Management Control Performance in Moroccan Public Equities

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Abstract
The objective of this scientific contribution was to validate our reticular meta-model of Performance of Management Control (PCDG) and its expanded influence on Social and Environmental Performance (PSE). To achieve this objective, we were able to propose to analyze and measure the performance of public equities by the Method of Structural Equations (MES) in order to validate the meta-model of the Performance of Management Control (PCDG) and its broader influence on Social and Environmental Performance (PSE) as well as the underlying assumptions on which our research is based. In this context, our model has been tested with 44 public equities in Morocco. The predictive vocation of our model, its structural relations and the reflective nature of our constructs led us to retain the Partial Least Squares (PLS) method in order to validate our meta-model of research. Finally, from this empirical tool, it was possible to explain a meta-model of the management of the decision-making management 2.0 of the public equities of Casablanca Stock Exchange and its multiple positive externalities : Relevancy, Utility, Economy, Efficiency and Effectiveness. The various tests carried out rigorously, through the longitudinal survey conducted with Moroccan public equities, relevance and robustness of the Methods and Meta-models of Performance Steering.
Keywords: Management Control - Management Control Decision 2.0 – Sustainable Development – Social and Environmental Responsibility (CSR) – Methods and Meta-Models – Performance Steering – Performativity - Public Equities – Casablanca Stock Exchange (BVC) – Relevancy – Utility - Economy – Efficiency – Effectiveness – Management Control Performance – Social and Environmental Performance –Moroccan All Shares Index.

Introduction
The approach of this action research underlying the vernacular problem « best practices of the Moroccan All Shares Index (MASI) Management Control » will follow a readable strategy, with a rigorous calendar spread over five (5) years « confers to the scheduling scheme Of works from 2008 to 2014 » and significant spin-offs previously clarified. It must be recognized that this action research will aim to highlight the action levers of the best practices of the Management Control of Moroccan Enterprises listed on the Casablanca Stock Exchange (BVC)[1] configuring the Moroccan All Shares Index (MASI) in a subprime crisis[2].

The quantitative empirical tests will deal with the action variables of the Best Practices in the Management Control of Moroccan Companies registered on the Casablanca Stock Exchange (BVC) by means of a survey with 44 of the largest Stocks Capitalization (CB). We will explain how the Moroccan public equities will implement and deploy budgetary « Business Models » declined by Management Control during a period of subprimes economic crisis. This article will highlight the quantitative study through the empirical tests of Sustainable Development and Social and Environmental Responsibility (CSR) underlying Decision-Management Control 2.0.

We will present the results of the study of the integrated performance carried out by the structural equations « Partial Least Square (PLS) ». The first axis will propose an analysis of the objectives of the Method of Structural Equations (MES) in the context of Moroccan public equities (Axis 1). The second point will continue this analysis by highlighting the performance measure of our meta-model: methodology adopted and discussions (Axis 2). Finally, we will discuss the results of this quantitative research in terms of the assumptions test of the structural model and the results of the confirmatory analysis.

I. Conceptual model and operationalization the concepts of the research model
The objective of our research is to present as faithfully the steps of the process of measuring the dimensions of the concepts of our research, their validity of constructed, convergent and discriminating, their reliability as a measure and as well as their coherence.

Econometric conformism will consist in presenting the conditions of control and, if necessary, the factors to rule out the effect in order to better appreciate the causal links between the concepts of our research model. The choice of these factors will be based, in view of the requirements of this conformism, on theories and theoretical

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[1] LOUTFI, Touda. *Communication et rôle de la Bourse des Valeurs de Casablanca dans le développement des marchés financiers*. p. 31-37.
[2] ARTUS, Patrick ; BETBEZE, Jean-Paul et al. *La crise des subprimes.* p. 106.

models dealing with the determinants of performance of the Management Control of Moroccan public equities influencing the Social and Environmental Performance (PSE) of the companies listed on the Casablanca Stock Exchange (BVC).

Thus, by way of example, we will base our arguments on neo-institutionalist approaches on the justification of their arguments and on the assumptions underlying them about the characteristics of the listed companies and, where appropriate, Casablanca Stock Exchange (BVC). The plasticity at the level of the specification of the econometric model will undoubtedly be inevitable in view of the contextual and substantive nature of the theoretical approaches studying the determinants of the Management Control Performance (PCDG) and the impact on Social and Environmental Performance (PSE). If necessary, we will focus on the contributions of our early access to the field and, in this case, the results of our direct interviews with specialists in the field of Management Control.

We try to test the following assumptions in the context of our research meta-model :

- **General Assumption (HG)** : The Social and Environmental Performance (PSE) is influenced by Management Control Performance (PCDG).

The General Hypothesis will give rise to two adjacent assumptions corresponding to the variables of the Performance of the Management Control (PCDG) and the Social and Environmental Performance (PSE).

- **Adjacent Assumption n°1 (HA1_PCDG)** : The Performance of Management Control is influenced by the perceived performance of the composition of the dashboards by indicator on the objectives and actions carried out, the long-term objectives (dated and quantified), the administrative procedures manual, the organization of the dashboards by project, by actions plan and long-term strategic plan.
- **Adjacent Assumption n°2 (HA2_PSE)** : The Social and Environmental Performance is influenced by the organization of « public equities » in board of directors with CEO, certification 14 000 or 22 000 and certification in the context of Total Quality Management.

The first Adjacent Assumption HA1_PCDG will give rise to five direct Dependency Assumptions between the variables of Management Control Performance.

- **Direct Dependency Assumption n°1 (H1_1_ CTBIOAM)** : The composition of the dashboards by indicator on the objectives and the actions carried out positively influences the Management Control Performance.
- **Direct Dependency Assumption n°2 (H1_2_OLT)** : The integration of long-term objectives (dated and quantified) positively influences the Performance of Management Control (PCDG)
- **Direct Dependency Assumption n°3 (H1_3_MPA)** : The implementation and the deployment of a manual of administrative procedures positively influences the Management Control Performance.
- **Direct Dependency Assumption n°4 (H1_4_OTBPPA)** : The organization of dashboards by project, by action plan, positively influences the Management Control Performance (PCDG).
- **Direct Dependency Assumption n°5 (H1_5_PS)** : The implementation of a long-term strategic plan has a positive effect on the Management Control Performance (PCDG).

The second Adjacent Assumption HA2_PES will give rise to three direct Dependency Assumptions between the variables of Management Control Performance.

- **Direct Dependency Assumption n°1 (H2_1_CAPDG)** : The existence of a Board of Directors led by Chief Executive Officer (CEO) has a negative effect on Social and Environmental Performance (PSE).
- **Direct Dependency Assumption n°2 (H2_2_C1422)** : The implementation of a 14 000 or 22 000 standard certification in the public equities has a positive effect on the Social and Environmental Performance (PSE).
- **Direct Dependency Assumption n°3 (H2_3_TQM)** : The existence of a Total Quality Management approach has a positive effect on Social and Environmental Performance (PSE).

