

THE IMPACT OF IFRS NORMS ON INTERNAL GOVERNANCE MECHANISMS WITH REGARD TO SOCIO-ECONOMIC CONTEXT

Soumaya HERGLI

University of Carthage, Tunisia
Email: herglisoumaya@hotmail.com

Abstract:

The purpose of this paper is to examine the effect of International Financial Reporting Standards IFRS adoption on internal governance mechanisms with regard to socio-economic context. Empirical investigation was conducted to assess whether a company and an individual specifications can be presented as part of a general pattern. The results confirm that IFRS framework has introduced a new design of the accounting formalism facing a more complex activity leading to enlargement the discretionary space. Socio-economic factors explain perfectly the corporate governance behaviors and confirmed that the less powerful members of our firms sample expect and accept that power is distributed unequally, the leaders prefer to act as individuals rather than as members of groups, the management positions are generally held by men than by women, these members are threatened by ambiguous or unknown situations and finally, managers stand for the fostering in a society of pragmatic virtues oriented to future rewards, in particular perseverance, thrift and adapting to changing circumstances.

Keywords: IFRS, internal governance mechanisms, socio-economic factors.

The emergence of financial scandals has revealed weaknesses in corporate governance systems and eventually lead to a crisis of confidence with regard to "megacorp".

Actually, the main objective of many researchs is to explain the bankruptcy of companies considered as healthy and behaviors of their managers highly paid in order to minimize the reproduction of such crises and

eventually to regain the confidence of investors and all stakeholders.

The governance laws like american Sarbanes-Oxley "SOX" (2002)¹ and French financial security law "LSF" (2003)² have allowed a strong regulatory framework to strengthen the control and establish a new wave to define discretionary behaviors. A context of conventional accounting with different standards from one country to another has hampered the requirements of

¹ *The Sarbanes Oxley SOX Act of 2002 passed by U.S. congress to protect shareholders and general public from fraudulent practices by corporations.*

² *French financial security law was adopted by the french parliament on 2003 to impose a wide spanned and very pragmatic use of internal controls to improve transparency for shareholders.*

decoding financial statements internationally and the globalization of financial markets allowing to reestablish investors confidence.

The regulation (EC) N° 1606/2002 of the European Parliament, promulgating the application of international accounting standards, has imposed in 2002 international standards IFRS to all European listed companies at latest 2005. These standards are intended to unify the different repositories and adopt a common accounting language worldwide, in order to regain confidence by establishing reliability, legibility and transparency in financial statements allowing investors and analysts to better understand the economic reality of company's activities and properly assess its investment growth opportunities. This new regulatory framework has engendered a radical change regarding the communication of financial performances, acting as a mean of control and assessment of managers decisions. Certainly, these new IFRS norms can not be exempted of flexibility offered to managers, but a more careful, more precious and more stringent application may have an impact on earnings management compared with national standards.

Armstrong *et al* (2010) have pointed the role of financial reporting transparency in reducing agency conflicts among managers as well as in reducing agency conflicts between shareholders and creditors. Barth *et al* (2005-2006-2008) have documented that the application of international standards is associated with higher accounting quality. Another argument has presented by Shipper (2005) to describe how the adoption of IFRS by European Union firms in 2005 provided a potentially rich research setting for examining questions related to

determinants of financial reporting outcomes. Similarly, Ewert and Wagenhofer (2005) have argued that earnings quality increases with tighter standards. Ball *et al* (2003) have argued that adopting high quality standards might be a necessary condition for high quality information.

Tendeloo and Vanstraelen (2005) have not adhered to such remarks and have indicated that voluntary adopters of IFRS could not be associated with lower earnings management. Consistent with this argument, Lin and Paananen (2009) have confirmed the decrease of accounting quality after the mandatory EU adoption in 2005. Cormier and Darnaria (2010) have adhered to these arguments and documented that the balance sheet accounts are more valued under french GAAP than under IFRS.

A transition to a new accounting paradigm allowing to limit discretionary space of managers, regain credibility and reinforce confidence requires, as suggested by Jeanjean and Stolowy (2008), an harmonization of incentives and institutional factors rather than an harmonization of standards. Another research stream had noted that such norms can not only improve the accounting quality which must be necessarily associated with another factors. Daske *et al* (2008) have provided economic consequences and have documented an increase of market liquidity and a decrease of cost of capital around the time of the IFRS introduction. Veron *et al* (2004) have noted that accounting norms are not just a rational and abstract reasonings, they reflect the respective influences of different stakeholders in corporate life. Soderstrom and Sun (2007) have documented that the future improvement of the accounting quality will depend on the change of the political and legal system from one country to

another and incentives of the financial report of each company. Leuz *et al* (2003) have pointed a decrease of earnings management in investor protection strong protection limits insider' ability to acquire private control benefits, which reduces their incentives to mask firm performance. Barth *et al* (2012) have noted that IFRS firms have greater accounting system and value relevance comparability with firms that adopt IFRS mandatorily in countries with common law legal origin and high enforcement.

In this line of research, the purpose of this study is to examine the effect of adoption of International Financial Reporting Standards IFRS on internal governance mechanisms with regard to socio-economic context. The originality of this article is manifested to highlight the main influence of specific factors related to the firm and individual in order to explain the managers behaviors through an institutionalist approach noting the endogeneity of governance mechanisms with socio-economic factors.

International Financial Reporting Standards require perfect skills in several specialities namely, accounting, economy, sociology, marketing, in order to publish a financial information rooted in economical approach based on the present and future instead of a legal fiscal approach based on historical cost. In consequence, the technical complexity of this regulatory framework leads us to ask the first question:

1. IFRS standards are they able to improve internal governance mechanisms?

In this perspective, secondary questioning arises from this main issue, in particular, the complex and interrelated ties linking corporate governance and socio-economic factors, which lead us to ask the second question:

2. Differences of governance mechanisms are they explained by differences of socio-economic factors?

The literature review is presented by the next section. We are described the research design, results and conclusion in the following sections.

