

Integration Level of Financial and Management Accounting Systems with the Accounting Convergence Process and the Effectiveness of Controllership

Abstract

This study aims to verify the integration level between the financial and management accounting systems as a result of the convergence process with the international accounting standards and of the effectiveness of controllership in Brazilian companies. A descriptive research was undertaken, based on the application of the questionnaire by Angelkort and Weißenberger (2011) to the 500 Best and Biggest of *Revista Exame*, issue 2011, using a sample of 32 companies that answered the research. The correlations between the integration level of the financial and management accounting systems and the variables “consistency of financial language”, “quality of services provided” and “degree of influence in decision making”, during the convergence period with the international accounting standards, were positive and moderate. It was also observed that the period before the accounting convergence (2004 till 2007) showed a better integration level of the financial and management accounting systems than the accounting convergence period (2008 till 2011). In conclusion, the accounting convergence process increased the integration level of the financial and management accounting systems in the investigated companies, as well as the effectiveness of controllership, particularly in the consistency of the financial language, in the quality of the services provided and in the influence of the controllers’ services on these companies’ decisions.

Key words: Integration of accounting systems. Accounting convergence process. Effectiveness of controllership.

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1. Introduction

The globalization of markets and economies around the world entailed changes in different areas. The elements that are being redefined include Accounting, which is characterized as a changing phenomenon. According to Taipaleenmäki and Ikäheimo (2009), financial and management accounting had to clearly evolve, with the convergence between both as one of the main characteristics of this change. This approximation derives from the adoption of the International Financial Reporting Standards – IFRS, which rest on concepts and measuring and disclosure bases that permit their use in both accounting branches.

The internationalization process of the accounting standards leads to the concept of integration of accounting systems (Angelkort & Weißenberger, 2011). According to Stolowy and Touron (1998, p.1), integrated accounting exerts a double impact in the organization, “in terms of information (which becomes more reliable, because of unity of the data source and availability of this source, timely and relevant) and in terms of changes in the accounting business process”.

In a research developed through the application of a questionnaire to British management accountants, Joseph, Turley, Burns, Lewis, Scapens and Southworth (1996) found that there is relation between the external financial reports, internal accounting and decision making. The authors verified that this happened under the influence of three main factors: the regulation and external standards of the financial statements; the accounting systems used for decision making; and the influence of the external auditors.

When considering these factors in the current context, it is speculated that its relation tends to continue, as the accounting systems used in the organizations’ daily reality are increasingly interconnected. This may indicate that the information and reports the companies use connect processes from different areas and departments. Thus, a research gap is observed with respect to the way financial and management accounting are integrated and supported by systems, and their reflexes in the companies’ controllership.

Joseph *et al.* (1996) highlight that the trend towards integration goes beyond the financial statements published and the internal financial and management reports and extends to the database of the information systems. The authors explain that the integrated information systems permit the adjustment of controls, processes, systems and decision making. Alles, Kogan and Vasarheyi (2008) investigated accounting studies, distinguishing between those focused and not focused on the accounting information system. Based on the analysis results, the authors highlighted the need for further empirical research on the theme, due to the advances in information technology, the need to speed up internal processes and the improvement of the accounting information quality.

Recent international studies, such as Angelkort, Sandt and Weißenberger (2008), Procházka and Ilinitchi (2009), Taipaleenmäki and Ikäheimo (2009) and Angelkort and Weißenberger (2011), analyzed the relation among the variables accounting convergence processes, integration of information systems, integration of financial and management accounting and changes in controllership. In the Brazilian context, Gilio (2011) highlights the incipient nature of studies that investigate the conceptual approximation between financial and management accounting. As regards the impacts of the convergence process in controllership, in Brazil, the studies by Almeida (2011) and Almeida and Beuren (2011) are emphasized.

As regards the organizational area of controllership, the study by Angelkort, Sandt and Weißenberger (2008) reveals that the integration between financial and management accounting in German companies influenced the effectiveness of controllership. According to Angelkort and Weißenberger (2011), as a result of the integration between both accounting branches, controllership can use financial and management information, as the system adapts information for management control purposes. Nevertheless, the controllers perform activities that go beyond the operational and strategic aspect of the business and extend to the internal and external reports, with key indicators of financial performance, besides the management indicators. In that sense, Angelkort and Weißenberger (2011) highlight that, in the daily activities, the managers prefer to use the internal financial language, provided by the controllers, so as to maintain the consistency with the financial accounting information used for external communication.

In line with Angelkort, Sandt and Weißenberger (2008), in function of the growing relevance of the International Financial Reporting Standards (IFRS) for companies in the European Union, the interrelation between the IFRS and controllership may become stronger according to the managers. This scenario may also influence countries like Brazil, in view of similarities in the characteristics and activities the companies' controllers perform. Hence, the relevance of the research theme in the international context was taken into account to investigate this trend in Brazil.

In view of these considerations, the following research problem was established: What is the integration level between the financial and management accounting systems as a result of the convergence process with the international accounting standards and of the effectiveness of controllership in Brazilian companies? Therefore, this study aims to verify the integration level of the financial and management accounting systems as a result of the convergence process with the international accounting standards and of the effectiveness of controllership in Brazilian companies.

The framework of the integration between the financial and management accounting systems in this study is characterized by the Brazilian companies' convergence process with the international accounting standards. The new accounting standards entailed changes for accounting in general, including the form of identification, measuring and financial and management disclosure and the accounting processes. This context is characterized by the transition and transformation of the accounting systems, which used to be characterized as distinct or separate (Giglio, 2011). Based on the results by Gilio (2011), in this research, it is expected that the inter-relation will not only appear in the conceptual sense, but also in the companies' practical development of processes and in the use of information for decision making.

Angelkort and Weißenberger (2011) did not consider the accounting convergence process as put forward in this study. Therefore, the cross-sectional nature of the research, represented by the accounting convergence framework, is a differential in this research. Based on the convergence process with the international accounting standards through the accounting pronouncements issued by the Accounting Pronouncement Committee (CPC), it is expected that, in Brazil, similar to other countries, the integration between the financial and management accounting systems truly happened. In addition, it is expected that this integration also influenced the companies' controllership, due to its use of information from different areas, which include financial and management accounting, as both support the managers' decision process.

