Accounting and Management Information Systems
Vol. 18, No. 2, pp. 262-282, 2019
DOI: http://dx.doi.org/10.24818/jamis.2019.02005

The profile of IPSAS-adopters

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Abstract

Research question: What is the general profile of countries adopting IPSAS in accounting, institutional and economic terms? ***Motivation:*** IPSAS are perceived as the benchmark of public sector's accounting standardization. Their adoption becomes highly promoted by several institutional organizations such as the World Bank and the IMF. Following previous literature review about IPSAS-adoption, researchers focused on only both factors (Ilie & Miose, 2012) and effects (Christiaens *et al.*, 2015; Opanyi, 2016) of the use of these standards. Hence, this study focus on the specificities of IPSAS-adopters. **Idea:** This research aims to determine the profile of countries adopting IPSAS internationally for the year 2016. Also, it suggests an empirical treatment of countries' economic risk. Indeed, this axis was not treated by previous IPSAS researches. Thus, we add to the literature review by analyzing, empirically the profile of IPSAS-adopters. ***Data:*** Data sources are the World Bank, the FMI and IPSAS Board. Moreover, we propose two new measures for the public-market security and for the accounting-system's modernization and transparency. ***Tools:*** A logistic regression is applied to test the theoretical hypotheses. Then, the test of marginal effect was applied in order to detect the most common character among IPSAS-adopters. ***Findings:*** The result of the empirical study showed that IPSAS-adopters have a modern accounting system based on accruals. These countries have a flexible legal system and an internationally legitimated private accounting system based on IFRS. However, there is any relationship between "IPSAS-adoption" and "the public-market's security". Moreover, the test of marginal effect indicates that the most widely character among IPSAS-adopters the use of IFRS. ***Contribution:*** Determining IPSAS-adopters' profile is a new research's axis. It is useful for countries' stakeholders that look for accounting, institutional and economic profiles of these entities.

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Keywords: Accounting, public sector, IPSAS, profile, contingency model.

JEL codes: M41

1. Introduction

Subprime crisis had led to an increase in the level of public debt, linked to an increase in the amount of expenditure incurred to support economy and banking system in some European countries. Hence, that causes Sovereign Debt Crisis (Muller-Marquès, 2012). Debt burden is now a risk factor for all countries that appear weakened by sovereign debt crisis. This crisis is due to the poor quality of public and private sector financial reporting as well as to the lack of harmonization of accounting practices and standards (Ernest and Young, 2013; Lüder, 2002; Brusca *et al.*, 2016).

The complexity of public sector requires the adoption of specific standards for its accounting management. International Public-Sector Accounting Standards Board (IPSASB) has tried to adapt standardization to the needs of public entities in international context and that finished by promoting international public Sector Accounting Standards (IPSAS) (IPSASB, 2014). This is the main interest of national governments and international institutions (Brusca & Martínez, 2016). In the light of these arguments, this article aims to analyze different profiles of IPSAS-adopters in order to answer to following question: What is the general profile of countries adopting IPSAS in accounting, institutional and economic terms?

There are few studies in this area. In fact, all previous researches on IPSAS has focused on the factors of their adoption (Hamisi, 2012; Kiugu, 2010; ICPAK, 2014), their impact (Grossi & Soverchia, 2011; Lüder & Jones, 2003; Caperchione & Mori, 2013; Christiaens *et al.*, 2015; Opanyi, 2016; Ball, 2012) or comparative studies (Brusca & Condor, 2002; Benito *et al.*, 2007; Christiaens *et al.*, 2010; Christiaens *et al.*, 2015; Opanyi, 2016). This article focused on the public sector because the latter has not been widely treated by researchers, unlike the private sector. As a result, it becomes urgent to concentrate our efforts on the specific characteristics of this sector and on the development of its international accounting standardization in order to propose recommendations to help its improvement. The selection of the profiles to be studied was based on Lüder's contingency model (2002), which proposes the most decisive factors in the implementation of public sector reforms. Furthermore, the "Sovereign Debt Crisis" was addressed theoretically in the research work on IPSAS-adoption, especially in the European and OECD context. However, in this research study, we will take the initiative to examine it empirically.

The empirical contribution of the article also lies in the measures of our explanatory variables. Indeed, we tried to use public data to determine the economic profile of countries.

The study includes all the countries in the world whose information is available, 168 countries, in order to make the sample more representative and heterogeneous. The results of the empirical study showed that IPSAS-adopters have an accrual-based public accounting system. These countries have a flexible legal system governed by "common-law" and an internationally harmonized private accounting system which is based on the IFRS-adoption. These results demonstrate that the majority of countries adopting IPSAS have a culture of harmonization and tend to become familiar with internationally accepted accounting standards like IFRS and IPSAS. However, it is interesting to note the lack of a relationship between "IPSAS-adoption", "the financial and legal security of public market investors" and the "economic and financial situation of the country".