Literature review

According to "agency theory" formulated by Jensen and Meckling (1976), "agency relationship" explain the dilemma that the principal engages the agent to work toward the same goal, but, not necessarily to share the same interests. The agent has more or better informations than the principal when making decisions and transactions, which causes "information asymmetry" and imbalance of power. In relation to asymmetric information, "adverse selection" leads the principal to access to imperfect information and in fine to undesired results. In addition to adverse selection, "moral hazard" can occur when the actions of the agent may diverge toward other ways, which generates "transaction costs". The accounting is inscribed in this relationship to reduce asymmetric information and to inform the principal about agent's actions, by presenting a binding, standardized and understandable process able to reduce costs of monitoring and especially to ensure a proper alignment of interests. The theoretical framework of this accounting can be inscribed in two different perspectives. The company is considered in the first perspective as a simple pooling of resources by different principals for the main purpose to enriching themselves. According to this, the company is considered as a "vector of wealth creation" as mentioned by the "property theory" in which the wealth created is destined only to shareholders

and the company is considered as a "nexus of contracts" allowing only the creation of shareholders's wealth. The second perspective, considers the company as an "entity" for the main purpose to ensure its survival and perpetuation, which require the compensation of all stakeholders including shareholders as is explained by the "entity theory" framework.

"Entity theory" and "property theory" are the two major business theories which are reflected in accounting principals and rules drawn up by the standardization systems. International Financial Reporting Standards IFRS are inscribed in the first theoretical framework which favors the shareholder and aims to present a financial information rooted in an economic approach based on the fair value concept which requires perfect skills in several specialities namely accounting, economy, sociology, marketing.

This paper aims to examine if IFRS is able to maximize shareholders wealth by reinforcing a monitoring framework able to limit earnings management and ultimately improve internal governance mechanisms. Zghal *et al* (2011) have documented that IFRS adoption is associated by a reduction of earnings management in firms with good corporate governance practices. Wang and Campell (2012) have, on the contrary, noted that IFRS adoption is not associated by a reduction of earnings management. This research is intended to verify the following hypothesis:

H_1 : *IFRS norms improve internal governance mechanisms.*

Corporate governance represents a system of rules and practices allowing

an optimal allocation of rights and responsibilities of all stakeholders in company's life. The principles for the corporate governance of listed corporations are based on the Vienot Reports of July 1995 and July 1999 and on the Bouton Report of September 2002. The recommendations have been supplemented and successively updated in January 2007 and October 2008 and in April 2010³. OECD, CALPERS⁴, King Committee report and several other organisations have established a corporate governance codes. Generally, these codes revolve around two basic concepts: the exercise of power and the exercise of control. The fundamental objective is to limit the space between these two paradoxical sides. Pluchat (2010) has developed the "responsible governance" concept which integrates all stakeholders in order to create an immediate financial value for shareholders and also a global and sustainable value for other different stakeholders. This definition has on some ways disoriented the objectives that managers have had to serve their own interests and improve their own managerial values in the labor market. In these circumstances, knowing that conflict of interests is inevitable, we can understand the requirement that a governance system must have a rational framework able to establish a dynamic process of learning and of innovation allowing to seize new opportunities and achieve the planned objectives. It's in a "cognitive" or "positive" approach that this system can be perceived in a framework able to identify and develop the required knowledges and necessary skills of actors in order to stimulate a

³ This collection of recommendations was prepared by working parties of the Association Francaise des Entreprises Privees Afep and the Mouvement des Entreprises de France

Medef (Corporate Governance Code of Listed Corporations 2015).

⁴ California Public Employees Retirement System

corporate creative process. The "cognitive" approach of corporate governance has intended to create a "qualitative coordination" allowing the alignment of "cognitive diagrams" and "anticipatory models" (Charreaux 2005) in order to limit the discretionary space of managers and align "internal conflicts of interests". Chatelin and Trebucq (2003) are noted that these conflicts are generated by knowledge and interpretations of informations according to cognitive and individual models following the implications of the "behavioral approach" which aims to challenge the double behavioral hypothesis of "bounded rationality" and "opportunism" of actors. The special feature of this approach is the manifestation of "behavioral biases" (Charreaux 2005). Potential conflicts are generated by "cognitive" and "emotional" biases and not only by opportunistic managerial behaviors (Charreaux 2009). Governance system must create a "collective capacity" (Weistein (2010)) to ensure the alignment of interests and the creation of sustainable value despite threats of "cognitive conflicts" (Pluchart (2010)). Blair (2001) has signaled that this governance system includes formal and informal rules and principles to limit divergent actions. Licht (2001), Licht *et al* (2005) have argued that cultural factors are important in explaining corporate governance differences and ownership structures. According to these authors, cultural diversity across the world explains the behaviors and business practices. In this context, this paper is intended to test the following hypothesis:

H₂: socio-economic factors influence the corporate governance behaviors.

Methodology

Model description

In order to examine whether governance mechanisms are more effective after IFRS adoption with regard to the socio-economic context, the following regression model is employed to explore the relationship between governance mechanisms and discretionary accruals.

$$DA_{it} = \beta_1 IFRS + \beta_2 GMI_{it} + \beta_3 Siz_{it} + \beta_4 Lev_{it} + \varepsilon_{it}$$

With

$$GMI_{it} = \theta_1 SE_{it} + \theta_2 GDP_{it} + u_{it}$$

Where DA_{it} = discretionary accruals normalized by the total assets of the beginning of the period in year t for firm i; $IFRS = 1$ if the firm adopts the IFRS, 0 otherwise; GMI_{it} = Internal governance mechanisms index. This index represents an exogenous variable having endogeneity relations with socio-economic factors; SE_{it} = socio-economic factors represented by cultural dimensions of Hofstede (2010) namely: power distance, individualism, masculinity, uncertainty avoidance and long term orientation. These values are controlled by GDP per capita in order to verify if they represent the majority of socio-economic factors; Siz_{it} = the size measured by natural logarithm of total assets in year t for firm i; Lev_{it} = The debt measured by the total debt divided by total assets in year t for firm i.

Measure of earnings management

Earnings management is usually defined as an intervention by the managers of the firm in order to get a gain at the expense of others parties (Cormier *et al* (1998)). When these parties are the shareholders, earnings management can be analyzed as the expression of a moral risk taken by these

shareholders against managers who have discretionary power in the earnings management.

Various measures of earnings management were used by the previous literature. In this paper, we use the modified Jones model of Dechow et al (1995). This model is adopted by the majority of previous literature (Lobo and Zhou (2006, 2009), Bartov and Cohen (2009), Rezaee and Jain (2004)) and still used by the recently studies (Bryce et al (2015), us following:

$$\frac{TAcc_{it}}{TA_{it-1}} = \alpha_1 \left(\frac{1}{TA_{it-1}} \right) + \alpha_2 \left(\frac{\Delta Rev_{it} - \Delta REC_{it}}{TA_{it-1}} \right) + \varepsilon_{it}$$

Where: TAcc = total accruals in year t for firm i; TA = Total assets in year (t-1) for firm i; ΔRev_{it} = Revenues in year t less revenues in year (t-1) for firm i; ΔREC_{it} = Receivables in year t less receivables in year (t-1) for firm i; PPE_{it} = Level of gross property, plant and equipment at year t for firm i and ε_{it} = Error term in year t for firm i.