2. Theoretical Foundations

2.1 Changes in controllership as a result of the accounting convergence process

In Brazil, like in other countries (Angelkort, Sandt & Weißenberger, 2008), the functions of the controller and controllership in organizations have changed as a result of the modifications originating in the convergence process with the international accounting standards. The IFRS influence controllership in two ways: a) internally, the reports the data control systems produce are adapted to the determinations of the IFRS; b) instead of a separate accounting database, changes indicate that a database in compliance with the IFRS can be used by controllership, constituting an integrated account management system (Angelkort, Sandt & Weißenberger, 2008).

Angelkort, Sandt and Weißenberger (2008) indicate that the financial accounting systems based on the IFRS changes also influence controllership, for the following reasons: a) they promote the use of integrated accounting systems instead of the traditional dual-accounting model for decision and control purposes; b) the controllers' functions change towards becoming information providers to the financial accountants.

Hence, controllership gained new functions also focused on attending to external users, due to the new regulatory accounting requirements deriving from the IFRS. In addition, the IFRS have turned into an important component of the controller's daily activities, in function of the managers and other accounting users' information needs, besides the organizations' competitive and legal aspects. Angelkort

and Weißenberger (2011) observe that, if the management accounting information the controllers provide is consistent with the financial reports, the management will consider the quality of the service controllership provides more positively.

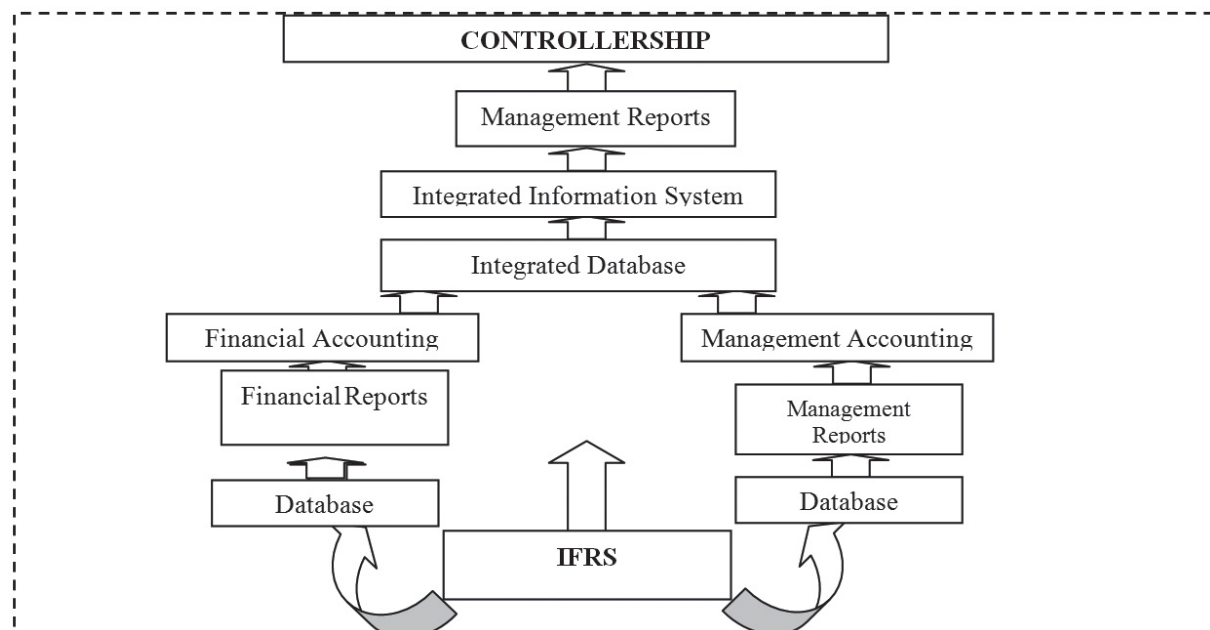
As a result of the adoption of the IFRS, the controllers' activities changes. Besides traditional activities like information provision, they gained the functions of decision support, control and internal consulting (Angelkort, Sandt & Weißenberger, 2008). Also, a third function was added as a consequence of the IFRS adoption, in which the controllers turned into information providers for financial accounting, thus becoming co-accountable for the companies' financial statements (Angelkort, Sandt & Weiberger, 2008; Angelkort & Weißenberger, 2011).

In the Brazilian context, in a study by Almeida (2011) about the impacts of the local standards' convergence with the IFRS in Brazilian companies' controllership, it was observed that the legitimation, compliance with controllership functions and implementation of the technical accounting pronouncements (CPCs) caused changes in the controllers' conduct, in function of the requirements corresponding to the companies' information disclosure level and the level of these information users' requirements.

To situate controllership inside organizations, the role of information systems in the development of their activities and processes needs to be established, in view of the different contingency factors involved. It should also be taken into account that the occurrence of internal and external changes have "enhanced their speed, flexibility and the direct integration between producers and between the former and their consumers, necessarily leading to the impacts caused in the management systems and more precisely in Controllorship and Accounting" (Menezes & Riccio, 2005, p. 47).

Controllorship is linked to the information system, especially regarding the execution of activities, which are related to planning and control, with a view to supporting the decision process. Lunkes and Schnorrenberger (2009) highlight that controllership should act in the coordination and support the integration of accounting systems. According to Menezes and Riccio (2005, p. 34), "the controllership activity associated with the formal presence of an accounting information system is fundamental to manage the economic aspect present in any corporate entity".

Thus, in Figure 1, the shape of controllership is displayed based on the accounting convergence process.



Source: Elaborated by the authors

Figure 1. Controllorship and approximation of financial and management accounting information systems

Figure 1 shows the new internal shape of the controllership department as a result of the implementation of the IFRS. As observed, changes occurred in this internal structure caused by external contingency factors, among which the IFRS stand out. They have influenced the database that is used by financial as well as management accounting. To transform these data into useful information, some elements proposed by the IFRS are considered, such as intangible assets, fixed assets, adjustment at present value, impairment test, which are considered in the appropriateness of the information. As a consequence of the new database, changes take place in both accounting systems' controls and internal reports.