This article will be organized as the following. The first part will enumerate the previous research focusing on factors of both public-sector reforms and IPSAS-adoption in order to identify the different profiles of this study. Then, we will empirically test our theoretical hypothesis and discuss the regression's result.

2. Literature review: IPSAS-adoption and countries' profile

Global financial crisis and public-sector's reforms are combined with contingency model of Lüder (2002), to detect the general profile of IPSAS-adopters in accounting, institutional and economic order. The specificities of public-sector and even the contingency model of Lüder (2002) point out that IPSAS-adoption is due to cultural, legal, governance, technological and economic risk factors.

2.1 Public management reform and international accounting standards

2.1.1 New public financial management and public accounting system quality

There are several managerial changes in the public sector. At first, the New Public Management (NPM) appears to promote the shift from cash to accrual accounting for better reliability and relevance (OECD, 1990-1993).In fact, The use of accruals reflects the governments' awareness about the importance of an informative, transparent and reliable accounting model (Opanyi, 2016). Recently, another reform appears promoting the International Public Sector Standards (IPSAS). These standards were crucial to ameliorate the quality of financial reporting in public-sector (Adhikari & Mellemvik, 2010; Alesani *et al*., 2012; Navarro &

Rodríguez, 2007-2011). International organizations (OECD, European Commission, World Bank, International Monetary Fund (IMF), Asian Development Bank) have, already, encouraged countries to adopt IPSAS (Grossi & Soverchia, 2011). Chan (2006) emphasized the relationship between IPSAS and NPM. He found that countries, which do not tend to make changes in their accounting systems, will not tend to change their standardization.

On the other hand, the majority of IPSAS are based on accrual accounting. Hence, this type of accounting system facilitates the adoption of these international standards. Indeed, previous IPSAS may lose its standardization authority because of its unfamiliarity with budgetary accounting (Christiaens *et al*., 2015; Ilie & Miose, 2012). Nevertheless, several countries using accrual accounting system do not adopt IPSAS, such as the Anglo-Saxon countries. Indeed, these countries have an accrual accounting system in their central and local governments but they adopt IFRS because of their international recognition (Christiaens *et al*., 2015; Pina *et al.*, 2009). Similarly, the United States has its own accrual-basis system, either the Governmental Accounting Standards Board "GASB" for local authorities or the Federal Accounting Standards Advisory Board "FASAB" for the central government.

H1: There is a positive association between IPSAS-adoption and accrual accounting system.

2.1.2 Accounting system standardization

On the one hand, the power of country-specific business accounting rules may inhibit IPSAS compliance process, even if IFRS-based, as this requires cultural change (Christiaens *et al*., 2010-2015). The above is also highlighted by Oulasvirta (2014) in his analysis of the Finnish Government's assessment of IPSAS and their final rejection using an institutional context (Christiaens *et al*., 2015; Muller-Marqués, 2012). Several countries refer to their own private accounting standards for setting public sector standards (Christiaens *et al*., 2010). Indeed, if they are based on IFRS, they will ultimately be IPSAS-compliant, because IPSAS are based on IFRS (Christiaens *et al*., 2015; Ilie & Miose, 2012; Brusca & Martínez, 2016). However, many countries avoid IPSAS adoption because these are relatively unknown than IFRS (Jones & Caruana, 2016).

On the other hand, public accounting is the accounting of the government itself. That's why the adoption of international standards may probably annoy the country's sovereignty (Caperchione & Mori, 2013). Thus, using IFRS in its private-sector shows that the country may adopt globally legitimate standards in its public sector as IPSAS (Judge *et al*., 2010). According to institutional theory, seeking legitimacy may affect organization's behavior (Dillard *et al*., 2004; Meyer & Rowan, 1977; Powell & DiMaggio, 1991) which is often important in national decision-making.

H2: There is a positive association between IPSAS-adoption and IFRS-use.

2.2 Institutional system allowing IPSAS adoption

The development of the public accounting system depends on many institutional and environmental factors (Brusca & Condor, 2002; Pina & Torres, 2003; Christiaens *et al.*, 2015). In fact, the main institutional factors influencing the reform of current and future international accounting systems are legal and governmental ones (Nobes, 1991; Pina *et al*., 2009; Zeff, 2012).

2.2.1 Legal system

Lüder's contingency model (2002) asserted the impact of the legal system on accounting reform because most countries integrate characteristics of one or the other in their own legal systems (Rakoto & Lande, 2008). Christiaens *et al*. (2015) have shown that seeking IPSAS implementation is stronger in countries with flexible legislative systems (Adhikari & Mellemvik, 2010; Caperchione & Mori, 2013). Indeed, the adoption of IPSAS and IFRS, in Anglo-Saxon countries, is due to the "principle-based" nature of these standards, which is the feature of these common-law based countries. They do not have neither strict legal definition nor regulated accounting requirements, as the case in continental European countries and their colonies (Lüder, 2002). In fact, European countries use their own "harmonized standards in established Law" called EPSAS, which makes IPSAS implementation more cumbersome. Thus, the absence of strict rules and requirements generates external pressures that facilitate the reform of the accounting system.

