 'consensus' increases the log odds to have a "collegial decision-making process" by 1.5 while the contrary exists if the 'resolution of conflict' is "authoritative" and the log odds decreases by 1.5.

TABLE 6
Logit model of decision-making process: parameter estimates

				Additive	**Multiplicative**	**Standardized**
Intercept				0,1957	1,216	0,441
Main Effects	**Autonomy**	Academic freedom		0,1509	3,896	0,34
		Standardized instructions		-0,1509	1,163	-0,34
	Conflict	**consensus**		**1,5049**	**4,504**	**3,39**
		Authoritative relationship		**-1,5049**	**0,222**	**-3,39**
Interaction Effects	**autonomy*conflict**	Academic freedom	consensus	0,6334	1,884	1,426
			Authoritative relationship	-0,6334	0,531	-1,426
		Standardized instructions	consensus	-0,6334	0,531	-1,426
			Authoritative relationship	0,6334	1,884	1,426

We can also translate the results by the multiplicative expression of the estimated parameter. In fact, if the 'resolution of conflict' is based on 'consensus', it multiplies the odds to have a collegial process by 4.0, as we can see it in the second column of table 6, while the fact that the 'resolution of conflict is based on authoritative relationship' multiplies the odds by 0222 (reduction).

However, we notice that the main effect of the modalities of the variable "mode of conflict resolution" are more marked than those of the variable "autonomy of the decision-maker", which is confirmed by the analysis of the standardized values presented in the third column of table 6 (t-test statistically significant). We can conclude that this result confirms the hypothesis according to which the pedagogic decisions are generally taken following a consensus, the main feature of the collegial decision-making model **(H3).** Otherwise, this conclusion can be more interesting if we calculate the exact values of the odds and the odds ratio to have a "collegial

decision-making process" depending on the interaction between, one the one hand, the independent variables and the dependant variable and, one the other hand, the interaction between the independent variables. And so, the odds can be calculated by considering the exponential of the equation (1) for each cell of *j* and *k* modalities of the independent variables ('autonomy' and 'conflict'). For example, for the two modalities 'consensus' and 'academic freedom', we have:

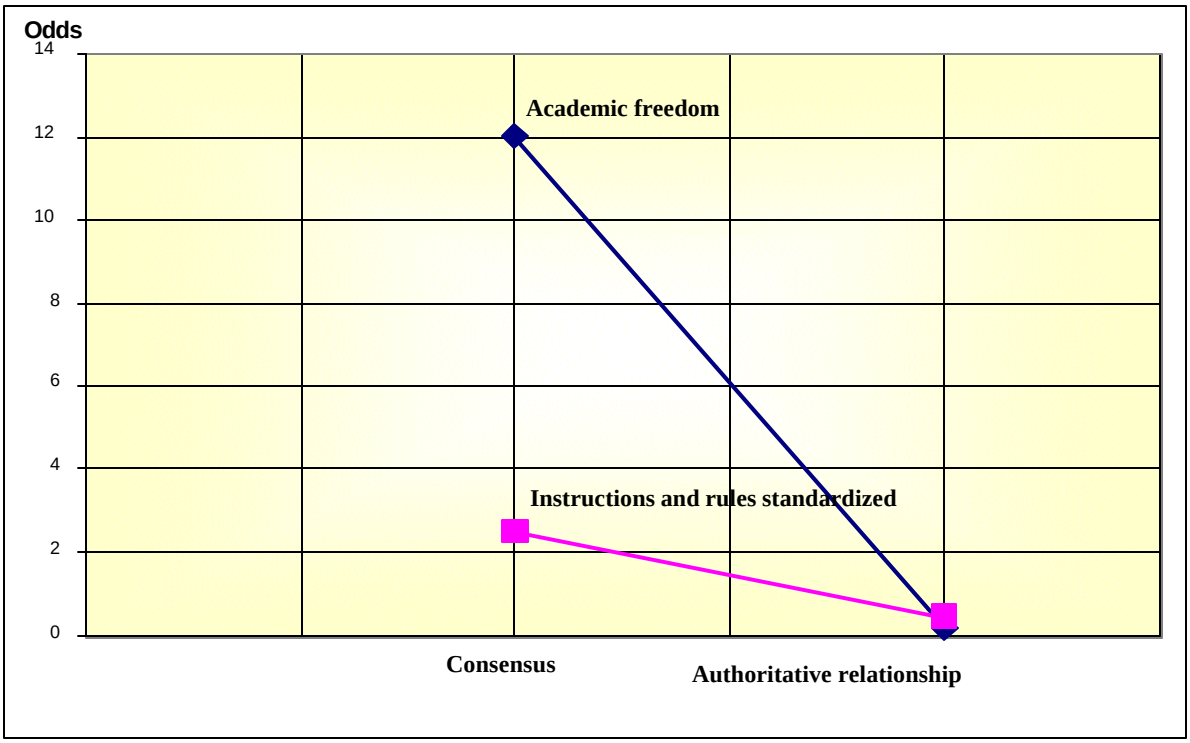
$$\log O_{Collegial}^{PD} = 0.1957 + 0.1509 + 1.5049 + 0.6334$$
$$\Rightarrow e^{2,4849} = 12$$