The interest for our research is to understand the measurement of the Management Control Performance. This measure will be made particularly difficult by the new challenges of the public equities environment and the strategic and managerial resilience. Thus, our central question of our research was formulated in the following way:

« **Is the Management Control Performance a determining factor in the Social and Environmental Performance of moroccan public equities ?** ».

To test our conceptual meta-model conceived by an abductive approach, we move from the theoretical world to the empirical world. This transition, which is not devoid of methodological pitfalls, requires a vigilance in choosing the right proxies to identify the main facets or dimensions of the concepts mobilized in our research model, as well as to test their interactions. For this purpose, we split this axis into two essential points. The first one highlights the methodology for testing the validity and reliability of the operationalization variables. In a second point, we consolidate the choice of methodology to test the validity and reliability of the operationalization variables of our meta-model.

I.1 Methodological Objectives of the Structural Equations Method

The Structural Equations Models (SEM) are now widely used in quantitative research in management sciences when it comes to testing complex causal models, incorporating several latent variables. The usual estimation procedure is based on techniques for analyzing the covariance relations between the variables, implemented in the software commonly used in data processing from empirical studies (for example : Partial Least Square « PLS »).

The Structural Equation Methods (SEM) have been developed to test multiple causal relationships, then their use has gradually been extended to latency construct validity analyzes (confirmatory factor analysis) and then to multi-group analyzes (for example : Ping, 1995 ; El Akremi, 2005) and to longitudinal studies (for example : Vandenberg, 2002 ; Campoy & Dumas, 2005).

In the framework of the estimation of theoretical relational models, the main contribution of these methods is to allow a simultaneous estimation of several dependency relations, while taking into account the measurement errors (Roussel & al, 2002). A model of structural equations (Cf. Figure below) traditionally consists of two parts: the measurement model and the structural model (Lacroux, 2009).

The specification of the model to be studied consists in specifying its main characteristics on the basis of the theory. Indeed, the presence of a conceptual framework coherent with the model forms a preliminary ingredient allowing the theoretical justification of the linear relations to be tested (Roussel et al, 2002).

On the one hand, it consists in determining the measurement model of the latent variables by answering the following questions :
- What indicators are used to measure latent variables?
- How are they related to latent variables and possibly to other indicators?

The specification also consists in determining the structural model by answering the questions :
- What linear relationships need to be tested between latent variables?
- What is their direction and nature?
- What are my different parameters to estimate?

Baumgartner and Homburg (1996) have indicated that the consideration of a certain number of observed variables for each latent variable (or dimension) serves more to specify the measurement model. These authors suggest that a minimum of three to four measurement indicators per dimension is relatively favorable for a measurement model.

In particular, we distinguish reflective indicators and formative measurement indicators. The review of the literature in Management Control notes that most models are of a reflexive nature. Thus, each model tested is divided into two parts: the measurement model and the structural model (Cf. Figure below). The first model specifies the indicators (observed variables) of each latent variable. Each indicator is defined theoretically by the designer of the analysis model or by taking again the factorial structure of the scale which appears after an exploratory factor analysis. The second model concerns the assumptions of linear relations between the latent variables and corresponds to the relations defined a priori by the designer of the model.

Estimating models, in other words, establishing the links between the indicators and associated latent constructs (measurement model), as well as the calculation of the structural coefficients between the constructs (structural model), can be done by using several types of algorithms. Two methods are now used in the field of management sciences (Chinn, 1995) : the most common method is based on the analysis of covariances (CBSEM) and the technique of maximum likelihood, often referred to as « Lisrel method », with reference to the main software tool developed on this basis (Jöreskog & Sörbom, 1996). We also find in some studies an alternative method based on the analysis of variance (VBSEM) and optimization of the explanatory power of the indicators, based on a so-called Partial least Square (PLS) algorithm.

According to Chinn (1995), it is possible to distinguish the two methods by analogy with factor analysis. The difference between the Lisrel (CBSEM) and Partial Least Square (VBSEM) approach is similar to that between the « classical » in factor analysis of common and specific factors and the Principal Component Analysis (PCA). The second does not take into account measurement errors, but it still allows a solution to be obtained.

The Partial least Square (PLS) method is still a minority in management sciences, but it should be noted that it is very commonly used in other disciplinary fields, sometimes connected to management (economics, sociology or psychology, for example). If one considers more precisely the field of management sciences, it can be seen that studies incorporating models estimated by Partial Least Square (PLS) analysis are today mainly used in strategic management (for example: Venaik et al., 2005), information systems (for example: Chin & al., 1996). We can mention the researchs on psychological support or work-family conflict can be mentioned (Duxbury & Higgins, 1991). The following table, (Jöreskog & Wold, 1982 ; Chinn, 1995 ; Haenlein & Kaplan, 2004)) summarizes the different features and uses of the Lisrel and PLS approaches. It is an aid to decision making when choosing a suitable estimation method (Lacroux, 2009).

Table 1: Comparison of Lisrel versus PLS approaches

PLS (VBSEM)	Lisrel (CBSEM)
Method adapted to nominal variables (interval or continuous)	All variables must in principle be continuous or interval, and normally distributed (multinormality condition), to use the algorithms based on the maximum likelihood
Well adapted to exploratory type analyzes, or to the testing of partial models	Well adapted to the test of complete models, based on a firmly established theory
Compatible with small samples and with complex relational models	Requires medium size samples (200 observations minimum)
A flexible method for testing models with formative and reflective variables	Formative / reflexive models are identifiable (and testable) only if they have certain characteristics
Measurement models and structural model are estimated simultaneously (the links between indicators and latent variables depend on the relationships between latent variables)	The estimation and validation of the measurement model are independent of that of the structural model
Reserved for the test of recursive models (the causality between the latent variables must be univocal)	Allows testing of recursive and non-recursive models

By way of summary, the use of the Partial least Square method (PLS) seems well adapted to the problems encountered in Management Sciences. That said, as noted by Sosik & al (2009, p. 17) : « *The PLS method works better in practice because the field data used in modeling are never perfect, and are often highly correlated. By selecting the best linear combination to predict the dependent variables, it provides more significant structural coefficients than the maximum likelihood (Lisrel) methods. Lisrel methods work best when the data are obtained using experimental design: however, this type of design is rarely possible in practice, especially when the data are obtained by questionnaire* » (translated).

I.2 Methodology for testing the validity and reliability of operationalization variables
Our objective here is to present as faithfully the steps of the process of measuring the dimensions of concepts, their constructive, convergent and discriminant validity, their reliability as a measure and as a concept, and their consistency.

The validity can be defined as the degree to which a scale perfectly measures the constructed structure (McDonald, 1999). To qualify a valid scale, one must ensure that five types of validity are met: content validity, facial validity, construction validity, nomological validity and criterion validity. Content validity and facial validity are not based on a formal indicator but on an examination of the underlying theory and a critical review of the constructed by experts. Only the last three dimensions of a scale's validity use statistical validation criteria. However, in social sciences, the construct validity is the most tested (Jolibert and Jordan, 2009, 197). Indeed, the validity of a constructor seeks to ensure that the instrument measures perfectly and only the construct considered. The scale must measure only one built, independently of other constructs to which it can, if necessary (and only when the theory justifies it) be correlated. The validity of construct decomposes into convergent validity and discriminant validity. These two types of validity that will be studied in this research.