From another angle, some common-Law based countries do not adopt IPSAS such as the United States (Brusca *et al*., 2016). However, they develop their own standards based on IPSAS. Therefore, contradictory research findings from which we propose the following hypothesis:

H3: There is a positive association between IPSAS adoption and legal-system's flexibility.

2.2.2 Governance system: Public market's security

IPSAS-adopters accord a big importance to their stakeholders, as well as, to their investors and donors. Indeed, Opanyi (2016) asserted that in Madagascar, IPSAS-adoption meets the expectations of donors seeking for financial transparency. Similarly, Christiaens *et al*. (2015) & Opanyi (2016) pointed out the importance of international harmonization throughout the opening up to the international market. Indeed, this harmonization improves the satisfaction and the security of the investors and the creditors because it leads to the comparability of financial information (Caperchione & Salvatori, 2012). Caperchione and Mori (2013) also confirmed this idea on the context of the five countries: France, Germany, Spain, Switzerland, and Italy. To protect themselves, investors of capital and public debt consider the financial guarantees provided by the country in order to restore confidence and to protect the financial markets' stability.

H4: There is a positive association between IPSAS-adoption and public-market's security.

2.3 IPSAS adoption and country's economy

According to the theory of resource dependency, the adaptation process of accounting practices is more current in countries with higher external-resources dependency (Powell & DiMaggio, 1983; Pfeffer & Salancik, 1978). Indeed, globalization and the multicity of economic partners generate resource dependency, which affects the government's behavior.

2.3.1 Economic risk

All previous studies on IPSAS (Benito *et al*., 2007; Chan, 2006; Brusca & Condor, 2002; Christiaens *et al*., 2010-2015; Opanyi, 2016; Kiugu, 2010; Muller-Marqués, 2012; Ilie & Miose, 2012; Grossi & Soverchia, 2011; Lüder & Jones, 2003) highlighted the effect of financial crisis on IPSAS-adoption without any empirical verification. These studies asserted that following the Greek and Kenyan debt crisis, regularization bodies (IMF, European Parliament and World Bank) enforce countries to adopt IPSAS such as the cases of Greece, Kenya and Cameroon (Opanyi, 2016; Ilie & Miose, 2012). The adoption of these standards was important for these countries in order to improve the quality, relevance, timeliness and fair presentation of their public sector financial reports (Opanyi, 2016; Christiaens *et al*., 2015; Ilie & Miose, 2012; IPSASB, 2014).

Historically, IPSAS aimed to improve the quality of financial reporting on the country's debt levels and fiscal sustainability (Muller-Marqués, 2012; Ball, 2012). In addition, some countries adopting IPSAS (or converging standards) are economically sustainable such as Spain (Ilie & Miose, 2012) and Latin America (Brusca *et al*., 2016). Indeed, these countries are still seeking to improve their accounting practices to facilitate management, fiscal sustainability and macroeconomic balance policy formulation.

According to these studies, it was not possible to detect the economic situation of countries adopting IPSAS. Hence, we propose the following hypothesis:

H5: There is a positive association between IPSAS adoption and the country's economic risk.

2.3.2 Financial dependence

According to accounting theories and contingency model (Lüder, 2002), the accounting reform is strongly influenced by the country's history, culture, economy and legal system (Christiaens *et al*., 2015; Brusca & Martínez, 2016). The adoption of IPSAS has never been mandatory, unless in the case of a higher financial dependency. Indeed, highly indebted countries tend to apply external requirements and adopt the recommended standards (Opanyi, 2016; Christiaens *et al.*, 2010; Rakoto & Lande, 2008).

Moreover, rich Arab countries such as Oman, Kuwait, and Bahrain do not publish financial information on their public-sectors, unlike all GOLF countries are required to publish government documents (Abushamsieh *et al*., 2014) since these countries are economically huge. Their citizens and international organizations exert less control on their public funding. However, countries receiving international aid, such as Egypt, Jordan and Palestine, are perceived as less developed because of their financial dependence. Therefore, they are obliged to publish their governmental documents (Abushamsieh *et al.*, 2014 ; Werlin, 2005). These results show the relation between the resource dependence theory and IPSAS adoption. In fact, Pfeffer and Salancik (1978) believe that countries that are highly financially dependent tend to satisfy to their stakeholders' requirements, unlike independent countries (Rakoto & Lande, 2008; Kiugu, 2010; Hamisi, 2012; Abushamsieh *et al*., 2014)

H6: There is a positive relationship between IPSAS adoption and country's financial dependency.