Taipaleenmäki & Ikäheimo (2009) consider that the benefits of adopting the international accounting standards extend to the integration between financial and management accounting, through the accounting information systems. This also influences the approach among organizational entities like controllership, as the controller's main role in organizations is to transmit useful information to the managers, in accordance with the changes originating in the adoption of the international accounting standards.

In this context, it is highlighted that, independently of whether controllership is considered an operational or advisory entity, the controller's function was modified as a result of the IFRS adoption. In this study, however, it is considered that, due to the international accounting standardization process, the advisory function gained prominence, mainly in publicly traded companies, in view of the internal adequacy and information transmission to the companies' top hierarchical level.

2.2 Accounting convergence process and integration of financial and management accounting systems

Taipaleenmäki and Ikäheimo (2009) explain the transition of accounting to a discipline or a diverging sector inside companies as the age of diverging accounting, resulting from the separation between financial and management accounting, counter-arguing that only one accounting should exist. The so-called converging accounting is characterized by the solution of conflicts among different elements. It is considered that this fact derives from internal company areas' trend to act in an integrated manner, as their processes are interdependent.

The changes in the corporate environment and in the nature of business operations have increasingly driven companies towards a future perspective. That set new requisites for management accounting, leading to the use of accounting information, including non-financial measures (Taipaleenmäki & Ikäheimo, 2009). That expectation is similarly verified in the accounting convergence process, as this is considered as the main contingency agent causing these changes.

Before the accounting convergence process, authors already defended the link or even the integration between the financial and management accounting systems. Stolowy and Touron (1998) already discussed the relevance of integrated accounting in organizations, due to its double impact, in terms of information and changes in the business management process. Procházka and Ilinitchi (2009) argue that there has always been a link between the two accounting systems, even if at a low integration level.

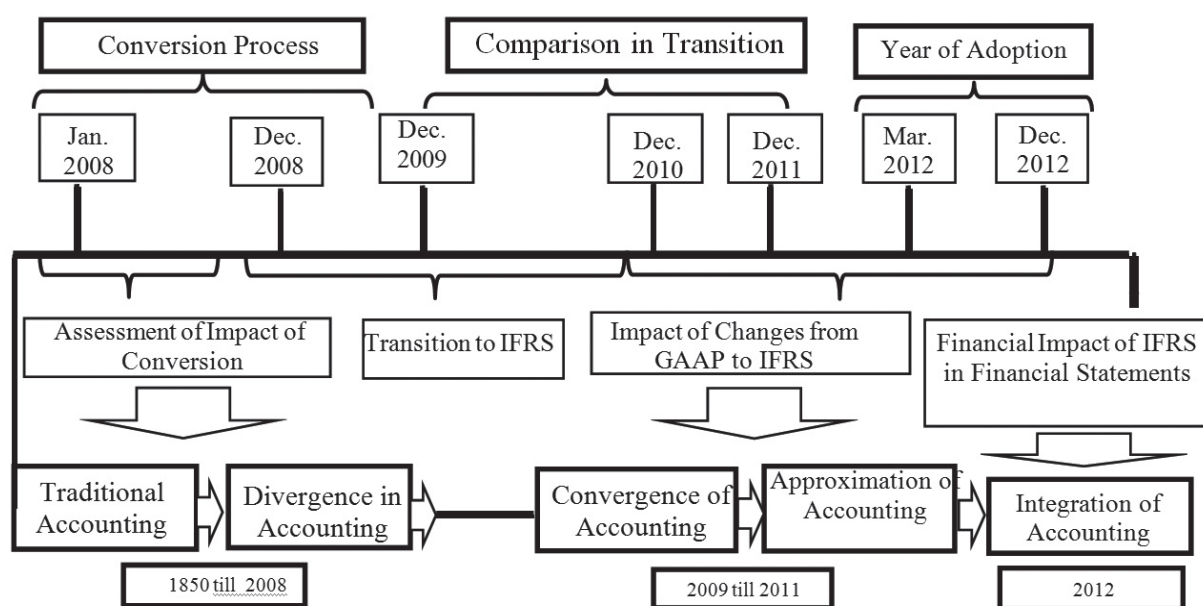
Hemmer and Labro (2008) affirm that the financial and management accounting systems are mutually dependent. Stolowy and Touron (1998) argue that the integration of the two accounting information systems means that accounting would become useful for decision making, that it would support the organizations' business management in the long term. Hemmer and Labro (2008) affirm that this is verified through the existence of connections among the endogenous variables, as well as in the reports, influencing the quality of the information produced by the information system, which the managers can use to found their decisions.

It is highlighted that different similar factors are considered favorable to promote changes in the financial and management accounting systems, highlighted by authors like Stolowy and Touron (1998), Hemmer and Labro (2008), Taipaleenmäki & Ikäheimo (2009), Angelkort & Weißenberger

(2011). To give an example, Stolowy and Touron (1998) present different arguments for the integration of the systems, such as the elimination of the information reconciliation work and the calculation of the cash flows in real time.

Different considerations have been formulated about the advantages of the financial and management accounting systems' integration for the companies and the accounting-financial reporting information users. According to Angelkort & Weißenberger (2011), the financial accounting records are used as the main database for the management accounting techniques, such as product costing, the elaboration and monitoring of the budget, the elaboration of reports and performance assessment.

In view of the relation and influence of the accounting convergence process on the financial and management accounting systems, Figure 2 displays the historical evolution in the transition from the Generally Accepted Accounting Principles (GAAP) to the IFRS, in parallel with the transition from separated to integrated accounting.



Source: Elaborated based on KPMG (2008) and Taipaleenmäki and Ikäheimo (2009)

Figure 2. Milestones in the transition to the IFRS and the integration between financial and management accounting

As observed in Figure 2, before 1850, traditional accounting existed, which acted for all purposes, using the double-entry method, without any signs of divergences (Taipaleenmäki & Ikäheimo, 2009). Edwards (1989), cited in Taipaleenmäki and Ikäheimo (2009), comments that financial accounting was restructured in the 1850's, in response to external investors' expectations. In that context, paradigmatic changes occurred in the accounting discipline/sector, in which the age of integrated accounting represents a new proposal (Taipaleenmäki & Ikäheimo, 2009).

