

**External Disclosure and Management Accounting Artefacts
Do Top-Ranked Companies In Quality Of Financial Reporting; Tend To Rank High In
Adoption Of Modern Management Accounting Artefacts?**

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Abstract.

Empirical studies have indicated low levels of adoption of modern management accounting artefacts, as suggested by the literature. Accounting theory encompasses the assumption that accounting should effectively assist both internal and external users. The present study aims at two main goals: to evaluate whether (a) large Brazilian companies actually use modern management accounting artifacts; and (b) companies that stand out by the quality of information disclosed to external users also stand out in terms of how they assist their internal users. A sample of 90 companies is examined, selected from the 500 largest companies in Brazil (2005 edition of "Melhores e Maiores") and from the nominees for the ANEFAC-FIPECAFI-SERASA Transparency Award (from 1996 to 2004). Data was collected from a survey submitted to the head of management accounting area, with items related to the level of use of both traditional and modern management accounting artifacts. Findings demonstrate that (a) the sample companies do use modern management accounting artifacts; and (b) the companies nominated to the award do not differ from the other companies, in terms of use of such artifacts.

Keywords: Management Accounting; International Accounting; Modern Artefacts; Quality of Financial Reporting; Brazil; BRIC.

1. Introduction

Since the publication of *Relevance Lost* (Johnson and Kaplan, 1987) there has been a significant increase in the number and variety of new models, systems, tools, and techniques in the general field of management accounting. These new management accounting artefacts have included activity-based costing (ABC), activity-based management (ABM), grid economics and business models (GECON), balanced scorecard (BSC), target costing, and theory of constraints, among others. However, despite the development of these new models and techniques, the actual practice of management accounting has apparently undergone little change, which suggests that research on theory of accounting has had little impact on practices adopted by organizations.

Remarkable studies that have attested the continuing gap between theory and practice include Scapens (1994), Otley (1985), Choudhury (1986), Johnson and Kaplan (1987), Edwards and Emmanuel (1990), Cohen and Paquette (1991), Brighth et al. (1992), Emore and Ness (1991), Green and Amenkhienan (1992), Ask and Ax (1992), Drury et al. (1993), Drury and Tayles (1995), Evans and Ashworth (1996), and Granlund (2001). These studies indicate that a worldwide gap does exist between theory and practice of management accounting. It is apparent that there is a relatively low level of implementation of new management artefacts—even those that have been most widely disseminated, such as ABC. However, in emerging economies such as Brazil, empirical research of this specific issue has been scarce.

Considering the importance of studying this gap within the Brazilian business environment, the first goal is to explore whether a particular set Brazilian companies actually uses modern management accounting artefacts. The population (companies) considered here consisted of (a) the 500 largest companies in terms of sales, as identified by a major Brazilian business publication (“Melhores e Maiores” in the *Exame* magazine of July 2005, referring to the 2004 fiscal year) and (b) the companies nominated for the ANEFAC-FIPECAFI-SERASA Transparency Award (between 1996 and 2004).

Many studies on accounting theory (e.g., Hendriksen and Van Breda, 1992) have emphasized that accounting should attend its different categories of users by providing specific information for decision-making. The consolidation of both financial and managerial accounting in dimensions of theory and practice highlights the mission of providing information for external and internal users. Considering this assumption, the second goal is to examine whether companies that stand out by the quality of financial reporting (information disclosed to external users) also stand out in terms of how they attend their internal users, through the adoption of modern management accounting artefacts. This objective was inspired by the study of Carr et al. (1997), which identified differences in strategies, management practices, and management reporting systems between companies with and without International Organization for Standardization (ISO) certification. The premise is that ISO certification indicates an emphasis on quality, which is likely to be reflected in the management reporting system of certified organizations. To examine this aspect in the present study, we investigated only the companies in the second group described above (nominees for the ANEFAC-FIPECAFI-SERASA Transparency Award).

In this study, management accounting artefact is conceptualized as managerial models, management systems, information systems, and also concepts for measurement and performance that may be adopted by professionals. Modern management accounting artefacts are those present in stages 3 and 4 according to IFAC’s proposal (1998).

The remainder of this paper is organized as follows. Following this introduction, the second section presents a literature review and conceptual framework for the study—including consideration of the

evolution of management accounting in accordance with the IFAC (1998) study and a review of relevant studies about the use of management accounting artefacts. The paper then presents the methodology of the empirical study. The results are then discussed, together with comparisons with previous studies. The paper concludes with a summary of the major findings, limitations of the study, and recommendations for future study.

2. Literature Review and Conceptual Framework

2.1 Evolution of Management Accounting

In March 1998, the International Federation of Accountants (IFAC) updated its study of the evolution of management accounting concepts, which had first been published in 1989. The IFAC (1998) study identified four stages in the evolution of management accounting. In the first stage, up to 1950, the main goal was cost and financial control using the company budget and cost accounting technology. In the second stage, from 1950 to 1965, management accounting concentrated on providing information for planning and management control through decision analysis and accounting-by-responsibility techniques. In the third stage, from 1965 to 1985, attention was focused on reducing resource losses by emphasizing process and cost management analysis. The fourth stage, from 1985 to present days, has focused on value creation through effective resource use by adopting value-creation drivers (for consumers and shareholders) and organizational innovation.