The level of earnings management is calculated by the prediction error:

$$DA_{it} = \frac{TAcc_{it}}{TA_{it-1}} - \alpha_1 \left(\frac{1}{TA_{it-1}} \right) + \alpha_2 \left(\frac{\Delta Rev_{it} - \Delta REC_{it}}{TA_{it-1}} \right) + \alpha_3 \left(\frac{PPE_{it}}{TA_{it-1}} \right)$$

Where DA_{it} = The prediction error, the level of discretionary accruals.

Measure of governance mechanisms

Several researches have studied internal mechanisms in generally based on individual measures such as the board of directors and the audit committee (Klein (2002), Peasnell et al (2005), Xie et al (2003)). Recently, this variable is measured following an

indexical approach that generally reflects governance mechanisms (Bowen et al (2008), Jiang et al (2008), Larcker et al (2007), Shen and Chih (2007), Bekiris and Doukakis (2011), Black et al (2012)). This approach classifies companies according their governance quality.

The corporate governance score created by Standards and Poor's (2002) based generally on the ownership structure and concentration mechanisms, the relationships between the stakeholders, the transparency and disclosure of informations and the board structure. For example, the Credit Lyonnais Securities Asia CLSA has created on 2001 a corporate governance score based generally on the leadership's discipline, the transparency of informations, the structure and operation of the board of directors and the audit committee responsibility. in the same line, the International Shareholders Services ISS has established on 2003 a corporate governance score based generally on the board of directors, the remuneration policy, the capital and ownership structure.

The corporate governance score created by Black (2001) have based essentially on the transparency of published informations, the ownership structure, the bankruptcy risk and the existence of foreign shareholders. Campos et al (2002) have initiated a corporate governance score based particulary on the transparency of published informations, the size, composition, operation and independance of the board of directors and of the audit committee, the ownership structure and the voting rights. The governance score established by Black et al (2006) has based on the shareholders rights mechanisms, the disclosure of informations, the structure

and composition of the board of directors and of the audit committee. The board of directors' characteristics, the ownership structure and the remuneration policy have been selected by the corporate governance score created by Larcker *et al* (2007).

Bekiris and Doukakis (2011) have constructed the corporate governance score based on five dimensions as following: board of directors, audit committee, remuneration committee, ownership structure and the transparency of published informations. These items have included all the important corporate governance variables. The majority of these items were selected from the two basic corporate governance rating firms (risk Metrics former ISS Proxy and GMI scores), from the Standard and Poor's score and also from existing literature which focused on the same research stream.

The corporate governance score created by this research is based on the Bekiris and Doukakis work because it has the synthetic nature of the proposed measures, which included deeply all the important of internal corporate governance items. The rating procedure of this index follows a Principal Component Analysis PCA of all the selected items presented by appendix 1.

Board of directors, Audit committee, Remuneration committee, Shareholders rights and transparency of published informations and Ownership structure.

The Principal Component Analysis PCA method is used because we have obtained a large number of variables, and believe that there is some redundancy in those variables. This method is used in order to reduce the observed variables into a smaller number of principals components that will account for most of the variance in

the observed variables. This index will be constructed by a weighted average of main components according to the methodologies of Nagar and Basu (2002), Krishnakumar and Nagar (2008), Correa *et al* (2009), Mbend and Edson (2012) and using the following formula:

$$IQGE = \frac{\lambda_1 P_1 + \lambda_2 P_2 + \dots + \lambda_k P_k}{\lambda_1 + \lambda_2 + \dots + \lambda_k}$$

Where, weights are the eigenvalues (λ), with $\lambda_1 = \text{var } P_1, \dots, \lambda_k = \text{var } P_k$

Principal component P_1 corresponds the highest weight $\frac{\lambda_1}{\sum \lambda_i}$ since it captures the largest change different variables. Thereafter, this index is standardized on a scale from "0", which indicates the lowest level of the index, to "10" indicating its highest level as following:

$$IQGE = \frac{IQGE_i - \text{Min}(IQGE)}{\text{Max}(IQGE) - \text{Min}(IQGE)}$$

Measure of socio-economic factors

The culture has defined by several studies. Licht *et al* (2007), the essential elements of all these definitions are particularly shared values and beliefs. These elements are common to the various sciences disciplines of human and society that include management sciences, economy and psychology. Stulz and Williamson (2003) have used "predominant religion" as a cultural proxy. Licht *et al* (2005) have pointed that the religion is a practical measure but fails to capture the richness of cultural differences especially for protestant countries against others. In addition, it's difficult for this proxy to represent the complexity of religious changes around the world and differences in religious commitment within countries. The majority of the theories in intercultural psychologies

have conceptualized and measured culture without resort to broad approximations such as the religion.

Defining "culture" is not easy task. Half a century ago, Kroeber and Kluckhohn (1952) found 164 distinct definitions of culture⁵, and that number keeps growing (Taras, Rowney and Steel (2009)). According to Hofstede (2001), "*Culture is defined as collective programming of the mind*".

This author has explained that *all countries in the world share the same basic problems, but each national society has over time developed its own answers to six basic problems for each society:*

1. *How much (in)equality should there be among us?*
2. *How afraid are we of unknown people, ideas and objects?*
3. *How dependent are we on our (extended) family?*
4. *How should a man feel? how a woman?*
5. *Do you focus on the future, the present or the past?*
6. *May we have fun or is life a serious matter?*

These six questions can be seen as six different and separate dimensions of national cultures. This author was the first to supplement a theoretical model to describe quantitatively national cultures through four value dimensions: power distance, individualism vs collectivism, gender cultures (masculinity vs femininity), uncertainty avoidance, long term vs short term orientation. Power distance an extent to which the less powerful members of institutions and organizations expect and accept that power is distributed unequally.

Individualism, the degree to which people prefer to act as individuals rather than as members of groups, in

individualist cultures any person is expected to look after self and immediate family only, while in collectivist cultures individuals from birth onwards are part of strong in-groups that protect interest of its members in return for their loyalty. Masculinity, the degree to which emotional gender roles are distinct: men should be assertive, tough and focused on material success, women on the quality of life.