A scale has a good convergent validity when several measurements of the same construct are sufficiently strongly correlated with one another. It is a matter of seeing whether two measures of the same concept realized by two different methods are convergent. The convergent validity is verified when two different measures of the same concept are strongly correlated.

In other words, the measurement items of a phenomenon are strongly correlated with each other (Baumard and al., 2003). The correlation between items is thus a necessary and sufficient condition for a positive opinion on convergent validity (Igalens and Roussel, 1998, Evrard et al., 2009). In a first step, this is verified by the matrix of correlations between the attributes of a construct. This makes it possible to retain the most significant items and to eliminate those that have a weak correlation. In a second step, the principal component factor analysis is used to verify that the items of the constructs to be measured contribute significantly to the formation or formation of a single main component and / or to the structuring of all Variables according to certain grouping themes called dimensions or factors

The discriminant validity applies only to constructs of the same conceptual level. A scale has good discriminating validity when different measurements of the construct have sufficiently weak correlations with distinct constructs (Jolibert and Jordan, 2009: 186). This validity makes it possible to discriminate phenomena or constructs between them. In other words, items measuring different concepts or constructs are weakly correlated

(Baumard and al., 2003). This validity is also verified by the analysis of the correlation matrix and Factor Analysis in Principal Components (FAPC), in order to examine that the items of a constructed this one and not of others constructed. To confirm this discriminating validity of the scales, Factor Analysis in Principal Components (FAPC) must normally restore as many principal components as there are variables and each attribute must have a high contribution in a factor of its own (for be retained). The convergent and / or discriminant validity test is usually carried out either by the multitrack-multimethod matrix, or by a Factor Analysis in Principal Components (FAPC) (Nunnally, 1978, Campbell and Fiske, 1959). The choice in this study is based on the Factor Analysis in Principal Components (FAPC) to check the validity of constructed. Once our scales are purified and have good reliability and good convergent and discriminant validity, we will analyze each item using descriptive statistics (mean, frequency ...) before testing our model and the assumptions on which it is based on structural equations.

Once the weights have been properly identified in the matrix, the structure of the factors is established from the variables that have a significant weight inside the column of each. Using the questionnaire and the exact wording of the items, one must look at the associated variables and try to name the latent construct measured by the factor.

The ultimate goal of Confirmatory Factor Analysis (CFA) is to construct scales that will measure latent constructs. These scales are obtained by adding the results of the participants to all the variables that make up each factor. A scale must include at least three variables. The analysis of the quality of representation of the variables making it possible to measure each variable (item) restored by the selected factors. Empirical thresholds are set below which items are considered to have a mediocre representation (Philippeau, 1986 and Roussel, 2005, p.264). They should preferably be eliminated. An item variance explained by the selected factors greater than 0.80 indicates that the statements are very well represented. They are good when the variance is between 0.65 and 0.80. They are moderately when it is between 0.40 and 0.65. Finally, they are mediocrely below 0.40 and should be eliminated. Other priority arguments may nevertheless lead to maintaining some of these items, for example the need to retain them sufficiently to represent a facet of a variable or not to impair the validity of the contents of the scale (Roussel, 2005, p. 264). The interpretation of a factor (and the name given to it) depends on the analysis (Jolibert and Jordan, 2009, p. 316). Once these items have been eliminated, Principal Component Analysis will have to be re-run without these variables. Finally, we synthesize all the steps of the procedure for verifying the validity and reliability of our measurement models in the table below.

Table 2 : Results of Exploratory Factor Analysis (AFE) and Confirmatory Factor Analysis (AFC)

Conceptual Phase			Results of Exploratory Factor Analysis (AFE)				Results of Confirmatory Factor Analysis (AFC)				Final measurement model
Concept/construct	Dimensions	Number of items	Number of items correlated positively and significantly	KMO	Total Explained Variance (AFE)	Cronbach Alpha	Average Variances Extracted (AVE)	Impact of the latent variable on the manifest variables		Composite Reliability Indicator	Cronbach Alpha	Number of items selected in the measurement model
Management Control Performance (PCDG)	Management Control Performance (PCDG)	25	5	(0,703)***	47,100 %	78,00 %	0,498	CTBIOAM	(1,517)*	82,8%	77,60 %	5
								MPA	(5,920)***			
								OLT	(3,464)***			
								OTBPPA	(5,463)***			
								PS	(3,100)***			
Social and Environmental Performance (PSE)	Social and Environmental Performance (PSE)	5	3	(0,548)***	49,619%	66,60 %	0,523	C1422	(8,316)***	74,7%	49,8 %	3
								CAPDG	(0,955)			
								TQM	14,359)***			

* : sig at the threshold of 10% ; ** : sig at the threshold of 5% ; *** : sig at the threshold of 1%

In this research, the operationalization of the concepts of Social and Environmental Performance (PSE) and Management Control Performance (PCDG) has taken the steps of the Churchill paradigm. Indeed, we have favored two aspects of factor analysis: Exploratory Factor Analysis (AFE) and Confirmatory Factor Analysis (AFC). Generally, the results of the second factor analysis are more robust than those of the former in view of its character as an explanatory method respecting the conditions of control and taking account of causal links. However it is seminal to carry out both analyzes simultaneously because on the one hand the explanatory methods and even their robustness, lead to results totally confusing if the user commits a specification bias. In this sense, the convergence between the results of the two analyzes is beneficial and is a sign of the validity and reliability of the constructs and the measuring instrument. We emphasize first of all the constructs in our model are two in number and are of a reflexive nature. For example, the ISO 14 000 and 22 000 label reflects the social and environmental concerns of the company. Moreover, the implementation of budgetary control, the

decentralization of its monitoring to management controllers and the increase in its frequency, the performance of methods to make forecasts and the continuous adaptation of these, These are signs of the performance of management control. Thus, before reflexive measurement models, validity is assessed through the homogeneity of the latent variables of each construct (their strong bilateral and multilateral association) and their heterogeneity with those of other reflex constructs (weak association).