In countries like France, the integration between financial and management accounting was already an established practice in large corporations since the 1980's, although this was not the case in small and medium-sized companies (Stolowy & Touron, 1998). According to Gilio (2011), this is partially due to the fact that both management and financial accounting use similar elements deriving from the latter's conceptual references, but that the economic essence has always been the premise of management accounting for decision making by internal users.

The integration between financial and management accounting may cause costs, resulting from the implementation and maintenance of the accounting information systems, even if these are integrated to a certain extent or not completely. It should be considered that the integration between the systems implies changes, not only in the software or system and information technology modules, but also in concepts,

regarding the conceptual and theoretical aspects of financial and management accounting (Taipaleenmäki & Ikäheimo, 2009). Changes in the calculation base, from the historical cost to the fair value, were one of the motives for the integration between both accounting systems after the international accounting convergence process (Taipaleenmäki & Ikäheimo, 2009).

In that context, the need for additional investments in information technology should be considered, among which the company's accounting information system stands out (Meter, 2006). In addition, the financial accounting records are used as the main database for the management accounting techniques, like product costing, the elaboration and monitoring of the budget, elaboration of reports and performance assessment (Angelkort & Weißenberger, 2011).

Although the accounting convergence process rests on economic foundations, originating in financial accounting, it is considered that this change process is not restricted to the financial aspects, related to the external users and financial statements, but also to the internal processes, reports and users. Procházka and Ilinitchi (2009) highlight that, although the IFRS are mainly directed at external users and the reports for internal users go beyond this scope, the function of accounting as a registering system is the provision of useful information to different users.

Taipaleenmäki and Ikäheimo (2009) argue that some elements can be part of financial as well as management accounting, including: international accounting standards, discretionary reports, performance measuring, transfer price, analysis of competitors, besides behavioral aspects, including accounting processes, role of auditors, incentive systems, company network control, corporate boards, among others. In that context, it is considered that the difference elements characteristic of financial accounting, or vice-versa, mutually converge under the influence of technological factors.

The accounting convergence process brought changes for the financial and management accounting information systems, including technical aspects and technologies as well as behaviors (Taipaleenmäki & Ikäheimo, 2009), with similar development trends. Horngren, Foster and Datar (2000) and Horngren, Sundem and Stratton (2004) affirm that the information systems for financial and management accounting underwent changes in function of external and internal factors and stopped being dual. These authors do not consider the type of accounting system used as a distinct element between the two accounting systems, which indicates the possibility of approximation or interaction between both.

McManus (2009) argues that the integration between the companies' systems and other projects and aspects will allow them to plan synergies between the conversion and constant adaptation to the standards in force and the other activities and daily work. In that context, the integrated system should attend to the internal as well as external accounting users, in view of the utility of accounting information for both groups. One important advantage of this integration is characterized by the unified perspective on the company's situation, which is essential for publicly-traded companies, in which clear links need to be established between the investors' objectives and the management accounting information (Angelkort & Weißenberger, 2011).

Perez, Ramalho, Misawa, Mattos and Souza (2008) highlight that the integrated information systems contribute to the improvement of the accounting information quality, considering that the accounting information derives from an integrated accounting information system and is associated with the quality of that information. As a result, the value of the information is associated with the difference between the benefits and costs of its use (Meter, 2006). Toigo and Nascimento (2008, p. 91) argue that the integrated accounting information system adds some benefits to the companies in a qualitative assessment: "[...] increase of the communication level, rapid answers to market changes and influence from the competition, flexibility in attending to clients, minimization of costs and periods to launch new products [...]".

The recent development of information technology, according to Taipaleenmäki and Ikäheimo (2009), is considered one of the promoters of the convergence and integration process between financial and management accounting. The information system considers that one entry is represented by financial data, in parallel with one exit that results in accounting information used for decision making. In that sense, the adoption of the IFRS caused changes in the process, as it tends to improve the quality of the accounting information, which originates in the information outputs produced by an integrated information system.

Meter (2006) argues that the integration of the accounting information systems can help to improve the quality of decisions in business. The IFRS are one of these support elements and motivate changes. Hence, they are considered useful not only for internal users, but also for internal communication and, consequently, for control purposes and for managers' decision making (Procházka & Ilinitchi, 2009).

Taipaleenmäki and Ikäheimo (2009) believe that the following elements of changes can be considered as a result of the integration between both accounting systems: a) technical and technology – international standards, discretionary reports, performance measuring, transfer prices, analysis of competitors; and b) behavior – accounting processes, role of auditors, incentive systems, company network control and risk. Some of these items are closer to financial accounting and others to management accounting, but are globally influenced by the accounting convergence process.

Thus, the investigation goes far beyond the results of integrated systems. The approximation needs to take place not only in certain aspects of isolated sectors, but conceptual and practical integration is needed between financial and management accounting. Hence, the principles of the IFRS are incorporated, to a certain extent, into the information systems, and the information based on the new standards become interesting for different users.

3. Methodological Procedures

This research is characterized as descriptive, as the objective was to verify the integration level between the financial and management accounting systems in companies. The research was undertaken through a survey, based on a questionnaire sent to one person in each of the selected companies, and a quantitative approach was adopted.

3.1 Research hypotheses

To define the research hypotheses, the premise is adopted that the management accounting information is provided and used in a more agile manner, through the use of an integrated accounting system (Angelkort & Weißenberger, 2011). Hence, both financial and management accounting are considered as part of an integrated system, from a financial perspective. In that perspective, in their daily activities, the controllers assume the co-responsibility for the financial information together with the accountant, besides the roles related to management and decision support. It is presupposed that the financial and management accounting information, when integrated, offer appropriate support for the controllers to provide more consistent information to the managers.

It is also assumed that, in their daily activities, the managers prefer to use the internal financial language provided by the controllers, so as to maintain consistency with the financial accounting information used for external reports, to investors for example. This implies that the controllers and accountant not only have a similar understanding of the business' operational and strategic performance, but that both the internal and external reports and the key financial performance indicators offer a consistent picture of the company's situation (Angelkort & Weißenberger, 2011).

Both information based on financial accounting and that based on management accounting are susceptible to verification. Thus, the budget, the internal reports, the financial performance indicators, among others, should be based on the accounting pronouncements issued by the Accounting Pronouncements Committee (CPCs). Angelkort and Weißenberger (2011) emphasize that the integration of accounting systems does not lead to a loss of relevance of the management accounting information, due to the fact that the IFRS are also appropriate for internal control purposes. As a result of the alignment between financial and management accounting, it is considered that the use of a same database can eliminate the existing overlapping between both.

