

The validation of the procedure of regulation construct using the confirmatory factor analysis

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Abstract—

The role of the procedure of regulation has widely been discussed in the literature. Most studies have examined the components of the procedure of regulation and their associations in the internal management of the organization, and have also investigated certain objectives of regulation; like the one related to results achievement. However, very few applications have been carried to develop and validate the measurement of the procedure of regulation construct. Four dimensions of procedure of regulation are identified in the literature. These dimensions constitute the procedure of regulation factors. After using some approaches, a measure to build in 13 items is validated. The theoretical and methodological issues related to the application of the procedure of regulation construct are discussed in the light of these results.

Keywords—

procedure of regulation; component; measurement; principal component analysis; confirmatory factor analysis.

I. INTRODUCTION

The literature on the procedure of regulation in the context of organizations is long standing. Indeed, the organization's viability must confirm some compliance with the objectives. The procedure of regulation ensures the control of the execution, the assessment of individual contributions and the organizational regulation indicators, which are indicators of performance [1]. However, there is little empirical evidence in terms of validation of the scale of the adjustment of the procedure of regulation. Authors like [2, 3, 4 and 5] correspond to the provision specifying the components of the regulation of the system. The scales used in this context of the measurement of the procedure of regulation often adopt one component of the procedure of regulation such as subjective or economic indicators [6], or management control indicators [7], or efficacy and efficiency indicators [8].

In addition, a major interest in the literature is to investigate the characteristics of the procedure of regulation and its components. The aim of our research is to develop a procedure of regulation construct and evaluate its validity and reliability. Confirmatory factor analysis is performed using the AMOS4.0 to verify the construct and identify the model.

II. THE THEORETICAL DEVELOPMENT OF THE PROCEDURE OF REGULATION CONSTRUCT

The procedure of regulation can be presented in different forms; such as regulatory outcomes, behaviors, tasks, activities, strategy or values [1, 9, 10 and 11]. The importance of different dimensions is emphasized by a variety of authors – Tabatoni and Jarinou (1975) involve organizational effectiveness, personal effectiveness and organizational environment. Laflamme (1981) takes into account the implementation of standards and behavior of staff; and Livian (2005) presents the regulation by controlling the execution of rules and conformity standards.

Various researches pinpoint three main key areas that determine the procedure of regulation. These areas have been identified in the theoretical studies of Frioui (2006) who composed the procedure of regulation by the achieved results, the provided effort and the adopted behavior.

According to this perspective, we define the procedure of regulation as “a statement that determines the internal control activities by taking a relation of the results to be accomplished, the effort to be provided for the execution and the behavior to be adjusted in relation to objectives.”

A. *Evaluating results*

The internal evaluation of the results is paramount in the context of measurement of any procedure of regulation. Often understood as the raison of any organization, the results are guarantees of the effectiveness, efficiency and relevance. Thus, an organization that has powerful aims must necessarily enhance the results [12 and 4].

B. *Evaluating effort*

Often depicted as the heart of organizational performance, the effort is a demonstration to achieve the objectives in results [13]. Thus, the evaluation of these actions is a key determinant of performance

measurement and a component of the procedure of regulation.

C. *Evaluating behavior*

Behavior, as a result of attitudes, reflects the objectives and provides a diagram of the inner workings of any organization [2, 14, 15 and 16]. There is also ability in the literature to implement various views of the regulation of behavior.

For example, Bédard and Miller (1995) integrate motivation, Bouquin (2004) values the orientation behavior, Godet (1997) focuses on attitudes toward the future, Paillé (2006) opts for citizenship behaviors, and Frioui (2006) adopts the nature of the adopted behavior. Empirical studies on the regulation procedure are very limited [17]. Most authors do not necessarily consider the regulation procedure as built components while others include items relating to each component.

We suggest the following hypotheses:

H1. Although the built up of the procedure of regulation is conceptualized as consisting of separate components (evaluation of the results, the effort and the behavior), the covariance between items can be addressed by a single factor.

H2. The items of the procedure of regulation reflect the independent factors.

H3. Covariance among the items can be represented by a combination of factors, wherein each factor represents a particular conceptual component of the procedure of regulation and each element was reflected only by one component. The factors are correlated.

III. RESEARCH METHODOLOGY

A. *Sample and method of data collection*

A total of 20 items has been generated from the literature. A questionnaire is used to collect

empirical data. The questionnaire uses a Likert scale graded 5 ranging from 1: Strongly Agree, 2: Agree, 3: Partially agree, 4 Disagree and 5: Not at all agree.

A sample of 400 companies, seated in Tunisia, is cut at random from the promotion of Industry and Innovation Agency database. Only 256 managers agreed to meet us, which represents a response rate of 64%. The administration of the questionnaire is to direct 218 companies, which gives a direct maintenance rate of 85%.

B. Method of analysis

After securing the principal component analysis (PCA) of the pre- test with 110 companies, we performed a second PCR with a sample of 256 companies. We were able to extract four factors regulating the procedure: the tangible results, the intangible results, the effort, and the behavior. Confirmatory factor analysis with three models of procedure of regulation has allowed us to reach an acceptable model.