During the conceptual phase, the concept of Management Control Performance (PCDG) was operationalized by a total of 25 latent variables. Indeed, based on the management control framework, it was not possible to exclude in the first instance dimensions in connection with budgeting operations, those relating to management accounting or those Strategy and its operational component. Theoretically, all these dimensions consider themselves to be related, and we were thus faced with the risk of spacing a significant part of the movement of the concept and therefore seeing through the prism a complex reality that we will have awkwardly Simplified and rendered distorted. This concern justified the retention of a total of 25 latent variables which we subsequently subjected to a test procedure based on statistical parameters to verify the validity of the construct (simple, partial, and factorial correlations) , Its reliability or its internal consistency (Cronbach Alpha). Thus, from 25 latent variables covering the strategic and operational dimensions of management control, it was only possible to keep 5 which are highly homogeneous. In fact, as shown in table no. The latent variables make it possible to have a coherent construct with respect to the value of the Cronbach Alpha in the AFE which is greater than 70%. Moreover, the average of the simple correlation coefficients between the 5 manifest variables is 45.32% with a strong adaptation to the factorization in view of the value of the Kaiser, Mayer and Olkin index, pointing out that if we limit ourselves To a single latent variable we will have lost only 30% of the explanation given by the 4 other variables not taken into account. Of course, this variable will explain almost half (47%) of the latent variable. The AFC validates the results of the Exploratory Factor Analysis (AFE) for the measurement model (constructed reflexively), since the 5 latent variables selected are all strongly correlated with the latent variable Average correlation coefficient is 69.58%). Moreover, the Average Variance Extracted (AVE) average, which shows the percentage of the variation of the reflexive construct shared between the latent variable and its manifest variables, complies with the required threshold of 0.5. In addition, the reflective construct of Management Control Performance (PCDG) has good discriminating validity since the average Variance Extracted (AVE) which is the shared variability in the construct is significantly higher than the coefficients of Correlation between the two measurement models. The results of the AFC endorse those of the AFE in terms of the internal consistency of the construction of the Performance of Management Control (PCDG) since the Cronbach alpha obtained by this explanatory method is 77.6% especially since the value of the Joreskog coefficient which is more robust than the Cronbach alpha is 82.8%. It should be emphasized that when the parameters of the conceptual model are estimated by the partial least squares algorithm by increasing the sample size by the bootstrapong method, we have found that 4/5 of the manifest variables of the concept of Management Control Performance (PCDG) are explained positively and significantly (at an error threshold of less than 1%) by their latent variable, as shown in the table above.

While the operationalization of the Management Control Performance (PCDG) was generally successful, that of Social and Environmental Performance (PSE) was only partially due to the complexity of the construction, the diversity of Its dimensions, the bias of subjectivity inherent in its measurement and also its relative eruption in the management of decision makers in Morocco. Thus, it was possible to identify only five initial manifest variables that allow to measure Social and Environmental Performance (PSE) without the instrumentation being tainted by the subjectivity of the respondent materializing by a confusion between the legal requirement And what falls within the scope of social responsibility. Like the Management Control Performance (PCDG) construct, Social Performance and Environmental Performance (PSE) is subject to two additional validation procedures. Indeed, Exploratory Factor Analysis (AFE) has shown that it will be necessary to eliminate two of the 5 latent variables chosen initially because of their negative correlation with the three other variables. Therefore, due to the weak correlation between these two obvious variables to be eliminated, they were discarded to finally give rise to a measurement model (constructed reflexive) with 3 manifest variables. However, already the smallness of the number of these presages problems of validity because we can not claim to identify the width of a concept such as the PSE and confine it to three dimensions which are: the possession of a label certifying respect (We have chosen the ISO 14001 and ISO 22000 certification), the possession of a label certifying an approach of respect for the environment (ISO 14001) and a certification rewarding the efforts of CSR (ISO 22000) as well as the composition of the board of directors ensuring a better representation of all the stakeholders. Finally, these three latent variables are moderately correlated (39%), explaining the need to measure PSE by the three items simultaneously and that it is not possible to limit one latent variable. Indeed, the KMO index emphasizes that if we confine ourselves to a single manifest variable (for example the possession of the ISO 14000 and 22000 label), we will thus have made the mistake of sacrificing almost half of the concept's mobility Of PES that would have been possible to capture if we use the set of obvious variables. However, let us stress the validity of the obvious variables chosen because if we assume that the concept is measured limitatively

by one of these variables, it will capture more than half of its variance. The internal consistency measured by the Cronbach alpha is average at the end of the Exploratory Factor Analysis (AFE) and amounts to 66%. However, we should not be surprised because on the one hand the number of manifest variables is reduced and their simple correlations are average. Thus, these results, a priori exploratory, make inevitable the use of an explanatory method to test the conceptual model. Indeed, the use of the partial least squares method to test validity and reliability shows the adequacy of the choice of two (2) obvious variables (Quality Certification and Social and Environmental Responsibility) while that of partner governance That it is positively associated with them) is not explained significantly by the Social and Environmental Performance (PSE). Concerning the validity of the Social Performance and Environmental Performance (PSE) verified by the AFE, the results are more conclusive than for the construction of the Management Control Performance (PCDG). Indeed, the average variance explained is greater than 0.5, reflecting the fact that more than half of the variance of the manifest variables is explained by the latent variable (or more than half of the total variance is shared between Components of the reflexive construct). Moreover, the PSE construct benefits from good discriminating validity because the Average Variance Extracted (AVE) average which is greater than 0.5 exceeds each of the correlation coefficients between the measurement models of which Does not exceed 0,471. Finally, the internal consistency of the PES construct is high in view of the Joreskog values which is 79% but which is low on the basis of that of the Cronbach Alpha.

In short, the operationalization of the concepts of Performance Management Control (PCDG) and Social and Environmental Performance (PSE) requires vigilance. Indeed the first one can be measured by several dimensions but which are paradoxically divergent not allowing to apprehend the Management Control Performance (PCDG) as a reflexive construct. On the other hand, Social and Environmental Performance (PSE) as a reflexive construct remains difficult to measure by latent metric variables, although these are identified, are most often homogeneous.

I.3 Methodology for specification and testing of the structural model

The specification of the econometric model as a test of the research model is of monumental importance. Indeed, from the econometric point of view, the specification bias consisting of omissions of explanatory variables in the model, a form of inadequate specification or a regression endogenous bias, is the most damaging bias at the level of one regression model. Moreover, several authors warn that studies testing conceptual models must take into account the effect of the control variables on the one hand and the causal relationships between the explanatory variables on the other. Secondly, it will be essential to comply with certain requirements imposed by the regression method used. This will be the case of a set of assumptions underlying the estimator, the breach of which alters the reliability and validity of the model.

In order to specify our econometric model (or the test model of the conceptual model), we refer, as was pointed out earlier, to the purist approach in econometrics that we combine with a more lax approach. The purist approach focuses on the choice of control variables and the precision of the causal links between the explanatory variables based on the theoretical literature. Indeed, in the context of the concepts of Performance Management Control and Social and Environmental Performance (PSE), the theoretical literature offers several clarifications on its determinants other than those we deal with in this research work. Indeed, stakeholder theory considers that institutional pressures drive the company to make greater efforts to accommodate the requirements of all stakeholders involved in the value creation process. Thus, the more the company is known (listed on the stock exchange), the more it will face more demanding media pressures. Thus, the Performance of Management Control is a factor that encourages him to engage socially and achieve a Social and Environmental Performance (PSE). In addition, the size and listing of a sub-fund at the Casablanca Stock Exchange (BVC) is a proxy for the availability of financial resources, financial autonomy (leverage), economies of scale and scope, and « Return on Assets » (ROA). As a result, the size of the company can explain its Social and Environmental Performance (PES), as it can explain its infrastructure to host a social and environmental responsibility. This effect of the size is complemented by that of the compartment of inscription on the Casablanca Stock Exchange (BVC). Indeed, stakeholder pressures differ from one compartment (stock market exchange) to another and are more constraining when the company operates in a major market area known for its detrimental effects on the natural environment or the health of employees. Thus, we believe that the companies operating in the compartment (the main market « 1st compartment »)[3] are more urged to put in place structures for initiating social and environmental responsibility strategies in the form of good dissemination initiatives Practices and reporting on environmental protection.