3. Methodology

3.1 Sample and study period

This paper is a cross-sectional study that carried out to detect the country's general profile during 2016, in the international context. This year's choice makes our study more updated and more reflecting the reality and economic and political news of the countries in our sample.

Although our total sample consists of 199 countries from all over the world, our final sample consisted only 168 countries due to the problem of data availability. The sample consists of two groups. In fact, the first group in our sample includes 88 countries that are adopting IPSAS and countries adopting converging accounting standards. However, the second group in our sample includes 80countries that do not take IPSAS into account in their public-sector accounting standards.

The separation between these two groups does not take into account the level of IPSAS adoption, because the application of these standards is a long process and it is not implemented directly.

Table 1 : Sample distribution

Standardization strategy	IPSAS		Total
	Adoption/ convergence	Non-adoption	
Number	88 countries	80 countries	168 countries
Percentage	48%	52%	100%

3.2 Source of data

The data for this study were extracted from various primary sources (members of the standardization bodies such as IPSASB and IASB, World Bank) and secondary sources (previous articles). Other data that are not disclosed on the Internet have been collected from those responsible for Europe Direct and IPSASB.

3.3 Presentation of the empirical model and study variables

3.3.1 Country's classification and measurement of the dependent variable

The emergence of IPSAS is a very important development in public accounting. However, their adoption by governments is voluntary, as IPSASB does not have the power to compel a jurisdiction to adopt them (Christiaens *et al.*, 2015; Muller-Marqués, 2012). That's why there is a heterogeneous international public accounting system. In this case, in order to properly classify the countries in a sample, we used the accounting definition of the concept of Adoption. This is a "process of integrating the criteria of international standards into local regulations" (Pacter, 2005). In other words, this process presupposes the coexistence of different sets of standards, but with criteria that "converge" towards the same principles (Bietenhader & Bergmann, 2010; Brusca & Martínez, 2016). This means that countries having accounting standards converging on IPSAS may also be considered as adopting countries. Therefore, we selected a dichotomous dependent variable «IPSASA».

IPSASA	= 1: if the country adopts IPSAS = 0: otherwise

3.3.2 Presentation of the empirical model

Based on the literature review synthesis, we identify the factors influencing the adoption of IPSAS to determine the overall accounting, institutional and economic profile of countries adopting IPSAS. The proposed study model is a logistic regression model:

$$IPSASA_i = \alpha_0 + \alpha_1 Cash\_Accrual_i + \alpha_2 IFRSA_i + \alpha_3 LAW_i + \alpha_4 RLGS_i + \alpha_5 LogPubDebt_i + \alpha_6 LogGNIppp_i + \varepsilon_i$$

Notes:

- i = country; α_0 = constant; ε_i = error term
- $IPSASA_i$ = 1 if the country adopts IPSAS and 0 otherwise.
- $Cash\_Accrual_i$ = 1 if the country uses accrual accounting system and 0 otherwise.
- $IFRSA_i$ = 1 if the country adopts IAS/IFRS in its private sector and 0 otherwise.
- LAW_i = 1 if the country's legal system is "common Law" and 0 otherwise.
- $RLGS_i$ = Index of the robustness of legal guarantees provided by the State: from « 0 » to « 12 »
- $LogPubDebt_i$ = Public debts / GDP
- Log $GNIppp_i$ = logarithm of the country's gross national incomeper capital, PPP (current international $).

3.3.3 Independent variables: Measurement and theoretical expectation

The variable "Public-market’s security" will be measured, for the first time, by an "index of the robustness of legal guarantees provided by the state" which varies between "0" and "12". This index is available on the World Bank website. It is calculated on the basis of data measuring trade-regulation, regulatory outcomes and the extent of the legal protection of assets, the flexibility of employment regulation and the tax burden on all businesses in all sectors of the country. This variable determines whether investors in the country's public or private-sector are financially and legally protected or not, considering that economic activity requires good rules and adequate regulations which are accessible to all who need them.

Otherwise, the measure of the « Economic Risk » is based on Maastricht Stability and Growth Pact. Under this pact, the article number 126 TF and the Protocol number 12 on the excessive deficit procedure (EDP), annexed to the Treaties, European countries are not allowed to have a debt-to-GDP ratio of more than 60% (Muller-Marquès, 2012; Christiaens *et al.*, 2015; Brusca *et al*., 2016). An increase in this ratio is seen as a sign of a country's poor economic stability, as its growth is generally reflected in an increase in public debt. If the debt ratio (public debt/GDP) exceeds 60%, the country is at risk of not to be able to repay its debts as in the case of Greece, Kenya. The increase in this ratio alerts a sovereign financial crisis.

For the measurement of « financial dependency » which is based on the country's development, we referred to previous research such as that of (Van der Laan *et al*., 1992; Belkaoui, 1983, Doidge *et al*., 2007). These research studies measured the country economic development by gross national into studies measured (GNI) per capita. According to these researchers, the reflection of a country's economic development is the size of its domestic market (Hope *et al*., 2006; Christiaens *et al*., 2015; Van der Laan *et al*., 1992). The following table 2 summarizes our model's variables and their expected sign, measurement, and sources.