As the management accounting data are subject to less conformity standards and verifications, any inconsistencies interpreted as errors or incorrect values will probably be attributed to the management system, that is, to the controllers' role, and not to the financial records. That would lead to an increasing negative judgment of the quality of the controllership service (Angelkort & Weißenberger, 2011). On the other hand, if the management accounting information the controllers provide are consistent with the financial reports, the management will consider the quality of the services provided by controllership more positively (Angelkort & Weißenberger, 2011). In that perspective, the following hypothesis was elaborated:

H₁: The integration level of the financial and management accounting systems is positively correlated with the Consistency of the Financial Language (CFL) as a result of the accounting convergence process.

Joseph *et al.* (1996) and Angelkort and Weißenberger (2011) defend the idea that the information systems for the publication of the financial statements and the internal accounting systems should be integrated. Hence, it is considered, similarly to the study by Angelkort and Weißenberger (2011), that the controllers' use of an integrated information system would lead to the transmission of more reliable information, with greater agility and, consequently, that it would lead to management satisfaction with the controllers' services. Based on these arguments, the following hypothesis is established:

H₂: The integration level of the financial and management accounting systems is positively correlated with the Quality of the Services Delivered by controllership (QSD) as a result of the accounting convergence process.

As regards the impact of the controllers in decision making, it should be highlighted that the impact in the management decisions affects the result, that is, the extent to which the controllership services are truly useful to the management (Angelkort & Weißenberger, 2011). According to Angelkort and Weißenberger (2011, p. 12), “nos níveis mais altos da hierarquia, estas decisões compreendem os elementos de tomada de decisão (abstraindo-se de problemas administrativos) e para os níveis mais baixos da hierarquia, os elementos influenciadores de decisão (configurando a estrutura de decisão)”. In that sense, the following hypothesis is presented:

H₃: The integration level of the financial and management accounting systems is positively correlated with the Management Decision Level (MDL) as a result of the accounting convergence process.

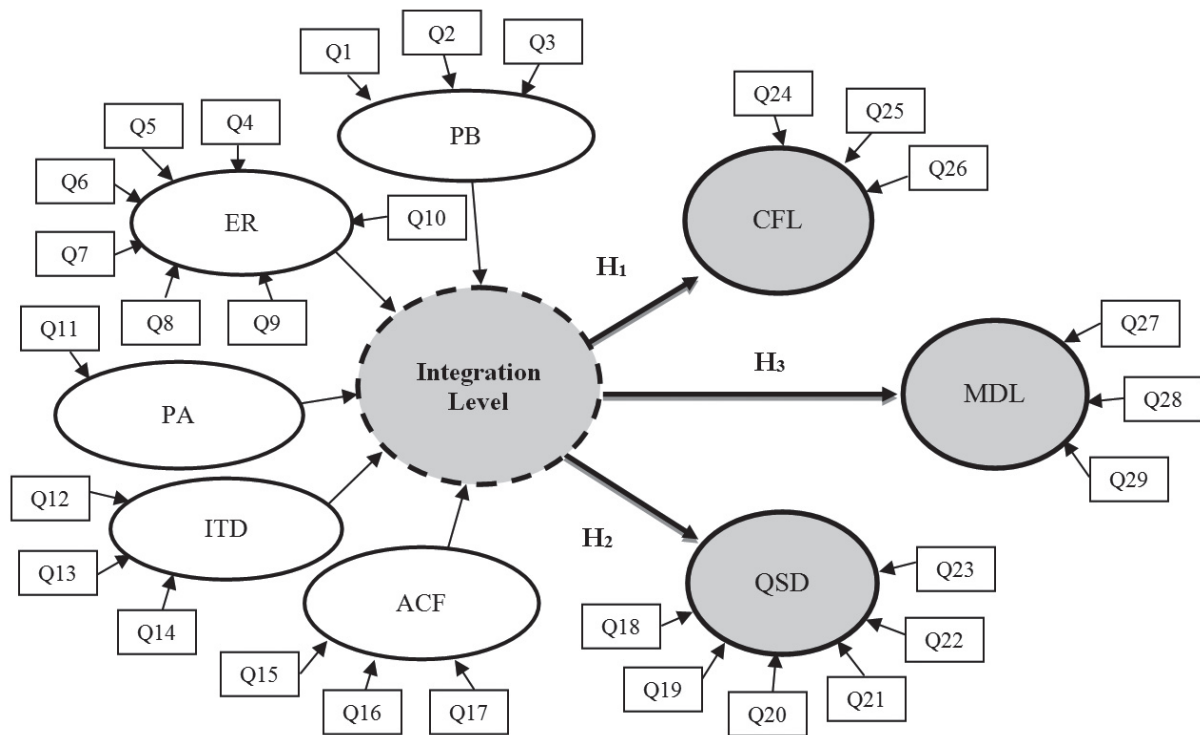
The efficacy of controllership depends on the combination between high-quality service delivery and the strong impact on the result, as this contributes to the achievement of the objective of the control function. Hence, the control function of the controllership department is to offer controls on the financial income with a view to putting in practice the company's management control system (Angelkort & Weißenberger, 2011)

3.2 Research variables

The latent variable, called accounting integration level, was verified through the mean score of the underlying items and aims to show the extent to which the financial and management accounting systems adopted by the controllers are being used in an integrated manner in the investigated Brazilian companies. The secondary variables, which constitute the latent variable, are: planning and budget, elaboration of reports, performance assessment, accounting information technology design, administration of the control function.

These variables were chosen by Angelkort and Weißenberger (2011) because they are indicated in the literature as elements related to the controller’s key tasks, besides being internal elements that permit the establishment of connections between financial and management accounting in each activity. In this study, the same activities were considered for the controllers.

The explanatory variables included: consistency of financial language, quality of controllership services and level of influence of controllership in management decisions. In Figure 3, the drawing is displayed with the number of questions in the research instrument and the respective explanatory variables, in the scope of the study by Angelkort and Weißenberger (2011).