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[3] The main market (1st compartment) of Casablanca Stock Exchange : this compartment targets large companies, consolidation of accounts is necessary for companies with subsidiaries. The development market (2nd compartment) of Casablanca Stock Exchange : is aimed at medium-sized companies with attractive growth prospects. The growth market (3rd compartment) of Casablanca Stock Exchange: reserved for high-growth companies with a project to finance. In order to access these markets and raise funds for their development, companies must first meet certain conditions of admission.

Although the multinational dimension of public equities is decisive in strategic orientations, it can contribute to the explanation of public equity strategies within the framework of Social and Environmental Responsibility.

In this sense, we assume that the more the public equities are multinationals, the more they will be able to judge the extent of the effects of the company's activity on the natural environment and biodiversity, to put in place the strategies of social and environmental responsibility. In this regard, we monitor the effect of the multinational dimension on Social and Environmental Performance.

In the literature on Social and Environmental Performance (PSE), financial autonomy plays a predominant role in the implementation and deployment of good practices in terms of employability, working conditions, protection the natural environment and the payment of taxes. As a result, we add a control variable on the financial autonomy of public equities, namely leverage. In addition to the addition of control variables, we take into account the interaction between the latent variables. In this sense, we specify our model of such sign to take into account the direct effect. Indeed, we can propose that the effect of explanatory variables of the Management Control Performance (PCDG) influencing the adoption of social and environmental practices directly affecting the Social and Environmental Performance (PSE) of public equities. On the other hand, the following obvious variables: Composition of the Scoreboards by Indicator on Objectives and Actions carried out (CTBIOAM), « Dated and quantified» Long Term Objectives (LTO), Manual of Administrative Procedures (MPA) Have an effect on the performance of Management Control. This Management Control Performance (PCDG) is also determined by the variables: Organization of Project Dashboards, Action Plan (OTBPPA) and Long-Term Strategic Plan (SP) when the company is listed on the Casablanca Stock Exchange . Finally, the model of research taking the form of models of measurements and a model of structure with all the links between the latent variables is presented in the next figure. In this respect, the next table presents all the variables: explained, explanatory and the control variables.

Table 3 : Synthesis of econometric model variables

Entitled	Code	Nature	Expected effect on the endogenous variable	Assumptions	
Social and Environmental Performance (PSE)	CAPDG	Explanatory variable	Positive effect	H2	H_{21}
	C1422	Explanatory variable	Positive effect		H_{22}
	TQM	Explanatory variable	Positive effect		H_{23}
Management Control Performance (PCDG)	CTBIOAM	Explanatory variable	Positive effect	H1	H_{11}
	OLT	Explanatory variable	Positive effect		H_{12}
	MPA	Explanatory variable	Positive effect		H_{13}
	OTBPPA	Explanatory variable	Positive effect		H_{14}
	PS	Explanatory variable	Positive effect		H_{15}
Registration compartment	COMBVC	Control variable	Positive effect		
Multinational dimension	MULT	Control variable	Positive effect		
Financial Profitability	ROA	Control variable	Positive effect		
Size of the company	TAILLE	Control variable	Positive effect		
Financial Leverage	LEVIER	Control variable	Positive effect		

For the estimation of the parameters of the model we use a nonparametric method. On the one hand, the size of the sample is reduced for structural causes related to the characteristics of the research field and, on the other hand, the number of causal links specified is consequent in order to avoid the specification bias. In terms of methodology and nonparametric estimation, the number of observations to exist in order to estimate an econometric model should be at least 10 observations per manifest variable in the most important construct (to be explained) in The model, or 10 times the number of causal links. In both situations, we must have a sample size greater than 100 observations that we reach from the sampling method. Thus, we generate a total of 300 samples from the 40 observations we have and the regression coefficient of the endogenous latent variable on each manifest variable will be the average of all the 300 coefficients calculated on each of the 300 samples (Chin, 1998).

Generally, as a Partial Least Squares (PLS) type estimation method, the biases of the heteroskedasticity, the serial correlations, the multicollinearity and the residual normality are not detrimental (Chin, 1998). Indeed, the estimate retained is the average of a total of 300 different estimates, which makes it possible to compensate for the set of biases as if it were an experiment performed several times. As a result, any biases in the estimation of

the parameters of the model are laminated by the calculation of the averages, which tends to reduce the negative effect of the biases.

We judge the validity of our model with respect to the adjusted regression coefficient criterion, which measures the explanatory variable's share of the variability of the explanatory variable (Boutti, 2012). Thus, although this criterion is not essential in the end as long as the parameters of the model respect the sign prescribed by the theory (Gujarati, 2004), we use it as an indicator of the correct specification of the model.

We appreciate the reliability of our model by examining the conformity of the sign of each of its parameters to deductively conjectures. Thus, we will decide in favor of a reliable model if, on the one hand, the parameters are in accordance with the theoretical predictions and are statistically significant at the 5% threshold. The figure below presents our conceptual model: constructs, items and control variables.
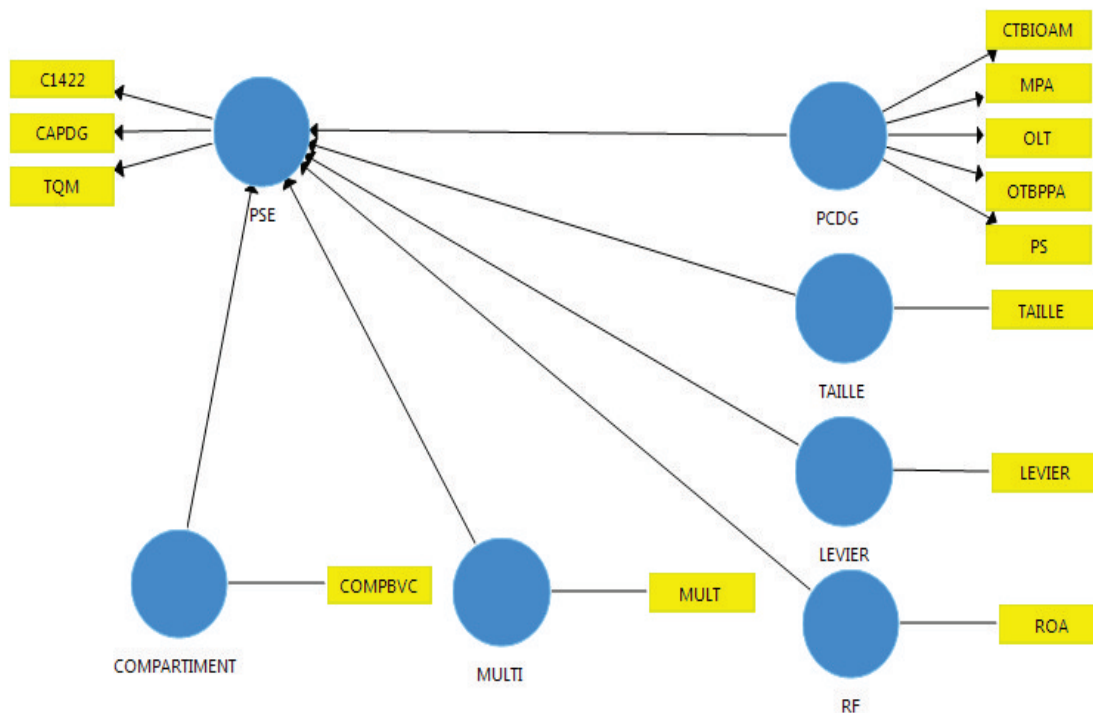
Figure 1 : Conceptual model established by the author using Smart PLS 3.0 software