Table 2: Summary of dependent variables and their theoretical relationship with IPSAS adoption

Profiles	Variables	Notifications	Measures	Sources	Expected sign
Accounting profile	Accounting system type	Cash_accrual	dichotomous variable: = « 1 » if the country uses the accrual accounting; otherwise « 0 ».	IPSASB	+
	IFRS adoption	IFRSA	dichotomous variable: = « 1 » if the country is an IFRS-adopter in its private sector; otherwise « 0 ».	IASB	+
Institutional profile	Flexibility of legal system	Law	dichotomous variable: = « 1 » if the legal system is based on the « common Law »; otherwise « 0 ».	2[ed] source	+
	Public-market security	RLGS	Index of robustness of legal guarantees provided by the State: from « 0 » to « 12 »	World bank	+
Economic profile	Economic risk	LogPubDebt	dichotomous variable: = Public debts/ GDP	World bank	+
	Financial dependency	LogGNIppp	Logarithm of the country's gross national income (GNI) per capital, PPP (current international $)	World bank	-

4. Analysis and discussion of results

4.1 Descriptive statistics and correlation analysis

The Results of the Pearson correlation (table 3) shows that there is no multi-colinearity problem between the explanatory variables of our model. The correlation coefficients of these variables between -0.0198 to 0.3239 (less than 0.8). Furthermore, the result of the VIF test (table 3) shows that all the independent variables of our model have a value of (1/VIF) greater than 0.1 with a VIF Mean (1.10) greater than 1 and less than 4. Thus, the independent variables have an important explanatory power against the dependent variable (IPSASA).

Table 3: Summary of the Pearson Correlation matrix and the VIF test

Variables	Cash_Accual	LAW	IFRSA	RLGS	LogPubDebt	LogGNIppp	1/VIF
Cash_Accrual	1						0.860
LAW	0.086	1					0.922
IFRSA	0.323	0.246	1				0.832
RLGS	0.170	0.138	0.119	1			0.913
LogPubDebt	0.041	0.085	0.118	-0.114	1		0.960
LogGNIppp	0.093	-0.019	-0.043	-0.143	0.064	1	0.958
VIF Moyenne = 1.10							

Note: IFRSA = IFRS adoption, Cash_Accrual = accounting system type, Law = flexibility of the legal system, RLGS= Robustness of legal guarantees provided by the State, LogGNIppp = Logarithm of GNI per capital PPP (current international $), LogPubDebt = Economic risk.

The results of the descriptive statistics show that the Means of IFRSA, Law, Cash_Accrual and RLGS are higher in countries adopting IPSAS. In addition, the Means of LogPubDebt and LogGNIppp are lower for countries adopting IPSAS (table 4).

Table 4: Descriptive Statistics results

	IPSAS-adopters IPSASA = 1 N = 88				Non IPSAS-adopters IPSASA = 0 N = 80			
	Mean	Std Dev	Min	Max	Mean	Std Dev	Min	Max
Cash_Accrual	0.78	0.41	0	1	0.57	0.49	0	1
IFRSA	0.87	0.33	0	1	0.58	0.49	0	1
Law	0.39	0.49	0	1	0.20	0.40	0	1
RLGS	5.70	2.82	0	12	4.83	2.74	0	12
LogPubDebt	0.35	0.48	0	1	0.38	0.49	0	1
LogGNIppp	4.82	0.99	1.82	7.33	5.01	0.88	2.81	7.27

Note: IFRSA = IFRS adoption, Cash_Accrual = accounting system type, Law = flexibility of the legal system, RLGS = Robustness of legal guarantees provided by the State, LogGNIppp = Logarithm of GNI per capital PPP (current international $), LogPubDebt = Economic risk.

4.2 Verification of the conditions of validity of the empirical model

According to the validity criteria of our econometric model presented in the 5th table,the khi-2 is significant at the 1% level, the R^2 of Nagelkerke is 16%, which is an acceptable level to judge the explanatory power of the model and the percentage of correctly ranked countries is 53% for our empirical model. Thus, we admit that our model is globally significant and that there is a relationship between the independent variables and the dependent one.

Table 5: Validity criterion

Validity criterion	Value
Khi-2	26.38
Value of « p »	0.00^{***}
R² Nagelkerke	16%
Correct percentage	53%

Note:
*: significant at the level of 10%
**: significant at the level of 5%
***: significant at the level of 1%

4.3 Analysis of the logistic regression result

The analysis of the results of the binary logistic regression allows us to define the different profiles of countries adopting IPSAS by confirming or refusing our six hypotheses.