Femininity, A society in which emotional gender roles overlap: both men and women are supposed to be modest, tender, and focused on the quality of life. Uncertainty Avoidance, the extent to which the members of a culture feel threatened by ambiguous or unknown situations (not to be confused with risk avoidance; members of an uncertainty avoiding culture take risks as long as they believe they know them). Long- vs, short-term orientation dimension (a.k.a. Confucian Dynamism) stands for the fostering in a society of pragmatic virtues oriented to future rewards, in particular perseverance, thrift, and adapting to changing circumstances, its opposite pole, Short-Term Orientation, stands for the fostering in a society of virtues related to the past and the present, such as national pride, respect for tradition, preservation of face, and fulfilling social obligations. This dimension was later added to the model (Hofstede 2010).

Basing on Hofstede (2010) dimensions and his prediction that the culture change has been extremely slow and should be measured in terms of generations and centuries, the culture variable of our analysis is measured based on dimensions of power distance, individualism, masculinity, uncertainty avoidance and long - vs, short-term

⁵ Taras, Steel and Kirkman (2012)

orientation controled by GDP per capita in order to check if these dimensions represent the majority of socio-economic factors.

Control variables

According to Watts and Zimmerman (1986), the most indebted companies with large sizes are the most able to master the discretionary space of managers. The effect of internal governance mechanisms is therefore, influenced by the size and debt level of the firm. The size is measured by natural logarithm of total assets in year t for firm i . The debt is measured by the total debt divided by total assets in year t for firm i .

Data

A sample of 439 listed european companies (15 countries of the first european union: Germany - Austria - Belgium - Danemark - Spain - Finland - France - Greece - Ireland - Italy - Netherlands - Portugal - United Kingdom - Sweden - Switzerland⁶ for the period between 2000 and 2011 is identified. All financial informations are collected from

OSIRIS database and governance informations from the Mergent On Line database. The number of sample companies per country is presented by table 5 (annexe).

Results

The empirical model is selected to validate the effect of IFRS norms on internal governance mechanisms with regard to the socio-economic context.

Descriptive statistics

Descriptive statistics are used to describe the basic features of data and provide simple summaries about the sample and different measures.

Table 1 reports the basic statistics namely, Mean, Standard Deviation, minimum and maximum of accruals (ACC), International Financial Reporting Standards (IFRS), Governance Mechanisms Index (GMI), Power Distance (Pow), Uncertainty Avoidance (Uncert), Individualism (Indiv), Masculinity (Mascul) and Long term orientation (L.term).

Table 1

Descriptive statistics

	Obs	Mean	Std.dev	Min	Max
Acc	5244	-.0890053	.2213913	- 2.791481	2.416337
IFRS	5244	.6022121	.4894879	0	1
GMI	5244	3.382116	2.861866	-2.656047	8.470938
Pow	5244	41.4530	16.84129	11	68
Uncert	5244	64.61098	26.41484	23	112
Indiv	5244	65.86957	15.07726	27	89
Mascul	5244	47.53318	23.06836	5	79
L.term	5244	54.86499	17.5193	24	83

⁶ We added Switzerland because it presents a comparable economic power and

eliminated Luxembourg following a data availability problem

Table2

Covariance matrix								
	<i>A</i> <i>cc</i>	<i>IFRS</i>	<i>GMI</i>	<i>Pow</i>	<i>Unc</i>	<i>Indiv</i>	<i>Masc</i>	<i>L.term</i>
<i>Ac</i> <i>c</i>	1.000							
<i>IFR</i> <i>S</i>	-0.0485	1.000						
<i>GM</i> <i>I</i>	0.0162	0.0021	1.000					
<i>Po</i> <i>w</i>	0.0484	0.0110	0.2069	1.000				
<i>Un</i> <i>ce</i>	0.0294	-0.010	0.1769	0.7805	1.000			
<i>Ind</i> <i>iv</i>	-0.034	-0.007	0.0469	-0.295	-0.656	1.000		
<i>Ma</i> <i>s</i>	-0.093	-0.046	0.0962	0.0008	0.2719	-0.029	1. 000	
<i>L.t</i> <i>e</i>	0.0365	-0.019	0.0260	0.3197	0.4389	-0.283	0.0344	1.000

Table 2 presents the correlation coefficients of all variables. Except for the high correlation of up to 0.78 between Power Distance and Uncertainty and to -0.65 between Individualism and Uncertainty, the correlation coefficients between other pairwise variables don't presented generally a multicollinearity problem.

Results of Principal Component Analysis

The internal governance index

allows to identify the "main components" or "main axes" representing linear combinations which retain the maximum of informations with the minimum of variables. In order to follow a rigorous process to confirm the use of this method and find the best possible solution, the tests of Barlett sphericity and Kaiser, Meyer and Olkin (KMO) are the main diagnostic tools. The results of these tests are presented as follows:

Table 3

KMO index and Bartlett test analysis	
Precision measurement of sampling	0.712
Kaiser-Myer-Olkin (KMO)	
Bartlett's test of sphericity chi-square approximated	83208
Degree of freedom	561
Bartlett significance	0,000

The results pointed that comprehensively factorial relationship is statistically acceptable and that variables are consistent for constructing appropriate measures. Furthermore, the representation quality analysis, which aims to examine the variables quality and retaining only those with extractions greater than 0.5, has retained all selected variables into 12 factorial axes according to the varimax rotation method, the most frequently used allowing to present axes with unique and non-shared information. These axes have explained the 70.767\% of total variance presented by table 6 (annexe).

Results of SLS estimation

This paper aims to explain corporate governance patterns by investigating the impact of IFRS norms on internal governance mechanisms with regard the socio-economic factors which are measured by Hofstede (2010) values: Power distance, Individualism, Masculinity, Uncertainty avoidance and Long-vs Short-term orientation. These values are controlled by GDP per capita in order to verify if they are able to represent the majority of socio-economic factors.

Internal mechanisms are calculated by a Principal Component Analysis of 34 items based on five dimensions namely board of directors, audit committee, remuneration committee, ownership structure and the transparency of published informations.

Prior to analyze the SLS estimation, it's important to note that descriptive statistics and the covariance matrix are presented quantitative description and declared that there's any collinearity problem between different variables essentially accruals, IFRS, governance index and cultural variables. In addition, Durbin Watson (Root MSE) and VIF (variance inflation factor) and Hausman test are confirmed the bias of OLS (ordinary least square) and the existence of endogeneity relations between the internal governance mechanisms and the socio-economic factors. Consequently, Three Stage Least Square 3SLS, is the most effective estimator used when the endogenous explanatory variables are dependent variables from other equations in the system⁷. The instruments which can solve this endogeneity must not only be exogenous but also uncorrelated with the error term (Glaeser, LLS (2004)). 3SLS estimations are presented as follows.