Our choice of using the Partial Least Square (PLS)[4] approach to test our research model is justified by the fact that it allows analyzes on small samples. In this respect, our study looked at 44 public equities that responded to our questionnaire. In this respect, we can't use other software such as LISREL[5] which requires a minimum of 100 to 150 observations. To achieve this, we have tested the structural relationships of our model, the reflective nature of our constructs and the predictive vocation of our model led us to retain this method in the validation of our research model.

II. Measurement of the performance of our meta-model:
Methodology adopted and results discussions
II.1 Research population, data collection and variables measurement
In this second part, we present successively the methodology adopted for the empirical study and the results obtained before proposing a discussion articulated around the research assumptions.

Our research population was constituted by 44 public equities of the Casablanca Stock Exchange (BVC), the largest of the main market (1st BVC compartment), the development market (2nd BVC compartment) and the growth market (3rd BVC compartment).

Our goal is to analyze the management control and their impacts put in place by these companies on the Casablanca Stock Exchange (BVC).

Our choice of the target person was focused on the Controlling Head and the Controlling Director. The choice to send this questionnaire to the Directors and Head of the Management Control of companies listed on the Stock Exchange of Casablanca (BVC) naturally imposed itself.

In the case of Management Control Directors, if the partnerships are sometimes initiated and concluded by

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[4]The SmartPLS software is available under the link: http://www.smartpls.de/
[5] The case of AMOS software.

the regional or national management of the public equities, on the other hand , the management of the relationship is assured by the Director or Project Manager, the most able to decide on the interaction between the two organizations.

Our database was thus composed of respondents on both sides of the dyads analyzed (Directors and Management Control Managers). In some cases, the literature shows asymmetries regarding the relationship's perception of the relationship (Anderson and Narus, 1990). We thus tested the existence of these phenomena of asymmetry in the perceptions of success, performance and management control. For this purpose, we carried out the Exploratory Factor Analysis (AFE) on the items of the variable of Management Control Performance (PCDG) and on the items of the Social and Environmental Performance (PSE) variable. Reporting the result, we used Confirmatory Factor Analyzes (AFC) with an exogenous variable, namely Social and Environmental Performance (PSE).

We have to recognize that in order to test our model, we have calculated certain ratios. First, we have measured the variable Financial Leverage (Total of debts for the last five years / Own funds). Then, we have measured the Financial Profitability (ROA) variable (Current Profit before Tax for the last five years / Equity). Finally, we have measured the Size by Turnover variable over the last five years.

In this respect, we have analyzed the thirteen (13) action variables addressable as follows:

1. **VAR003** : Size of the company: variable measured by the turnover during the last five years
2. **VAR002/006** : Financial Profitability: Variable Measured by Current Income before Taxes on Own Funds
3. **VAR007/006** : Financial Leverage: variable measured by the sum of the debts to more than one year on the Own Funds during the last five years
4. **VAR011** : Long-term objectives (dated and quantified)
5. **VAR012** : Long-term strategic plan
6. **VAR040** : Composition of dashboards by indicator on objectives and the actions taken
7. **VAR041** : Organization of dashboards by project, by action plan
8. **VAR074** : Manual of administrative procedures
9. **VAR110** : Board of Director led by Chief Executive Officer (CEO)
10. **VAR118** : 14 000 or 22 000 certification standard
11. **VAR122** : Certification in the context of Total Quality Management
12. **VAR127** : Multinational dimension of the public equity
13. **VAR129** : BVC compartment

The choice of the Casablanca Stock Exchange (BVC) is due to the fact that this stock exchange must now take into consideration new constraints and must meet the challenges increasingly present (flexibility, responsiveness, performance) to the prism of the Subprime crisis. To this end, « management control » appears to be an essential factor in the competitiveness of the firm and « public equities », conscious of these stakes, develop practices and good behavior to face the crisis that occurred in 2008. This Stock Exchange is therefore a particularly interesting field of investigation within the framework of our research and a context favorable to the object of the study. Of the 77 surveys sent, 44 exploitable surveys were processed, a return rate of 58.44%. On the measurements of the variables, we relied, on the one hand, on pre-existing measures taken from the literature, on the other hand, on the series of interviews of experts with Management Controllers and Directors. These interviews were conducted during the second half of 2008. In the end, these measures were subsequently translated if necessary and pre-tested.

II.2 Test results of Structural Model Assumptions

The public equities of the Casablanca Stock Exchange (BVC) are the companies that must seek higher profitability. In this respect, the level of development of management control is very significant. In order to test the structural model that emphasizes the structural relations (hypotheses) between latent variables, we use an explanatory method. Thus, as reported in the methodology, our sample has only 44 companies making parametric methods inapplicable. Thus, we estimate the econometric model parameters used as a means of testing the structural model by the Partial Least Squares method. In addition, we generate a total of 300 random samples from the 44 individuals using non-repeat combinations of a few individuals selected from the 44 individuals in our sample. The estimation of the parameters is done by the maximum likelihood on each of the 300 samples generated and the value of each parameter of the model constitutes the average of 300 different estimates corresponding to each sample.