Source: Elaborated by the authors

Legend: ILA: Integration Level of Financial and Management Accounting Systems; CFL: Consistency of the Financial Language; QSD: Quality of the Services Delivered by controllership; MDL: Management Decision Level; PO: Planning and Budget; ER: Elaboration of Reports; PA: Performance Assessment; ITD: Information technology designer; and ACF: Administration of Control Function.

Figure 3. Drawing of the relations among the variables, explanatory variables and questions from the research instrument

The explanatory variable “consistency of financial language” (CFL) reflects the extent to which the management perceives the information provided by financial and management accounting as coherent and consistent (Angelkort & Weißenberger, 2011). This derives from the fact that the accounting information is a corporate communication language. This variable consists of three questions, based on the study by Angelkort and Weißenberger (2011).

The explanatory variable “quality of controllership services” (QCS) assesses the service quality of controllership in terms of scope, compliance with deadlines or exactness, perceived by the administration. This variable consists of five questions, based on the study by Bauer (2002), and one question from the study by Angelkort and Weißenberger (2011).

The explanatory variable called “level of influence of controllership in management decisions” (MDL) represents the results of the controllers’ efforts, which reflects the influence of controllership in the organizational processes of decision making and control at the top levels of the hierarchy, from the perspective of the administration. This variable consists of three indicators, analyzed in the study by Spillecke (2006).

In Figure 4, the explanatory research variables and respective categories are displayed.

Explanatory variables	Categories
Consistency of Financial Language (CFL)	Understanding about the performance of the business
	Consistency of the information provided by the controller
	Consistent view of the business
Quality of Controllershship Services (QCS)	Range of management reports
	Range of information system
	Precision of information provided by the controller
	Timeliness of the information provided
	Methods and techniques provided by the controllers
	Explanatory power of management reports
Level of influence of controllershship in Management Decisions (MDL)	Role of controller in decision making
	Valuation of controller's activities
	Influence of controller in management decisions

Source: Elaborated based on Angelkort and Weißberger (2011)

Figure 4. Categories of the study's explanatory variables

As observed in Figure 1, although the variables are distinct to achieve common objectives, these have different foci. In addition, the intention is to observe similar behaviors with received to the quality perceived by the respondents, and also whether changes took place in the period before the convergence process (2004 till 2007) and during the accounting convergence process (2008 till 2011).

The variables “consistency of financial language” and “quality of controllershship services” rest on hypotheses H1 and H2, respectively. It is expected that a positive relation between the variable ILA and CFL, in the period before as well as during the convergence process with the international accounting standards, in the companies' controllershship; and the ILA and QSD, in the period before as well during the convergence process with the international accounting standards, in the companies' controllershship. The variable MDL corresponds to hypothesis H3 and a positive relation is expected between the ILA and MDL during the research period.

3.3 Population and sample

The initial population for the sample consisted of the 500 largest companies, considering the total sale, listed as the Best and Biggest in Revista Exame, issue 2011. In that group, the electronic address of 275 companies could be identified, to which the research instrument was forwarded. The research sample included the companies that were willing to answer the questionnaire, totaling 32 respondents. The decision was made to forward the questionnaire to a member of the selected companies, characterized as the controller. This choice is due to the fact that this professional has tasks and information from financial as well as management sources.

3.4 Data analysis

To analyze the research data, the test of paired means of the variables that constitute the dependent variable (ILA), and the remaining explanatory variables, corresponding to the period before and after the accounting convergence process. Next, the correlation between the explanatory variables Consistency of Financial Language (CFL), Quality of Controllershship Services (QCS) and Level of influence of controllershship in Management Decisions (MDL) was verified.

The existence of limitations inherent in the strategy adopted in this research should be highlighted. As regards the theoretical construction, the incipient nature of research on the variables accounting convergence process and integration of financial and management accounting information systems from a unified perspective is underlined, as well as the choice of the explanatory variables. From a methodological viewpoint, the size of the sample analyzed, the data collection period and the type of statistical technique employed are considered.

Concerning the statistical technique employed, the paired means technique permitted analyzing a same population with different perceptions in distinct periods, comparing the mean answers with regard to the accounting convergence process, considered as the main milestone. Thus, the result with the level of perceptions is obtained through the difference of means for these periods.

4. Results

4.1 Descriptive Statistics

In Table 1, the respondents' professional occupation is described through descriptive statistics.

Table 1

Professional occupation of respondents

Occupation	Absolute Frequency	Relative Frequency (%)
Controller	20	63%
Accountant	8	25%
Other Area	4	13%
Total	32	100%

Source: Research data

As verified in Table 1, among the 32 participants, 63% are controllers, followed by 25% accountants and 13% professionals from other areas. The controller is the professional with a general view of the organization and the changes in the companies. Thus, his perception is considered as impartial when attempting to verify the integration between the financial and management accounting systems, as he uses financial and management information in his daily work.

The accountant, in turn, presents a financial view of these changes, due to the fact that his activities are more linked to financial accounting. In that sense, it should be highlighted that both the controller and the accountant are agents involved in the implementation process of the international accounting standards in the companies, and need to develop their activities in compliance with legal requirements and contingency factors.

4.2 Paired Statistics

Table 2 shows the statistics with the test of means with paired samples for the explanatory and dependent variables, mutually related, and the descriptive statistics of the dependent variable integration level of financial and management accounting systems (ILA). In addition, the test of means is shown, which compares the answers before and during the accounting convergence process.

Table 2

Paired statistics of the sample (n = 32)

	Mean	Standard Deviation	Mean Error
PB_2007	2.7708	.80071	.14155
PB_2011	3.7708	.83575	.14774
ER_2007	3.0223	.37728	.06669
ER_2011	3.3884	.26722	.04724
PA_2007	2.7188	1.39664	.24689
PA_2011	3.6875	1.22967	.21738
ITD_2007	3.3854	.79924	.14129
ITD_2011	3.7708	.74985	.13256
ACF_2007	4.0729	.59709	.10555
ACF_2011	4.4271	.46555	.08230
ILA_2007	3.1940	.50554	.08937
ILA_2011	3.8089	.47759	.08443
CFL_2007	3.4583	.73689	.13027
CFL_2011	3.9896	.71584	.12654
MDL_2007	3.6823	.69992	.12373
MDL_2011	4.1510	.61980	.10957
QSD_2007	3.8333	.58045	.10261
QSD_2011	4.4375	.50402	.08910

*p < .05.