Table 6 summarizes the results of the logistic regression. It shows that only three variables have a significant relationship with IPSAS adoption and that define the global profile of countries adopting IPSAS which are: the use of accrual-accounting (Cash_Accrual), flexibility of the legal system (LAW), and IFRS adoption (IFRSA).

Table 6: Binary logistic regression

Variables	**Coefficients**	**Significance**
Cash_Accrual	0.653	0.089^{*}
IFRSA	1.267	0.003^{***}
LAW	0.688	0.089^{*}
RLGS	0.052	0.439
LogPubDebt	- 0.358	0.316
LogGNIppp	-0.201	0.271
Constante	-0.657	0.537

Note:
IFRSA = IFRS adoption, Cash_Accrual = accounting system type, Law = flexibility of the legal system, RLGS = Robustness of legal guarantees provided by the State, LogGNIppp = Logarithm of GNI per capital PPP (current international $), LogPubDebt = Economic risk.

*: significant at the 10% level
**: significant at the 5% level
***: significant at the 1% level

4.4 Results' discussion and profiles' recognition

4.4.1 Accounting profile's variables of IPSAS-adopters

There is a positive and significant relationship at the 10% level between Cash_Accrual and IPSASA. This result is consistent with our first expectation that IPSAS-adpters have an accrual-based accounting system, which is the most modern accounting system (Christiaens *et al*., 2010-2015; Opanyi, 2016 and IPSASB, 2014). Many studies point out that the use of accrual accounting facilitates the access to IPSAS adoption because these standards are based on accrual-accounting, unless onnly one which is cash-based. Thus, IPSAS are unfamiliar with cash-accounting (Christiaens *et al*., 2010 - 2015). Besides, Chan (2006) explained that if the country does not participate in NPM, it will not change its accounting system, thus will not adopt IPSAS. Therefore, we conclude that several IPSAS-adopters have an accrual accounting system that is the benchmark of modernization and transparency.

The relationship between IPSASA and IFRSA is positive and significant at the 1% level, which agrees our second expectation that IPSAS-adopters use IFRS in their private sector. This result can be explained in two ways: theoretical and practical dimensions. At first, according to the institutional theory and legitimacy notion, IFRS-adopters tends to use internationally legitimated standards in their public and private sector such as IPSAS (Hamisi, 2010; Benito *et al*., 2007; Caperchione & Mori, 2013).

In the other hand, in practice, public and private accounting standards must converge to facilitate the consolidation of governmental financial statements. Thus, as Christiaens *et al*. (2010) have shown, some countries do not adopt IPSAS because they transfer their own private sector accounting standards to the public sector. Therefore, if they are based on IFRS, they will ultimately be IPSAS-compliant (Brusca & Martínez, 2016) which facilitates the adoption of IPSAS as they are based on IFRS.

4.4.2 Institutional profile's variables for IPSAS-adopters

Public accounting development depends on several institutional factors in legal and governance order (Brusca & Condor, 2002; Pina & Torres, 2003; Christiaens *et al*., 2015; Nobes, 1991; Pina *et al*., 2009; Zeff, 2012)

The relationship between LAW and IPSASA is positive and significant at the 10% level, confirming that IPSAS-adopters have flexible legal system based on "Common Law". The explanation of this results is that strict legal system may reveal accounting reforms. Indeed, it obstructs external requirements and new reforms in public and private sectors (Lüder, 2002; Lüder, 2002; Nobes, 1991)).

Research studies on institutional factors of IPSAS adoption indicate that the shift towards accrual accounting and IPSAS is stronger in countries with flexible legislative systems (Christiaens *et al*., 2015; Adhikari & Mellemvik, 2010; Caperchione & Mori, 2013; Muiu, 2010). Indeed, legal system flexibility ensures access to freedom and generates internal and external pressures pushing the accounting system to pursue universal reforms and changes (Lüder, 2002).

Public-market security «RLGS» is not related to IPSAS-adoption «IPSASA». This result is in contrast with our fourth hypothesis expecting a positive relationship between IPSAS adoption and public-market security. According to literature review, the harmonization of accounting standardization become crucial after the globalization. It ensures comparability of financial information across countries and protect public-sector's investors (Opanyi, 2016; Rakoto & Lande, 2008; Christiaens *et al*., 2010-2015; Muller-Marqués, 2012; Kiugu, 2010). Due to globalization, public sector opens up to private system. This led to the increase of its demand for credits and investors which are the main factors that counteract the divergence of public accounting systems in different countries (Lüder & Kampmann, 1993; Brusca & Condor, 2002; Benito *et al*., 2007). The explanation of our result may be because IPSAS-adopters tend to participate in globalization through their public sector but without providing sufficient guarantees (RLGS) to profile their investors.

4.4.3 Economic profile of IPSAS-adopters

There is any relationship between Country's economic risk (LogPubDebt) and IPSAS-adoption (IPSASA). Consequently, we dismiss the fifth hypothesis showing that countries adopting IPSAS are suffering from economic risk (Sovereign Debt Crisis).