⁷Three Stage estimation for systems of simultaneous equations
<http://www.stata.com>

Table 4

3 SLS estimations

	<i>Global analysis</i>	<i>Pre IFRS</i>	<i>Post IFRS</i>
Acc			
IFRS	-.0190388 (-3.05)***		
GMI	.0150749 (0.53)	.2067406 (1.51)*	.0353883 (0.98)
Size	-.005539 (-4.15)***	-.0023512 (-0.37)	-.0069715 (-4.15)***
Leverage	-.0828403 (-4.64)***	-.1564363 (-1.72)**	-.0983288 (-4.53)***
GMI			
Power distance	-.0026543 (-5.17)**	-.0028046 (-3.56)***	-.0025028 (-3.70)***
Uncert Avoidance	.0060391 (11.75)***	.0060928 (7.47)***	.005987 (9.04)***
Individualism	.0060886 (10.42)***	.0057721 (6.22)***	.0063048 (8.38)***
Masculinism	-.0012581 (-6.36)**	-.0012879 (-4.12)***	-.0013218 (-5.17)***
Long term	.0019216 (4.70)*	.0020549 (3.12)***	.0018581 (3.56)***
GDP	-.0023701 (-3.40)***	-.0021653 (-1.97)**	-.0026276 (-2.92)***
R2 Acc	0.0114	0.0016	0.0132
R2 GMI	0.1387	0.1381	0.1397

Table legend: Acc represents discretionary accruals based on modified version of Jones (1991). GMI represents the governance mechanisms index based on a Principal Component Analysis of 34 items namely board of directors, audit committee, remuneration committee, ownership structure and transparency of published informations. Power Distance, Uncertainty Avoidance, Individualism, Masculinity and Long term represent the cultural dimensions developed by Hofstede (2010) in order to measure the socio-economic factors. GDP represents the natural logarithm of country's GDP. Obs represents the number of observations. Size represents the natural logarithm of total assets. Leverage is expressed by total debt divided by total assets. 3 SLS represents the most effective estimator of the endogeneity approach. Standard deviations are presented in parenthesis and corrected of Heteroscedasticity by White 1980. *, **, *** represent respectively significance level of 10, 5 and 1 %.

IFRS variable is negatively and significantly related to the earnings management to explain that these new norms are able to create a new accounting paradigm which aims to

reduce the opportunistic actions of managers (Ewert and Wagenhofer (2005), Schipper (2005), Barth et al (2005), Barth et al (2006), Daske and Gebhardt (2006), Barth et al (2008),

Jenning *et al* (2004), Armstrong (2010), Ball *et al* (2001), Schipper (2005)).

Governance mechanisms estimations pointed that the establishment of a new accounting framework which aims to present an information more transparent, more reliable and comparable internationally requires perfect skills in several specialities: accounting, economy, sociology, marketing. IFRS framework has further expanded the discretionary freedom of managers, caused by the complexity brought by its economical and financial approach which based on the "fair value" concept. IFRS 13 has replaced the historical cost for the assessment of fair value in order to present an accounting and financial information more rooted in economical reality approach based on the present and the future instead of a legal and fiscal approach based on historical cost. For this purpose, the accounting registration of almost all economic operations of the firm has transformed, basic accounting principles have been questioned and several accounting formalities concepts have been changed. In consequence, the accountant must be able to understand the company's economic reality and the financial goals of a particular transaction. Furthermore, the accounting logic has clearly pointed that a more complex activity leaves a more flexibility for managers in measurement and ascertainment of earnings.

The estimation results confirmed the predictions that the impact of internal governance mechanisms on the opportunistic space of managers decreased. This result explains that the effect of governance mechanisms is more important with local norms than with IFRS norms. Compared to local standards, the IFRS norms requires improved internal governance mechanisms in order to

ensure the mastery of opportunistic actions of managers.

Blair (2001) has explained that the "corporate governance" represents all legal, cultural, and institutional rules and principles allowing to lead, administer and control the institution in order to ensure an optimal level between the exercise of power and the exercise of control. Good practice of governance mechanisms, provided by "a collective capacity" is in consequence able to limit the space between these two paradoxical sides (Weistein (2010), Pluchart (2010) after IFRS norms to confirm the first hypothesis which predicts that IFRS norms improve internal governance mechanisms. IFRS standards are therefore able to improve internal governance mechanisms and confirm the first hypothesis \$H1\$, if they are established with a good governance practices provided by a "collective capacity".

The socio-economic factors represented by cultural dimensions of Hofstede (2010) controled by GDP per capita are presented significative relations to confirm in the first side that these cultural dimensions are perfect proxies to represent the majority of socio-economic factors. On the other side, the estimation of these variables confirms the endogeneity relations with internal governance mechanisms. This result explains that socio-economic factors explain perfectly the corporate governance behaviors across the world (Licht (2001), (Licht *et al* (2005))). The significances and the signs of cultural values estimations explain that: the less powerful members of our firms sample expect and accept that power is distributed unequally, the leaders prefer to act as individuals rather than as members of groups, the management positions are generally held by men than by women, these members are threatened by ambiguous or unknown

situations and finally, managers stand for the fostering in a society of pragmatic virtues oriented to future rewards, in particular perseverance, thrift and adapting to changing circumstances. Socio-economic factors influence corporate governance behaviors.

The control variables, size and debt, are generally presented negative and significant to explain that the effect of internal governance mechanisms is influenced by the size and debt level of the firm. Thus, the most indebted companies with large sizes are the most able to master the discretionary space of managers.

Conclusion

This research aims to examine the impact of IFRS norms on internal governance mechanisms with regard their endogeneity relations with socio-economic factors. Internal governance mechanisms are measured by an index based on a Principal Components Analysis of 34 items namely board of directors, audit committee, remuneration committee, ownership structure and transparency of published informations. The results noted that this new regulatory framework is not able to allow the studied companies to play their oversight role and pertinently control the discretionary space of opportunistic actions. These mechanisms are less valued under IFRS norms than local standards. This result explains that the effect of these mechanisms decreased after the establishment of IFRS norms.

The endogeneity estimation noted that socio-economic factors represented by the cultural values of Hofstede (2010) and controled by GDP per capita, perfectly representing the majority of socio-economic factors. This endogeneity relations explain the differences of corporate governance

behaviors across the world (Licht (2001), Licht *et al* (2005).