II.3 Test results of Structural Model

After presenting the thirteen (13) addressable action variables analyzed, we present in the following table the synthesis of the results of the estimation of the parameters of the structural model. Note that in mathematical terms, the latter takes the form of a system of linear equation expressing the causal link between the Management Control Performance (PCDG) and Social and Environmental Performance (PSE). However, a set of

dimensions are to be controlled and which are determinants of PES. Indeed, in the course of asset-based approaches to compliance with stakeholder requirements, the size (TAILLE) of the company is a factor that determines its adoption of CSR. Admittedly, size is a proxy of the availability of resources and also a measure of the weight of the constraint to which the company is subjected from the media. Therefore, an important size will have to be associated with a more truthful commitment in the preservation of the interests of the stakeholders. In addition, of the size the financial structure of the company (LEVIER) can explain its societal commitment. Indeed, the more the company is financed by equity, the more the decision-makers have the latitude to consider a more responsible management style. On the other hand, debt financing subjects them to the control of banks that are resistant to any expense that could increase the solvency risk of the company. So we control the effect of the financial structure through leverage which is the ratio between financing debt and equity. We also control the Financial Profitability (RF) factor. Admittedly, in the classic approaches to Social and Environmental Responsibility (RSE), only profitable companies that can afford to spend to improve working conditions and protect the environment beyond that which is required by regulation. We also control the effect of the internationalization of the company which is a factor that may explain its adoption of a socially responsible management style. In fact, Social and Environmental Responsibility (RSE) first appeared in the United States in the 1980s and then in Europe in the 1990s, and is still booming in the developing and emerging countries of Africa. Therefore, we assume that when the company establishing itself in Morocco is a subsidiary of a multinational corporation (MULT), it will be more accustomed to the procedures and procedures leading to Social and Environmental Performance (PSE) since the multinationals are the first entities targeted by the media and driven by governments to participate in the development of the geographical areas they exploit. Finally, we assume that listing on the stock exchange can influence Social and Environmental Performance (PSE) differently at the level of the rating compartment. Certainly in Morocco the information requirements for example differ from one compartment to another and are reinforced in the first compartment compared to the third compartment. Therefore, the compartment variable (COMPBVC) which takes 1 for the first compartment (main market), 2 for the second compartment (development market) and 3 for the third compartment (growth market) will have a negative impact on social and environmental performance.

$$PSE_i = \alpha_1 + \alpha_2.PCDG_i + \alpha_3.TAILLE_i + \alpha_4.LEVIER_i + \alpha_5.MULTI_i$$
$$+\alpha_6.RF_i + \alpha_7.COMPART_i + \varepsilon_i$$

**Figure 2 : Econometric form of the research model**

The results of the estimation of the parameters of the structural model show that the set of coefficients gives the expected sign and that only two are statistically significant. Indeed, the Management Control Performance (PCDG) is an inescapable determinant of the PSE. Moreover, the size of the company is a real incentive to deploy efforts in the field of CSR.

Table 4 : Main results of the structural model estimation

	PSE_i
$PCDG_i$	(0,471)***
$TAILLE_i$	(0,284)**
$LEVIER_i$	(-0,202)
$MULTI_i$	(0,102)
RF_i	(0,014)
$COMPART_i$	(0,188)
R^2	0,367
$R^2_{Ajusté}$	0,267

* : sig at the threshold of 10% ; ** : sig at the threshold of 5% ; *** : sig at the threshold of 1%

The study of our meta-model examined the relations between the Management Control and the Performance through two dimensions constituting the performance of the management control (the Control of Management Performance « PCDG » and the Social and Environmental Performance « PSE »). The following figure shows the results obtained from our identified, estimated and validated meta-model.
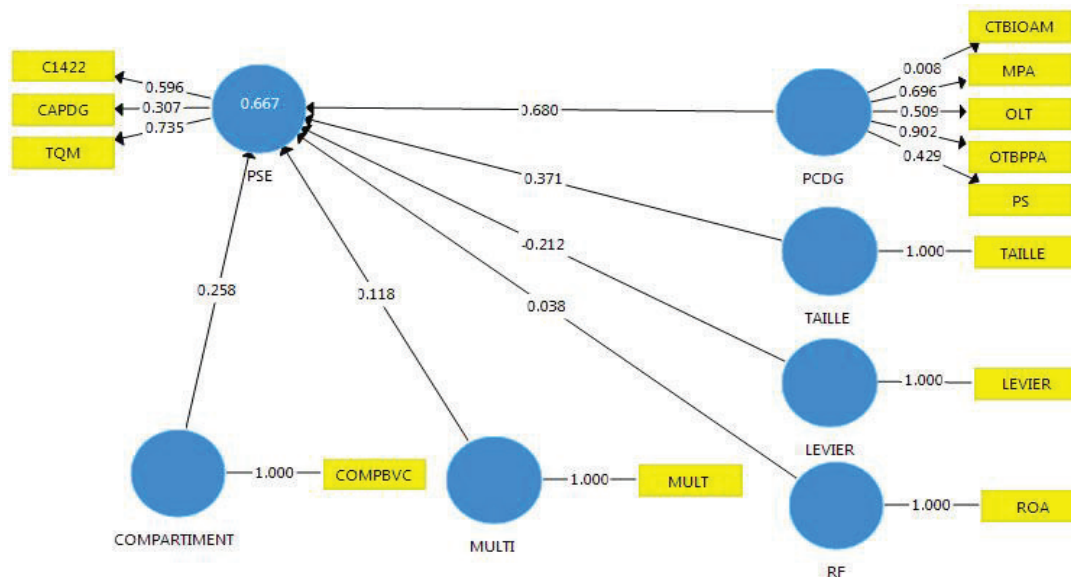
Figure 3 : The meta-model identified, estimated and validated

The meta-model of structural equations implemented allowed us first to test the existence of causal relations between the endogenous variable (« Social and Environmental Performance (PSE) », the explanatory variable «Management Control Performance (PCDG) » as well as the « Company Size », « Financial Leverage », « Financial Profitability », « Multinational Dimension » and « BVC Compartment » control variables. All in all, our meta-model has been well identified, tested and validated.

Conclusion

We were able to try to put together this description, both at the level of the organization in a Board of Director led by Chief Executive Officer (CEO), 14 000 or 22 000 certification and certification under Total Quality Management. That said, we were able to observe the rebound effect and the creation of quantum values of the Management Control Performance (PCDG) in the context of the subprime crisis. In total, the management control system could be highlighted by the graph below.

We were also able to present the indicators constructed from the data and which are used to construct the exogenous variables of our meta-model.

That is why we have also described the statistical analysis method, which consists of a model of structural equations, and more precisely a model derived from the Partial Least Square (PLS) approach. This method of econometric analysis has allowed (i) to study the multiple causal links between several latent and variable variables, and (ii) to use different schemes in order to construct these latent variables.

We finally presented the results obtained in the meta-model identified, tested and validated. These results enabled us to confirm the construction of the Concepts of Management Control Performance (PCDG) and its impact on the Social and Environmental Performance (PSE) of public equities expanded by selected indicators. The presentation of the results of the model was also discussed in terms of the quality of the model, the significant and moderately significant variables and the contribution of the latter to the explanatory power of the endogenous variable, namely Social and Environmental Performance (PSE) of public equities.

We were able to present a discussion on the validation of assumptions underlying the structural model by comparing the results of our meta-model identified and tested. Finally, we were able to conclude this chapter by demonstrating that the identified, tested and validated meta-model of the Management Control Performance (PCDG) was, according to our convincing results, adapted to the study of Social Performance and Environmental (PSE) companies of the Casablanca Stock Exchange (BVC).