All previous studies about IPSAS highlighted, theoretically, global financial crisis affected IPSAS-adoption, without any empirical treatment (Benito *et al*., 2007; Chan, 2006; Brusca & Condor, 2002; Opanyi, 2016; Kiugu, 2010; Muller-Marqués, 2012; Christiaens *et al*., 2010; Ilie & Miose, 2012; Grossi & Soverchia, 2011; Lüder & Jones, 2003). Several countries that suffered from sovereign debt crisis are imposed to adopt IPSAS or other converging standards such as Greece, Kenya, Cameroon (Opanyi, 2016; Tanjeh, 2016). These countries tried to improve their public management in order to reduce their public debts (Muller-Marqués, 2012). On the other hand, empirically, we found no relationship between IPSAS-adoption and sovereign crisis risk. Hence, we offer two different explanations.

Several research studies have shown that there are countries with high economic level who are adopting IPSAS (or have converged to IPSAS) such as the cases of Spain (Ilie & Miose, 2012; Rakoto & Lande, 2008), Romania (Ilie & Miose, 2012), Latin America (Brusca *et al*., 2016). These results demonstrate that countries "economically strong" tend to seek, continuously, to improve their accounting practices for better information quality, that's why they adopt IPSAS. Furthermore, it is impossible to deny that IPSAS adoption was essential for countries in sovereign crisis to improve the quality of their financial reporting. By adopting IPSAS, these countries have improved the relevance, timeliness, and presentation of their financial information (Opanyi, 2016; Christiaens *et al*., 2015; Ilie & Miose, 2012; IPSASB, 2014). They also moderate the quality of their public sector financial reports (Opanyi, 2016). We can, therefore, see that by adopting IPSAS, sovereign debt crisis countries will return to financial health through improving decision making and fiscal sustainability in terms of debt levels (Opanyi, 2016; Ball, 2012). These conclusions accuse the IPSAS-adoption to quickly improve the country's economic situation.

A worst economic management may create a sovereign debt crisis. Indeed, countries in crisis cannot act or invest because they are unable to finance their reforms and IPSAS implementation process. Consequently, the public sector in these countries will continue to suffer from a "backlog" of IT equipment and its use. This delay negatively affects the progress of the public organization and working conditions (Guillemot *et al*., 2011; Albert, 2013) as well as public sector development and standardization. It is also important to mention that the implementation of IPSAS standards is very expensive and requires a specific know-how, which will increase the possibility of their implementation in sovereign crisis countries (Christiaens *et al*., 2015; Hamisi, 2012; Kiugu, 2010; Chan, 2006).

Empirical result show that lack of relationship between financial dependency «GNIppp» and IPSAS-adoption « IPSASA », which contradicts our sixth hypothesis predicting that IPSAS-adopters are financially dependent. This result contrasts with previous research studies such as Opanyi (2016), Christiaens *et al*. (2010 - 2015), Rakoto and Lande (2008), Abushamsieh *et al*. (2014), Werlin (2005) and Brusca and Martínez (2016). These authors noted that IPSAS implementation has never been obligatory for highly indebted countries. Indeed, underdeveloped and developing countries financially dependent tend to apply external requirements and adopt recommended standards (Opanyi, 2016; Abushamsieh *et al*., 2014).

Moreover, financial economic dependence increases the country's exposure to external control and its obligation to publish its governmental documents with particular standards as IPSAS. However, these countries do not have resources to implement the process of adopting standard. Thus, empirically, we find any « financial dependence »and« IPSAS adoption » because of the high costs of public reform and IPSAS implementation. Besides, many studies about IPSAS adoption factors have mentioned that the cost factor has a negative impact on IPSAS adoption (Chan, 2006; Hamisi, 2012; Kiugu, 2010; ICPAK, 2014; Brusca & Martínez, 2016). According to Chan (2006), IPSAS adoption in developing countries, often, requires a huge investment in education and training to develop a new range of accounting skills. Unfortunately, this is not always possible in countries where governments have limited resources (Christiaens *et al*., 2015). The cost of setting up a new accounting system is very high (Brusca & Martíne, 2016; Kiugu, 2010). Indeed, the implementation of IPSAS requires an investment in IT and communication technology, such as the purchase of new software (Ilie & Miose, 2012; Christiaens *et al*., 2015). As a result, countries in crisis or even in a difficult economic situation are unable to implement IPSAS despite external pressures.

4.5 Discussion of the marginal effects of significant variables

The logistic regression table showed that only three variables are significant: the modernization and accrual-accounting-system (Cash_Accrual), the flexibility of the legal system (LAW), and IFRS adoption (IFRSA). In order to detect the most common profile among IPSAS-adopters, we test the marginal effects to determine the most important of each of these significant variables.
Table 7 shows that the variable "IFRSA" has the most important marginal effect on IPSASA. Therefore, the adoption of IFRS is the most common character among countries adopting IPSAS. In other words, the majority of countries adopting IPSAS are IFRS users. Thus, countries adopting IPSAS have the harmonization culture in their public and private accounting systems.