The results noted that the less powerful members of our firms sample expect and accept that power is distributed unequally, the leaders prefer to act as individuals rather than as members of groups, the management positions are generally held by men rather than by women, these members are threatened by ambiguous or unknown situations and finally, managers stand for the fostering in a society of pragmatic virtues oriented to future rewards, in particular perseverance, thrift and adapting to changing circumstances. Taking into account socio-economic factors to examine the impact of International Financial Reporting Standards IFRS adoption on internal governance mechanisms allows this paper to highlight a new theoretical vision in corporate governance theories. This originality manifested the main influence of specific factors related to the firm and individual in order to explain the managers behaviors through an institutional approach of shared values and beliefs.

The control variables, size and debt, are generally presented as negative and significant to explain that the effect of internal governance mechanisms is influenced by the size and debt level of the firm. The most indebted large companies are the most able to master the discretionary space of managers.

Finally, it should be important to note that it's insufficient to assess the impact of IFRS norms only by examining the internal governance mechanisms. To analyze the combined effect of internal and external governance mechanisms with regard the endogeneity relations with socio-economic factors pre and post IFRS using a larger sample offer interesting perspectives of research.

REFERENCES

- Armstrong, S, Guay, R.W, Weber, P.J (2010), *The role of information and financial reporting in corporate governance and debt contracting*, Journal of Accounting and Economics, vol. 50, p.179-234.
- Ball, R (2001), *Infrastructure requirements for an economically efficient system of public financial reporting and disclosure*, Brookings-Wharton Papers on Financial Services, p. 127-169.
- Ball, R (2006), *International Financial reporting Standards (IFRS): Pros and for investors*, Accounting and Business Research, International Accounting Policy Forum, p. 5-27.
- Ball, R, Kothari, S.P, Robin, A (2000), *The effect of international institutional factors on properties of accounting earnings*, Journal of Accounting and Economics, vol. 29, N° 1, p. 1-51.
- Ball, R, Robin, A, Wu, J.S (2003), *Incentives versus standards: properties of accounting income in four east Asian countries*, Journal of Accounting and Economics, vol. 36, p. 235-70.
- Barth, M.E, Beaver, W.H, Hand, J.R.M, Landesman, W, R (2005), *Accruals, accounting based valuation models and the prediction of equity values*, Journal of Accounting, Auditing and Finance, vol. 20, N° 4, p. 311-345.
- Barth, M.E, Landsman, W.R, Lang, M, (2008), *International accounting standards and accounting quality*, Journal of accounting research, vol. 46, N°3, p. 467-498.
- Barth, M.E, Landsman, W.R, Lang, M, Williams, C (2006), *Accounting quality: International accounting standards and US GAAP*, Working paper, University of North Carolina and Stanford University.
- Barth, M.E, Landesman, W.R, Lang, M, Williams, C (2012), *Are IFRS based and US GAAP-based Accounting Amounts comparable?*, Journal of Accounting and Economics, vol. 54, p. 68-93.
- Bartov, E.A, Cohen (2009), *The numbers game in the pre and post Sarbanes-Oxley eras*, Journal of Accounting, Auditing and Finance, Vol. 24, N°4, p. 505-534.
- Bekiris, F.V, Doukakis, L.C (2011), *Corporate Governance and accruals earnings management*, Managerial and Decision Economics.
- Black, B (2001), *The corporate governance behavior and market value of Russian firms*, Emerging markets review, vol. 2, p. 89-108.
- Black, B, Carvalho, A.G, Gorga, E (2012), *What matters and for which firms for corporate governance in emerging markets? Evidence from Brazil (And other BRIC countries)*, Journal of corporate finance, vol. 18, p. 934-952.
- Black, B, Jang, H, Kim, W (2006)a, *Does corporate governance affect firms market values? Evidence from Korea*, Journal of law, economics and organization, vol. 22, p. 366-413.
- Black, B, Jang, H, Kim, W (2006)b, *Predicting firms corporate governance choices: Evidence from Korea*, Journal of corporate finance, p. 660-691.
- Bowen, R.M, Rajgopal, S, Venkatachalam, M (2008), *Accounting discretion, corporate governance and firm performance*, Contemporary accounting research, vol. 25, N° 2, p. 351-405.

- Bryce, M, Jahangir, A.M, Mather, P.R (2015), *Accounting quality in the pre/post IFRS adoption periods and the impact on audit committee effectiveness: Evidence from Australia*, Pacific Basin Financial Journal.
- Burgstahler, D.C, Hail, L, Leuz, C (2007), *The importance of reporting incentives: Earnings management in European public firms*, The Accounting Review, vol. 81, \No 5, p. 983-1016.
- Campos, C.E, Newell, R.E, Wilson, G (2002), *Corporate governance develops in emerging markets*, Mckinsey on finance, p. 15-18.
- Charreaux, G (2005), *Pour une gouvernance d'entreprise comportementale : Une reflexion exploratoire*, Revue Francaise de Gestion, vol. 31, N°157, p. 215-238.
- Charreaux, G (2009), *Droit et gouvernance : L'apport du courant comportemental*, Cahier de FARGO, N° 1091001, 22 p.
- Chatelin, C, Trebucq, S (2003), *Stabilite et evolution du cadre conceptuel en gouvernance d'entreprise : Un essai de synthese*, Communication pour les 9eme journees d'histoire de la comptabilite et du management, CREFIGE-Paris Dauphine, 25 p.
- Cormier, D, Demaria, S (2010), *La valorisation boursiere des etats financiers des sociétés Francaises: Pertinence du referentiel IFRS*, Cahier de recherche 2010-05 ESG UQAM.
- Cormier, D, Magnan, M, Morard, B (1998), *La gestion strategique des resultats: Le modele anglo-saxon convient-il au contexte suisse?*, Comptabilite, Controle, Audit, vol. 4, p. 25-48.
- Correa, L.F, Amaral, H.F, Louvet, P (2009), *Un indice de gouvernance pour les entreprises au Bresil*, 5eme colloque de l'IFBAE Grenoble, 18-19 mai.
- Daske, H, Gebhardt, G (2006), *International financial reporting standards and experts' perceptions of disclosure quality*. Abac. 42, p. 461-498.
- Daske, H, Hall, L, Leuz, C, Verdi, R (2008), *Mandatory IFRS reporting around the world: Early Evidence on the economic consequences*, Journal of Accounting Research, vol. 46, N° 5, p. 1085-1142.
- Dechow, P, Sloan, R, Sweeny, A (1995), *Detecting earnings management*, The Accounting Review, Vol. 70, N° 2, p. 193-225.
- Dreibelbis, D, Record, D (2006), *Increasing corporate audit committee to prevent fraud*, Regional Business news.
- Ewert, R, Wagenhofer, A (2005), *Economic effects of tightening accounting standards to restrict earnings management*, The Accounting Review, vol. 80, N° 4, p. 1101-1124.
- Glaeser, E, La Porta, R, Lopez-de-Silanes, F, Shleifer, A (2004), *Do Institutions Cause Growth?*, Journal of Economic Growth, Vol. 9, pp. 271-303.
- Hofstede, G.H (2014), *Dimensions of national cultures*, <http://geerthofstede.nl/dimensions-of-national-cultures>.
- Hofstede, G.H (2010), *Heritage Foundation reports*. <http://www.heritage.org/Research>.
- Hofstede, G.H (1980), *Culture's Consequences: international differences in Work-Related Values*. Sage, Thousand Oaks, CA.
- Hofstede, G.H (2001), *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*, second ed. Sage, Thousand Oaks, CA.