In a more general way, the odds provided in the first column of table 7 represent the odds to have a "collegial decision-making process" for a 'consensual mode of conflict resolution' according to the different modalities of the variable 'autonomy of the decision-makers'. According to the representation of Howell (1998), this result is illustrated in figure 2, which shows that the odds to have a "collegial decision-making process" for an autonomy based on the 'academic and professional freedom' is high if the resolution of conflict is based on the 'consensus' (odds=12).

TABLE 7
The odds to have collegial decision-making process

		Conflict	
		Consensus	Authoritative relationship
Autonomy	Academic freedom	12	0,167
	Standardized instructions	2,5	0,437

FIGURE 2. Odds to have a collegial decision-making process



Finally, the calculation of the odds ratio reveals that for a 'mode of conflict resolution' based on 'consensus', the odds that the "pedagogic decisions" are taken in a collegial way are more important for an 'autonomy' having rather collegial features than bureaucratic features. In a more general way, the establishments, in which the interaction between the different actors involved in the decision-making process for the pedagogic sector is based on "consensual mode of conflict resolution" and an "autonomy based on the academic and professional freedom", are **five times** more likely to have a "collegial decision-making process" than a "non collegial decision-making process". This probability decreases if the "mode of conflict resolution" is not collegial (see table 8).

TABLE 8
Odds ratio to have a collegial decision-making in relation to a bureaucratic decision-making

	Conflict	
Academic Freedom / Standardized instructions	Consensus	Authoritative relationship
Odds Ratio	4,800	0,381

Summary and future research

Since its independence in 1956, Tunisia has undertaken great efforts to anchor the society in the modern world. The accent is put on the development of its human resources (education, health, demography), on the intensification of its infrastructure and on the big deep and continuous reforms in the political, economic and socio-cultural fields (Zghal, 2002).

In our paper, we have made an attempt to analyze the way in which decisions are taken in Tunisian public higher education. As we have shown in table 1, several factors characterize the decision-making. Particularly, the interaction between the stakeholders involved in a decision-making process depends on seven dimensions: "criteria used to make the decision", "approval of the decision", "basis of the decision-maker's power", "autonomy of the decision-maker", "mode of conflict resolution", and "acceptance of the decision". However, the nature of the decision-making process depends on at least one of these dimensions but not necessary the whole. For this reason in our study, we tried to reveal which dimension(s) has (ve) a significant impact on the occurrence of one of the most well known decision-making models developed in the "university governance" literature (Kezar and Eckel 2004; Musselin 2001; Paradeise *et al*. 2009; Pusser 2003; Trakman 2008): collegial, political, bureaucratic or anarchical model.

In order to proceed, our investigation was based on some statistical methods related to qualitative variables allowing us to accept or to reject some hypotheses identified thanks to an inductive analysis in Tunisian public higher education institutions. We concluded that decisions are taken in different ways, depending on the field explored.