Table 7: Test of marginal effects of significant explanatory variables

Variables	Exp (b)
Cash_Accrual	1.502
LAW	1.596
IFRSA	2.628
RLGS	1.034
LogPubDebt	0.778
LogGNIppp	0.867
Constante	0.415

Note: IFRSA = IFRS adoption, Cash_Accrual = accounting system type, Law = flexibility of the legal system, RLGS = index of robustness of legal guarantees provided by the State, LogGNIppp = Logarithm of GNI per capital PPP (current international $), LogPubDebt = Economic risk.

5 Conclusion and main contributions

This paper aims to determine the global profile of IPSAS-adopters, for a sample of 168 countries, in 2016 to answer to the following problematic: What is the general profile of countries adopting IPSAS in accounting, institutional and economic terms? Previous studies on IPSAS adoption factors have served as the foundation for the theoretical basis of hypotheses concerning the different profiles of IPSAS-adopters. The selection of the studied profiles was the result of an inspiration from the economic and institutional determinants of public sector reforms, combined with the famous Lüder's contingency model (2002).

The results of the binary logistic regression showed that IPSAS-adopters has a modern and transparent accrual-based accounting system, a flexible legal system and an internationally harmonized private sector based on IFRS. However, there was any relationship between the "country’s public-market security" and the "IPSAS adoption". This result is explained by the flexibility of the legal system of countries adopting IPSAS, which is based on "Common Law". Indeed, this flexibility has a negative effect on the "index of country’s legal guarantees" .In addition, this article referred to the negative impact of the "Cost Factor" to explain the lack of significance of the relationships between the "adoption of IPSAS" and these variables "financial dependence" and "economic risk". Indeed, the "Cost" of public sector reform and IPSAS implementation can have a negative impact on the adoption of IPSAS, not only for "countries in economic crisis" but also for "developing countries" living under external pressure.

The test of the marginal effects on the explanatory and significant variables of the empirical model shows that the most relevant and remarkable profile of IPSAS-adopters is the "IFRS adoption". This result is in line with the theoretical studies on the determinants of IPSAS adoption that were prepared by Caperchione and Mori (2013), Judge *et al*. (2010), Christiaens *et al*. (2010), Hamisi (2012), Ilieand Miose (2012) and Ball (2012). As a result, it can be deduced that the majority of IPSAS-adopters have a culture of harmonization and tend to become familiar with internationally accepted accounting standards, such as IFRS and IPSAS.

Theoretically, this study contributes to the theoretical literature on the different profiles of IPSAS-adopters, because this axis untreated for the first time. In addition, the originality of this paper resides in the empirical treatment of the economic risk as a variable in the studied model, because previous research on IPSAS are limited to a theoretical treatment of the sovereign debt crisis.

Empirically, this article presented two new measures for the following variables: «modernization and transparency of the public sector" and "the index of country’s legal guarantees". At first, on the basis of the results and recommendations developed by academic research (developed by scientific researchers) and applied research (developed by international organizations), this article has made a new measure of country's modernization and accounting transparency at the disposal of future accounting researchers. Moreover, the following variable "the index of country’s legal guarantees to protect investors in its market" was integrated into our empirical model and measured by the index of the robustness of legal guarantees given by the state, which varies between "0" and "12".

Practically, the results of this article can be useful for all stakeholders who are looking for information on a country's accounting and institutional or economic profile, because this study covers the international context. In fact, this paper proves, empirically, that IPSAS adoption can provide information on the country's accounting system type by focusing on the modernization and transparency of its public-sector accounting system (whether the country is aware of accounting development or not). Also, the country's stakeholders are concerned about the type of their accounting standards (internationally harmonized practices that meet or do not meet international standards, adoption of IFRS or not). Similarly, these actors can deduce the type of the country's legal system (knowing whether the country has a strict or flexible constitution and regulations) by knowing whether it adopts IPSAS or not. In addition, international regularization organizations can use this study as a basis for diagnosing the financial and economic situation of a country before granting credit or imposing particular pressure on it.

Despite the conceptual, empirical and practical contributions of this research work, the latter has limitations that may be central to the opening of future debates. First of all, in this study, some countries were excluded from the final sample because of data availability problems. Only 168 countries were included in the study. In addition, this study is limited to examining the profiles derived from the contingency factors presented by Lüder (2002) and neglects other factors that may influence the decision to adopt IPSAS such as the political factor, the development of the accounting profession. Taking these factors into account may be a future research pathway to identify the profiles of countries adopting IPSAS. Finally, this article focuses on the different profiles of countries adopting IPSAS in a global manner without taking their degree of IPSAS adoption in consideration. This may open up a new area of future research to improve the results obtained in this work.

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