IV. DATA ANALYSIS

A. Principal component analysis

A first factor principal component analysis performed on the sample of pre-test of the structure radiates a control procedure with six factors that explain 75 % of the total variance. Examination of commonality and loading shows that two items have low communalities, therefore, we decided to eliminate them.

In the second analysis with the second sample, three items have bad communalities (< 0.5). Thus, the final structure of the procedure of regulation is formed by fifteen items and defined by four factors with a percentage of 67.37 % of total variance and the reliability of each of which is greater than 0.7 .

B. Confirmatory factor analysis

After setting the items that constitute the structure of the procedure of regulation, we have compared three models of the process control: a constructed model is without factors, a model whose factors are independent and another whose factors are correlated [18].

Early estimates show that the elimination of two items significantly improves the goodness of fit. The structure of the procedure of regulation is now defined by 13 items.

Model 1, which defines the structure of all items, has the worst indices. These indices indicate that the model should be revised to be better adapted to the sample data.

The second model considers that the dimensions are independent and each of which was defined by a set of items improves the fit indices. Some evidence does not meet the specified thresholds.

A third model presents the correlate factors structure of the procedure of regulation. The adjustment indices are good.

We can say that the structure of the procedure of regulation is a multidimensional one. The items of the regulation procedure have a structure of four basic and interrelated factors: tangible results, intangible results, effort, and behavior (Model 3). Thus H3 is validated.

C. Validity and Reliability

Several efforts have been adopted to maximize the reliability of the validation and the constructed procedure of regulation:

- The use of a set of items to measure the construct.
- The use of measuring elements that have been empirically tested in other works.

- The construction of new components based on the theoretical approach. Each component has been the subject of detailed and relevant studies in the context of the construction of the built process control in order to maximize the construct validity.

- Confirmatory factor analysis is used to verify that each item is assigned to a single dimension of the construct of the control procedure without correlation with other dimensions.

- The choice of the measurement model of the process control is the model the dimensions of which are correlated.

To check the reliability of internal consistency, we performed Cronbach's alpha and Rho of Joreskog tests [19].

Convergent validity is verified by checking that the CR which is greater than 1.96. Similarly, no structural link is above average variance factors. And discriminate Validity is checked according to Fornell and Larcker (1981) [21].

V. DISCUSSION AND CONCLUSION

The procedure of regulation developed in this paper takes a step forward towards the effective measurement of organizational performance. The significance is primarily thrice. Firstly, from the majority of the existing researches that focus on one or two aspects of the regulating procedure the construction of the structure of this construct captures the main elements of the regulation by the results, and takes into account the efforts and the assigned behaviors for the achievement of these results. Secondly, the project to build a structure of regulation procedure integrates the strategic orientation of the organization as a key performance factor of internal control.

What distinguishes this structure from most existing works is that it measures the procedure of regulation by a set of items. Another feature of our construct is the unveiling a procedure of regulation

by four component factors. This provides a thorough assessment. Despite these contributions, several theoretical and methodological issues still concern the application of the measure of the construct.

Theoretical questions

To put it more technical words, the advantage of using a procedure of regulation constructed from a set of components can be shown in three aspects. First, the procedure of regulation is represented by certain combined features, which allows a much better specification of the quantization of this concept instead of indicating or not the existence of a regulation in the frame of an organization.

Second, the regulation, as a scope, can be built to cover the various key aspects of performance. It is careful to provide a multidimensional measure, which is more reliable to measure the regulation procedure rather than screen the performance of an organization with one or two aspects of the regulation. Finally, measures of control procedure mention the capacities of an organization in terms of control in order to ensure an effective control at the level of results and the manner of execution and the way to achieve the results in question. Thus, measuring the adjustment procedure is not only a measure of regulation results to be achieved, but also prescribes the underlying elements of the climate for achieving results. That is the effort the behavior used. In fact, our four constituent factors provide opportunities to use each of them independently. The validity and reliability of each factor are tested and confirmed in the analytical section.

Methodological issues

Our starting assumptions are rejected because it was necessary to review the number of items (in the beginning, we have 20 items reduced to 15 in the PCA and 13 items are tested in the confirmatory factor analysis items). Moreover, taking into consideration the multidimensional nature of the results to be achieved, the composition of the

procedure of regulation is of four factors. The three hypotheses are developed on the basis of the covariance and correlation between the items. The final model presents evidences of acceptable fits. In addition, both the convergent and discriminate are confirmed in this study.

The development and validity of scales require new tests and repetitions [22]. Our structure of the built up procedure of regulation is the first test and should be subject to further research. A recommendation would be to test the causal relationships between the procedure of regulation and other organizational settings. By doing this, the predicative validity can still be tested.

In conclusion, the objective of this study is to develop a measure for the regulation procedure. Although a further work is crucial, especially in the methodological field, the results are tantalizing. They provide a basic framework, and combined with the above recommendations, they will clear a path for further studies.

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