- Jeanjean, T, Stolowy, H (2008), *Do accounting standards matter? An exploratory analysis of earnings management before and after IFRS adoption*, *Journal of accounting and public policy*, vol. 27, p. 480-494.
- Jennings, R, Mayhew, W, Tse, S (2004), *Do international accounting standards increase the timeliness and value-relevance of financial statement disclosure?* Working paper, University of Texas at Austin.
- Jensen, M.C, Meckling (1976), *Theory of the firm: managerial behavior, agency costs and ownership structure*, *Journal of financial economics*, vol. 3, N° 4, p. 305-360.
- Jiang, W, Lee, P, Anandarajan, A (2008), *The association between corporate governance and earnings quality: Further evidence using the Gov-Score*, *Advances in Accounting*, vol. 24, N° 2, p. 191-201.
- Klein, A (2002), *Audit committee, board of director characteristics, and earnings management*, *Journal of Accounting and Economics*, vol. 33, Issue 3, p. 375-400.
- Krishnakumar, J, Nagar, A.L (2008), *On exact statistical properties of multidimensional indices based on principal components, factor analysis, MIMIC and structural equation models*, *Soc Indic Res*, vol. 86, p. 481-496.
- Kroeber, A.L, Kluckhohn, C (1952), *Culture a critical review of concepts and definitions*, New York, Vintage Books.
- Larcker, D.F, Richardson, S, Tuna, I (2007), *Corporate governance, accounting outcomes, and organizational performance*, *The Accounting Review*, vol. 82, No 4, p. 963-1008.
- Leuz, C, Nanda, D, Wysocki, P (2003), *Earnings management and investor protection : An international comparison*, *Journal of Financial Economics*, vol. 69, p. 505-527.
- Licht, A.N (2001), *The mother of all path dependencies : Toward a cross-cultural theory of corporate governance systems*, *Delware Journal of Corporate Law*, vol. 26, N° 1, p. 147-205.
- Licht, A.N, Goldschmidt, C, Schwartz, S.H (2005), *Culture, law and corporate governance*, *International Review of Law and Economics*, vol. 25, p. 229-255.
- Licht, A.N, Goldschmidt, C, Schwartz, S.H (2007), *Culture rules: The foundations of the rule of law and other norms of governance*, *Journal of comparative economics*, vol. 35, p. 659-688.
- Lin, H, Paananen, M (2009), *The development of accounting quality of IAS and IFRS over time: The case of Germany*, *Journal of International Accounting research*, vol. 18, N° 1, p. 31-55.
- Lobo, G.J, Zhou, J (2006), *Did conservatism in financial reporting increase after the Sarbanes-Oxley Act? Initial evidence*, *Accounting horizons*, vol. 20, N° 1, p. 57-73.
- Lobo, G.J, Zhou, J (2009), *Changes in discretionary financial reporting behavior following the Sarbanes-Oxley Act*, *Journal of Accounting, Auditing and Finance*.
- Marra, A, Mazzola, P, Prencipe, A (2011), *Board monitoring and earnings management pre and post IFRS*, *International Journal of Accounting*, vol. 46, N° 3, p. 205-230.
- Mbenda, S.P.M, Edson, N.S (2012), *Capital social et gouvernance des PME Camerounaises*, *Investment Climate and Business environment Research Fund*, Rapport de Recherche du FR-CIEA N° 25/12.

- Nagar, A.L, Basu, S.R (2002), *Weighting socio-economic indicators of human development: a latent variable approach*. ULLAH et al. (org.). *Handbook of applied econometrics and statistical inference*. New York: Marcel Dekker. Cap. 29.
- Nurunnabi, M (2015), *The impact of cultural factors on the implementation of global accounting standards (IFRS) in a developing country*, *Advances in Accounting, incorporating Advances in International Accounting*, Vol. 31, p. 136-149.
- Peasnell, K.V, Pope, P.F, Young, S (2005), *Board Monitoring and Earnings Management: Do Outside Directors Influence Abnormal Accruals?*, *Journal of Business Finance and Accounting*, vol. 32, N° 7- 8, p. 1311-1346.
- Pluchart, J.J. (2010), *RSE et reporting societale*, *Chapitre de N.Berland et F.X. Simon (dir.)*, *Le Controle de gestion en mouvement*, Ed, IE, 2009.
- Rezaee, Z, Jain, P.K (2004), *The Sarbanes Oxley Act of 2002 and Accounting conservatism*, SSRN Working paper 554643.
- Schipper, K (2005), *The introduction of International Accounting Standards in Europe: Implications for International Convergence*, *European Accounting Review*, vol. 14, N° 1, p. 101-126.
- Shen, C.H, Chih, H.L (2007), *Earnings management and corporate governance in Asia's emerging markets*, *Corporate governance: An international review*, vol. 15, N° 5, p. 999-1021.
- Soderstrom, N, Sun, K (2007), *IFRS adoption and accounting quality: a review*, *European Accounting Review*, vol. 16, N° 4, p. 675-702.
- Stulz, R.M, Williamson, R (2003), *Culture, openness, and finance*, *Journal of Financial Economics*, vol. 70, p.313-349.
- Taras, v, Rowney, J, Steel, P (2009), *Half a century of measuring culture: approaches, challenge, limitations and suggestions based on the analysis of 112 instruments for quantifying culture*, *Journal of International Management*, vol. 15, N° 4, p. 357-373.
- Taras, V, Steel, P, Kirkman, B.L (2012), *Improving national cultural indices using a longitudinal meta-analysis of Hofstede's dimensions*, *Journal of World Business*, vol. 47, p. 329-341.
- Tendeloo, V, Vanstraelen, A (2005), *Earnings management under German GAAP versus IFRS*, *European Accounting Review*, vol. 14, N° 1, p. 155-80.
- Veron, N, Autret, M, Galichon, A (2004), *L'information financiere en crise, comptabilite et capitalisme*, *Editions Odile Jacob*.
- Wang, Y, Campell, M (2012), *Corporate governance, earnings management and IFRS: empirical evidence from chines domestically listed companies*, *Advances in Accounting, Incorporating Advances in International Accounting*, vol. 28, p. 189-192.
- Weinstein, O (2010), *Pouvoir, finance et connaissance, les transformations de l'entreprise capitaliste entre XX-e et XXI-e siecle*, *Editions La Decouverte Paris*, p. 196.
- Xie, B, Davidson, W.N, Dadalt, P.J (2003), *Earnings management and corporate governance: The role of the board and the audit committee*, *Journal of corporate Finance*, Vol. 9, Issue 3, p. 295-316.
- Zghal, D, Chtourou, S, Sellami, Y (2011), *An analysis of the effect of mandatory adoption of IAS/IFRS on earnings management*, *Journal of International Accounting, Auditing and taxation*, vol. 20, N° 2, p. 61-72.