Legend: ILA: Integration Level of Financial and Management Accounting Systems; CFL: Consistency of the Financial Language; QSD: Quality of the Services Delivered by Controllershship; MDL: Management Decision Level; PB: Planning and Budget; ER: Elaboration of Reports; PA: Performance Assessment; ITD: Information Technology Designer; and ACF: Administration of Control Function.

Source: Research data

As observed in Table 2, all variables presented higher means in 2011 when compared to 2007, particularly QSD_2011 (4.4375), ACF_2011 (4.4271) and MDL_2011 (4.1510). These results indicate that the accounting convergence process is associated with the improvement of the controllership services, according to the respondents.

In addition, the ILA variable showed a higher mean coefficient in 2007 (3.1940) when compared to 2011 (3.8089). This difference indicates that, during the convergence process with the IFRS, the respondents' level of agreement with the integration level is higher.

According to these data, the mean response of the observations regarding the integration level of the financial and management accounting systems before the convergence process equals 3.19 levels of agreement, with a standard deviation of 0.50, which indicates that, in this period, there is no considerable dispersion in the levels of agreement in the answers to the survey. During the convergence process, the mean response equals 3.80 levels of agreement with a standard deviation of 0.47, indicating that, during this period, there is no considerable dispersion either in the levels of agreement among the answers.

The test of means with paired data shows that, statistically, there are differences at a significance level of 5% between the mean levels of agreement before and during the convergence process with regard to the level of integration between the financial and management accounting systems. This result a priori suggests that the integration level between the financial and management accounting systems was higher during the convergence process with the international accounting standards than in the previous period.

The variables “quality of controllership services”, “consistency of financial language” and “level of influence of controllership in management decisions” showed higher means in terms of levels of agreement for the period during the convergence process.

For the variable Consistency of Financial Language (CFL), the test of means with paired data shows that, statistically, there are differences at a significance level of 1% between the mean levels of agreement before and during the convergence process. This result a priori suggests that the level of integration between the financial and management accounting systems can be high, especially in function of the consistency of the financial language during the convergence process with the international accounting standards.

As regards the variable Quality of Controllership Services (QCS), the test of means evidences that, statistically, there are differences at a significance level of 1% between the mean levels of agreement before and during the convergence process. This result a priori suggests that the level of integration between the financial and management accounting systems can be high, especially in function of the quality of the controllership services during the accounting convergence process.

Concerning the variable Management Decision Level (MDL), the test of means with paired data shows that, statistically, there are differences at a significance level of 5% between the mean levels of agreement before and during the convergence process. This result a priori suggests that the level of integration between the financial and management accounting systems can be high, especially in function of the management decision level during the convergence process with the international accounting standards.

In Table 3, the correlations are displayed between the paired means of the dependent variable and other explanatory variables before and during the accounting convergence process.

Table 3
Paired correlations of the sample (n = 32)

	Correlation Coefficients
PB_2007 x PB_2011	.722*
ER_2007 x ER_2011	.551*
PA_2007 x PA_2011	.454*
ITD_2007 x ITD_2011	.750*
ACF_2007 x ACF_2011	.813*
ILA_2007 x ILA_2011	.577*
CFL_2007 x CFL_2011	.750*
MDL_2007 x MDL_2011	.806*
QSD_2007 x QSD_2011	.478*

*p < .05.

Legend: ILA: Integration Level of Financial and Management Accounting Systems; CFL: Consistency of the Financial Language; QSD: Quality of the Services Delivered by Controllorship; MDL: Management Decision Level; PO: Planning and Budget; ER: Elaboration of Reports; PA: Performance Assessment; ITD: Information Technology Designer; and ACF: Administration of Control Function.

Source: Research data

As verified in Table 3, the paired correlations of the variables are positive and statistically significant at a 5% significance level. It should be highlighted that, in the sub-variable ACF, the strongest correlation was found (0.813*), while the variable QSD showed the weakest correlation (0.478*). For the dependent variable, i.e. the integration level of the accounting systems, the correlation is moderate (0.577*).

This result suggests that there already existed a level of integration between the financial and management accounting systems before the accounting convergence process and that, during this period (2011), it became stronger according to the respondents’ perception.

In Table 4, the differences of means for the variables analyzed are shown for the period before and during the accounting convergence process.

Table 4

Paired test of the sample (n = 32)

	Paired Differences					t
	Mean	Standard Deviation	Mean Error	95% confidence interval		
				Inferior	Superior	
PB_2007 x PB_2011	-1.00000	.61054	.10793	-1.22012	-.77988	-9.265*
ER_2007 x ER_2011	-.36607	.32034	.05663	-.48157	-.25058	-6.464*
PA_2007 x PA_2011	-.96875	1.37921	.24381	-1.46601	-.47149	-3.973*
TDI_2007 x ITD_2011	-.38542	.54942	.09712	-.58350	-.18733	-3.968*
ACF_2007 x ACF_2011	-.35417	.34845	.06160	-.47980	-.22854	-5.750*
ILA_2007 x ILA_2011	-.61488	.45287	.08006	-.77816	-.45161	-7.681*
CFL_2007 x CFL_2011	-.53125	.51403	.09087	-.71658	-.34592	-5.846*
MDL_2007 x MDL_2011	-.46875	.41787	.07387	-.61941	-.31809	-6.346*
QSD_2007 x QSD_2011	-.60417	.55801	.09864	-.80535	-.40298	-6.125*

*p < .05.

Legend: ILA: Integration Level of Financial and Management Accounting Systems; CFL: Consistency of the Financial Language; QSD: Quality of the Services Delivered by Controllorship; MDL: Management Decision Level; PO: Planning and Budget; ER: Elaboration of Reports; PA: Performance Assessment; ITD: Information Technology Designer; and ACF: Administration of Control Function.

Source: Research data

To analyze the period before and after the accounting convergence process, the t test was used, which demonstrates that, in the research sample, there are significant differences of means between the variables in the periods before (2007) and during the accounting convergence process (2011). The variables PB (- 1.00000), PA (- .96875) and ILA (- .61488) showed the highest difference of paired means, according to Table 4. In that sense, it is inferred that the accounting convergence process may have favored the respondents' perception with regard to the increase in the integration level between the financial and management accounting systems in comparison with the period before this process.