Table 9 represents a synthesis of the results obtained for the four categories of decisions identified in the exploratory phase. As we can see in this table, we followed the same methodology for the four types of decision in order to identify the factors which have a significant impact on the occurrence of one of the decision-making model. In other words, from descriptive statistical methods to explicative and predictive methods, the dimensions are screened in order to isolate those elements that have a significant impact on the decision-making process in the end.

TABLE 9
Stepwise selection of variables having a significant impact on the decision- making process

Analysis Type	Statistic Method	Pedagogic Decisions	Scientific Decisions	Decisions relating to institutional management	Decisions relating to teaching staff
Exploratory and Descriptive Analyses	***Factorial analysis***	Distinction between variables on the base of two modalities: Collegiality vs Bureaucracy	Distinction between variables on the base of two modalities: Collegiality vs Bureaucracy	Distinction between variables on the base of two modalities: Bureaucracy vs Collegiality	Distinction between variables on the base of two modalities: Politic vs Bureaucracy
	Automatic characterization of a nominal variable	Approval of the decision Autonomy of the decision maker Conflict resolution	Criteria used to take the decision Basis of the decision maker power Approval of the decision Autonomy Conflict resolution Acceptation	Basis of the decision maker power Autonomy of the decision maker Conflict resolution Decision acceptation	Criteria used to take the decision Approval of the decision Basis of the decision maker power Establishment nature
Explicative and Predictive Analysis	***Discriminative factorial analysis***	Autonomy of the decision maker Conflict resolution	Criteria used to take the decision Autonomy of the decision maker Conflict resolution	Basis of the decision maker power Autonomy of the decision maker	Approval of the decision Establishment nature
	Log-linear analysis	Autonomy of the decision maker Conflict resolution	Autonomy of the decision maker Conflict resolution	Basis of the decision maker power Autonomy of the decision maker	Approval of the decision Establishment nature
	Logistic analysis	Conflict resolution	Autonomy of the decision maker Conflict resolution	Autonomy of the decision maker	Approval of the decision Establishment nature
		Main effect	**Main effect**	**Main effect**	**Interaction effect**

We noticed that the "scientific decisions", taking into account an autonomy based on 'academic and professional freedom' in comparison with an autonomy based on the 'standardized application of rules and directives", are more likely to have a "collegial decision-making process" than a bureaucratic one when the 'mode of conflict resolution' is based on "consensus". This result leads us to accept hypothesis ***H3.***

However, "decisions related to institutional management" follow a process with bureaucratic dominance when the autonomy of the decision-makers is based on the 'standardized application of rules and prescribed norms' rather than on 'academic and professional freedom', allowing us to accept hypothesis ***H1.***

Finally, the faculties, in which the interaction between the different actors involved in the decision-making process for the "academic personnel sector" is based on 'coalition formation', are more likely to have a "political decision-making process" than a "non political decision-

making process". This likelihood decreases if the establishment is not a 'faculty'. This result confirms not only the hypothesis ***H2*** but also the hypothesis ***H4*** which considers *the way in which a decision is taken differs according to the type of the establishment: 'faculty' versus 'school/institute'.*

As a conclusion, the results found in the second phase of our study confirm in large measure the hypothesis enunciated in the exploratory phase. This conclusion can help the university leadership to identify which factors impact the way in which decisions are taken in order to improve the governance of the higher education establishments. As we have shown, a single model can't be helpful for understanding governance in the establishment of higher education. The decision-making process varies from campus to campus and on the same campus, it depends on the field explored. This conclusion joins Birnbaum's works which stipulate that cultural theories in the local context, history and values override generalized strategies for improving governance. As future work, we can study in-depth the cultural dimension and the specificity of each establishment and their impact on the way in which decisions can be taken in the public higher education establishments.

Islem Khefacha is assistant professor in the Faculty of Economics Sciences and Management of Mahdia and member of the research unit "Quantitative Finance". University governance and decision-making models are at the centre of his research, notably in Tunisian public higher education establishments. Lotfi Belkacem is a professor in the Institute of the High Commercial Studies of Sousse since the academic year 1994/1995. His research interests are based on the "quantitative management", especially in the areas of businesses management and entrepreneurship. He is also head of the research unit "Quantitative Finance" and a GEM Tunisia Team Member.

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