Appendix

Table 5

Number of companies selected per country

Pays	Nombre de sociétés cotées retenu
Germany	30
Austria	27
Belgium	31
Danemark	30
Spain	30
Finland	28
France	30
Greece	30
Ireland	31
Italy	30
Netherlands	30
Portugal	19
United Kingdom	30
Sweden	30
Switzerland	33

Internal governance mechanisms attributes**Board of directors**

B1 : The board of directors size.

B2 = 1 if independent, non-executive directors account for more than 50 % of the board; 0 otherwise.

B3 = 1 if spilt between Chairman and CEO roles, 0 otherwise.

B4 = 1 if the Chairman is an independent, non-executive director, 0 otherwise.

B7 = 1 if the company has a nomination committee; 0 otherwise.

B8 = 1 if the chairman of the nomination committee is a non-executive director or the chairman of the board; 0 otherwise.

B9 = 1 if the majority of the members of the nomination committee are independent non-executive directors; 0 otherwise.

B11 = 1 if there is a nomination committee charter

B12 = 1 if board of directors meets at least 4 times per year; 0 otherwise.

B13 = 1 if all directors attended 75 % of board meetings or had a valid excuse; 0 otherwise.

B16 = 1 if Governance guidelines are publicly disclosed; 0 otherwise.

B17 = 1 if Code of ethics is publicly disclosed; 0 otherwise.

Audit committee

A1 = 1 if the company has an audit committee; 0 otherwise

A2 = 1 if all the members of the Audit committee are independent non-executive directors; 0 otherwise.

A3 = 1 if the chairman of the audit committee is a non-executive director; 0 otherw.

A4 = 1 if the audit committee meets at least 3 times per year.

A5 = 1 if financial expert. At least one member of the audit committee has recent and relevant experience; 0 otherwise.

A7 = 1 if disclosure of how much the company pays for audit fees to the auditor; 0 otherwise.

A8 = 1 if there is an Audit committee charter.

Remuneration committee

R1 = 1 if the company has a remuneration committee; 0 otherwise.

R2 = 1 if The members of the remuneration committee are all independent non-executive directors; 0 otherwise.

R3 = 1 if The chairman of the remuneration committee is a non-executive director or the chairman of the board; 0 otherwise.

R4 = 1 if The company's annual report contains a statement of the remuneration policy; 0 otherwise.

R8 = 1 if There is a Remuneration committee charter; 0 otherwise.

Shareholders rights and transparency of published informations

T1 = 1 if Detailed disclosure of financial and operating results; 0 otherwise.

T2 = 1 if Disclosure of strategic issues; 0 otherwise.

T3 = 1 if Disclosure of corporate targets and prospects; 0 otherwise.

T4 = 1 if Disclosure of the Articles of Association; 0 otherwise.

T5 = 1 if Investors and financial analysts are equally informed via internet and also in English; 0 otherwise.

T7 = 1 if The Annual Report includes a forecast of the company's profitability in the next business year; 0 otherwise.

T10 = 1 if Disclosure of the share ownership of the executive management staff members; 0 otherwise.

Ownership structure

OW1 = Fraction of common shares held by the largest shareholder.

OW2= Fraction of common shares held by the largest to the fifth shareholder

OW4= Fraction of common shares held by institutionnel investors.

Table 6

Total variance explained

Comp	Eigenvalues initials			Extraction Sum of Squares of selected factors			Sum of squares of factors retained for rotation		
	Total	%var	% cum	Total	% var	% cum	Total	%var	% cum
1	6.387	18.785	18.785	6.387	18.785	18.785	3.808	11.199	11.199
2	2.812	8.270	27.055	2.812	8.270	27.055	2.974	8.746	19.945
3	2.212	6.507	33.561	2.212	6.507	33.561	2.890	8.500	28.446
4	1.879	5.528	39.089	1.879	5.528	39.089	2.065	6.072	34.518
5	1.733	5.096	44.186	1.733	5.096	44.186	1.869	5.498	40.016
6	1.571	4.619	48.805	1.571	4.619	48.805	1.812	5.329	45.345
7	1.549	4.556	53.361	1.549	4.556	53.361	1.615	4.749	50.094
8	1.510	4.440	57.801	1.510	4.440	57.801	1.575	4.633	54.727
9	1.260	3.707	61.508	1.260	3.707	61.508	1.433	4.215	58.942

10	1.118	3.289	64.797	1.118	3.289	64.797	1.426	4.193	63.135
11	1.025	3.016	67.813	1.025	3.016	67.813	1.344	3.953	67.088
12	1.004	2.954	70.767	1.004	2.954	70.767	1.251	3.679	70.767
13	.911	2.678	73.446						
14	.885	2.602	76.047						
15	.878	2.583	78.630						
16	.837	2.461	81.091						
17	.739	2.173	83.264						
18	.679	1.998	85.262						
19	.618	1.818	87.080						
20	.533	1.568	88.648						
21	.489	1.438	90.086						
22	.460	1.354	91.440						
23	.415	1.220	92.660						
24	.392	1.153	93.812						
25	.351	1.031	94.843						
26	.327	.961	95.804						
27	.303	.890	96.694						
28	.272	.799	97.493						
29	.219	.643	98.136						
30	.187	.551	98.687						
31	.157	.462	99.149						
32	.122	.358	99.506						
33	.101	.297	99.803						
34	.067	.197	100.000						

Méthode d'extraction : Analyse en composantes principales.