The changes the convergence process with the international accounting standards entailed, which modified both conceptual and functional application aspects in the accounting systems indicated an increase in the integration level between the investigated companies' financial and management accounting systems. These results are in line with the studies by Angelkort, Sandt and Weißenberger (2008), Taipaleenmäki and Ikäheimo (2009), Angelkort and Weißenberger (2011), Gilio (2011) and Almeida (2011) concerning the increase in the integration level of the financial and management accounting systems.

The analysis results of the research variables show a favorable future situation for the integration between financial and management accounting in these organizations, due to the changes the convergence process with the IFRS entailed. This situation may become permanent at the end of the convergence process with the IFRS in the Brazilian context, as from the financial year 2012. This is due to the fact that this situation is considered irreversible and that it may entail positive consequences for the companies.

Table 5 shows the Spearman correlation coefficients for the variables. This test was applied based on the differences of means presented in Table 4.

Table 5

Spearman correlation of the variables

	NIC	CLF	NDG	QSC
ILA	1.000	.264	.713**	.657**
CFL	.264	1.000	.146	.054
MDL	.713**	.146	1.000	.771**
QSD	.657**	.054	.771**	1.000

**p < 1%.

Legend: ILA: Integration Level of Financial and Management Accounting Systems; CFL: Consistency of the Financial Language; QSD: Quality of the Services Delivered by Controllorship; MDL: Management Decision Level.

Source: Research data

As observed in Table 5, the correlations between the integration level of the financial and management accounting systems and the variables consistency of financial language, quality of controllorship services and level of influence of controllorship in management decisions, before the convergence period with the international accounting standards, in the controllorship of the investigated companies, are positive and moderate at a 1% significance level. Nevertheless, a stronger correlation is observed between the variable integration level of financial and management accounting systems and the level of management decisions.

In addition, it is observed that the correlations between the integration level of financial and management accounting systems and the variables consistency of financial language, quality of controllorship services and level of influence of controllorship in management decisions, during the convergence period with the international accounting standards, in the controllorship of the investigated companies, are also positive and moderate. Therefore, the research hypotheses H1, H2 and H3 are not rejected.

5. Conclusions

The objective in this study was to verify the integration level between the financial and management accounting systems as a result of the convergence process with the international accounting standards and the effectiveness of controllorship in Brazilian companies. In the analysis of the results, it was verified that, among 32 companies that participated in the research, the respondent was the controller in 63%. This professional can contribute to the investigation of the research questions, because of his general view of the organization, of the changes the company is subject to and because of his relative understanding of the financial and management accounting systems.

In the descriptive statistics regarding the integration level between the financial and management accounting systems, the test of comparison of means was applied to the period before and during the convergence process with the international accounting standards. The results revealed that the integration level of the systems was higher during the accounting convergence process. These results are in line with Taipaleenmäki and Ikäheimo (2009) and Angelkort and Weißenberger (2011).

The descriptive statistics for each of the explanatory variables and the test of comparison of means before and during the accounting convergence process suggests, a priori, that the integration level between the financial and management accounting systems increased in function of these three variables during the convergence process with the international accounting standards, although to different extents. The variables “quality of the services delivered by controllorship”, “consistency of financial language” and “management decision level” showed a higher mean coefficient in terms of the agreement levels during the convergence process.

In the correlation between the variables before and during the accounting convergence process, it was verified that the correlation between “integration level of financial and management accounting systems” and the other explanatory variables (consistency of financial language, quality of controllership services and level of management decisions) was positive and moderate.

In the inferential statistics, the final estimate was calculated for the relation between the respondents’ perception about each of the explanatory variables and the integration level of the financial and management accounting systems. Concerning the explanatory variables, it was verified that the consistency of the financial language, quality of controllership services and level of influence in the management decisions positively influence the integration level between the financial and management accounting systems before and during the accounting convergence process. Hence, the research hypotheses H1, H2 and H3 cannot be rejected.

In addition, it was verified that, driven by the consistency of the financial language, quality of controllership services and influence level of controllership in management decisions, the convergence process with the international accounting standards enhanced the integration level between the financial and management accounting systems in comparison with the period before this process.

This result is in line with the findings by Gilio (2011) concerning the approximation between financial and management accounting as a result of the accounting convergence process, although the author did not relate both accounting branches’ information systems. In that sense, it is inferred that accounting has gone through a change process at the same time as the accounting convergence process, in which it stopped being dual and moved on to a phase of greater integration between both accounting systems. This is similarly verified in the international context, according to the studies by Taipaleenmäki and Ikäheimo (2009) and Angelkort and Weißenberger (2011).

Based on the above, according to the respondents, the accounting convergence process positively influenced the consistency of the financial language, the quality attributed to the controllers’ services and the influence of their services on the investigated companies’ decisions. The results also suggest that the management accounting system the controllers use is integrated with these companies’ financial accounting system.

The controllers may have assumed new activities and functions as a result of the accounting convergence process, which go beyond the operational and strategic performance of the business. In that sense, it is argued that the controllers are able to provide more consistent and coherent information and that the management uses this information in corporate communication. Hence, probable, in their daily activities, the managers use the internal financial language the controllers provide to maintain the consistency with the financial accounting information used for external reporting.

This result also indicates that controllership plays an important role by supporting managers in the decision process in the investigated companies. Through his activities, the controller tends to influence the organizational decision and control processes at the top hierarchical levels. These results are in line with the findings of Angelkort and Weißenberger (2011). As a result of the IFRS adoption, this information may have become more integrated, through a database that produces more complete and more consistent reports. Hence, controllership, in the person of the controller, can use this information and transmit them to the managers.

In conclusion, the convergence process with the international accounting standards increased the integration level of the financial and management accounting systems in the investigated companies and the effectiveness of the controllership department, particularly regarding the consistency of the financial language, quality of controllership services and influence of the controllers’ services on these companies’ decisions.

In view of the study limitations, as the convergence process was still ongoing in the Brazilian context when the research was concluded, a similar research is recommended in the context of the accounting convergence process to check whether, after 2012, any changes occurred in the behavior of the research variables.

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