Table 5 : Summary of research results

Assumptions of our research	Results / Significance
H1. Management Control Performance (PCDG)	
▪ **H1_1_ CTBIOAM** : The composition of the dashboards by indicator on the objectives and the actions carried out positively influences the Management Control Performance.	**Validated**
▪ **H1_2_OLT**: The integration of long-term objectives (dated and quantified) positively influences the Performance of Management Control (PCDG)	**Validated**
▪ **H1_3_MPA** : The implementation and the deployment of a manual of administrative procedures positively influences the Management Control Performance	**Validated**
▪ **H1_4_OTBPPA :** The organization of dashboards by project, by action plan, positively influences the Management Control Performance (PCDG)	**Validated**
▪ **H1_5_PS :** The implementation of a long-term strategic plan has a positive effect on the Management Control Performance (PCDG)	**Validated**
H2. Social and Environmental Performance (PSE)	
▪ **H2_1_CAPDG** : The existence of a Board of Directors led by Chief Executive Officer (CEO) has a negative effect on Social and Environmental Performance (PSE)	**Validated**
▪ **H2_2_ C1422 :** The implementation of a 14 000 or 22 000 standard certification in the public equities has a positive effect on the Social and Environmental Performance (PSE)	**Validated**
▪ **H2_3_TQM :** The existence of a Total Quality Management approach has a positive effect on Social and Environmental Performance (PSE)	**Validated**

Les résultats de notre recherche ont souligné l'influence des variables adressables d'action du contrôle sur la Performance Sociale et Environnementale (PSE) des « public equities », et l'effet de la performance perçue de la Fonction Contrôle de Gestion sur la Performance Durable de ces sociétés boursières dans le cadre la crise des « subprimes ». Ces résultats ont mis, aussi en évidence, la nécessité d'entreprendre des actions destinées à améliorer les dispositifs et les outils de la performance organisationnelle et financière, afin de réduire les résiliences sous-jacentes et les Facteurs Clés d'Echec (FCE) ou d'Insuccès (FCI) et de développer la Performance Durable. Nous avons pu récapituler et restituer à chaud ces propos de par la figure suivante, de la présentation du méta-modèle de recherche après l'étude empirique de notre recherche. The results of our research underlined the influence of the controllable actionable variables on the Social and Environmental Performance (PSE) of public equities and the effect of the perceived of the Control function on Performance Sustainable of moroccan public equities in the context of the subprime crisis. These results also highlighted the need to undertake actions to improve organizational and financial performance devices and tools to reduce resilience underlying Key Success or Failure Factors and to develop Sustainable Performance. We have been able to recapitulate and render hot these remarks by the following figure of the presentation of the meta-model of research after the empirical study of our research.

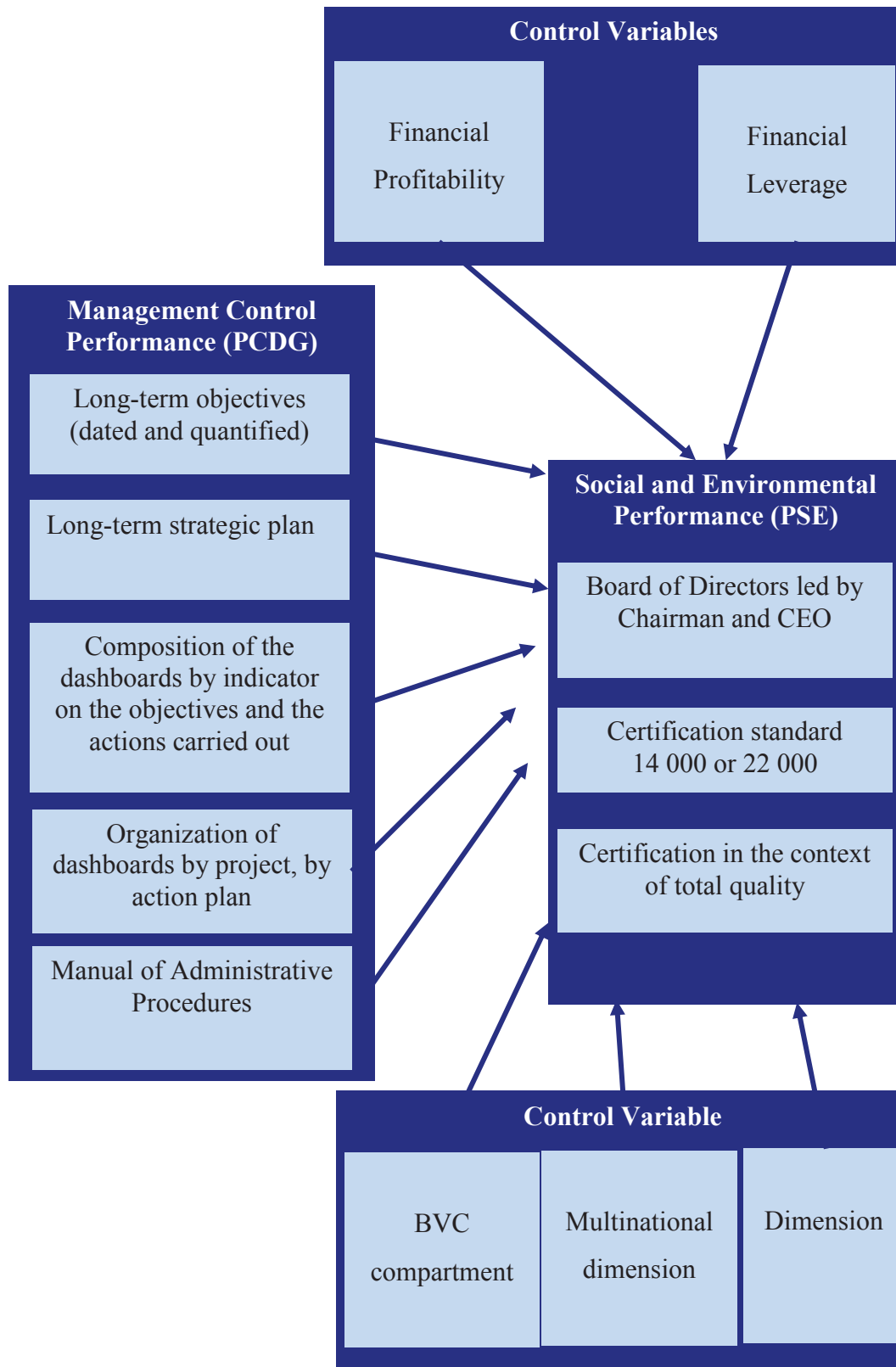The following figure presents the meta-model of research after the empirical study of our research.

Figure 4: Meta-model of research after empirical study

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Annex 1 : List of concepts and constructs

Dimensions	Items description	Items code
Performance of Management Control (PCDG)	Long-term objectives (dated and quantified)	OLT
	Long-term strategic plan	PS
	Dashboard Composition by indicator on objectives and the actions taken	CTBIOAM
	Organization of dashboards by project, by action plan	OTBPPA
	Manual of Administrative Procedures	MPA
Social and Environmental Performance (PSE)	Board of Directors led by Chairman and CEO (CEO)	CAPDG
	Certification standard 14 000 or 22 000	C1422
	Certification in the context of total quality	TQM
	Financial profitability	ROA
	Financial Leverage	LEVIER
	BVC compartment	COMPBVC
	Multinational dimension	MULT
	Dimension	TAILLE