2.2 Previous Studies Related to the Management Accounting Artefacts

A large body of literature has examined the utilization of new management accounting artefacts. In view of the number and range of studies it is not possible to comment on any particular study specifically. However, a broad review of the relevant literature, in order to support this study, is essential.

Drury and Tayles (1995) conducted a survey of empirical studies of management accounting with a view to identifying issues that should be studied in greater depth. They classified these issues in five categories: (a) extensive use of full costs for decision-making, (b) accuracy of product costing system, (c) financial accounting mentality, (d) implementation of the controllability principle, and (e) changes in management accounting systems. Their conclusion was that, up to 1995, companies were using management accounting systems that were quite inadequate when compared with the prevailing theory.

Bjornenak (1997) studied cost accounting textbooks used in Norway from 1936 to 1996 aiming at ascertaining the sources that had influenced their contents. Results of this bibliographic collection were compared to findings from three empirical studies. The author concluded that cost accounting in Norway had gone through three phases: (a) strong influence from the German cost accounting model, (b) a mixture of influences, and (c) a predominantly North American influence. The study also showed the extent to which such changes in textbook contents, aligned with changes in the practice, play a critical role in institutionalizing such practices.

North American trends in management accounting were addressed in a study by Shields (1997), who reviewed 152 articles published by North American authors in international accounting journals in early-to-mid 1990s. The author found that the majority of articles dealt with management control systems. However, the publication frequency of topics considered by Shields (1997) to be modern, in these articles, was relatively low. Exceptions included four articles on ABC, four on just-in-time (JIT) and two on benchmarking.

Chenhall and Langfield-Smith (1998a) studied the role of management accounting in performance assessment systems in the context of organizational change. They identified three factors influencing the extent to which management accountants participate in the change process: (a) a shared perspective between accountants and managers about the role management accounting can play in the change process, (b) the extent to which operational managers provide support to the development of management accounting innovations, and (c) a strong sponsor for the changes required in management accounting (especially when the support of operational managers is weak).

Bjornenak and Olson (1999) developed a study based on literature review of management accounting aiming at analyzing characteristics of new proposed models from the literature. They focused on innovations such as models or set of techniques or ideas. The concept of model encompasses distinct characteristics, and based on how some of these characteristics are grouped or analyzed new systems may be structured. The authors proposed a generic structure where innovations in management accounting are classified according to scope and system dimensions. The scope dimensions are (a) descriptive objects (objects of interest for analysis), (b) variability factors and (c) time. System dimensions are (a) duration time (permanent or temporary), and (b) aspects related to providing information to users. The following models were analyzed: ABC, ABM, distributed information system, BSC, life cycle costing, target costing, and accounting for strategic management.

In a study of organizations from the United Kingdom, the United States, and New Zealand, Guilding et al. (2000) assessed the role of twelve management accounting practices in the relatively under-researched area of strategic management accounting. The practices considered in the study were: attribute costing, brand value budgeting, brand value monitoring, competitor cost assessment, competitive position monitoring, competitor assessment based on public accounting information, product life costing, quality cost, strategic costing, strategic pricing, target costing, and supply chain costing. In another study with British firms, Innes et al. (2000) employed a sample of large companies to examine the use of ABC.

The research of Innes, Mitchell and Sinclair (2000) compared results of two empirical studies on the use of activity based costing by large British companies, from 1994 to 1999. This research focused on changes linked to ABC adoption in a five-year period. Results foster the analysis of the nature of the adopted systems, their design, use, and user evaluation in terms of efficacy.

Maher (2000) reviewed the evolution of management accounting education in the United States. In this article, the author referred to Horngren et al. (2000), who had reported on the number of textbook pages devoted to new cost accounting topics. These new topics were: ABC/ABM, JIT, BSC, client profitability analysis, economic value added (EVA), *kaizen* (continuous improvement), life-cycle costing, non-financial measures, quality and time costs, strategic profitability analysis, supply chain, target costing, gains accounting, and value chain. The author stresses that the introduction of such innovations, as well as the expansion of management accounting in the academic curriculum shows that this field is alive and very well within the academia.

In other studies in this area, Haldma and Lääts (2002) examined the use of management accounting artefacts in a sample of manufacturing companies in Estonia, and Hughes and Gjerde (2003) conducted a similar study using a sample of companies in the United States.

The study of Baines and Langfield-Smith (2003), based on research with manufacturing companies and adopting structural equations modelling, aimed at examining relations between changes in the competitive environment and organizational variables such as history of changes in management accounting systems.

In this study, based on the work of Chenhall and Langfield-Smith (1998b), advanced management accounting artefacts were: (a) quality-improvement programs, (b) product profitability analysis, (c) benchmarking, (d) client profitability analysis, (e) shareholder value analysis, (f) target costing, (g) ABC, (h) ABM, (i) value chain analysis, and (j) product lifecycle analysis.

Sulaiman et al. (2004) undertook a literature review of traditional and contemporary management accounting practices in Singapore, Malaysia, China, and India. The authors classified the following management accounting practices as traditional: (a) standard cost, (b) sensitivity analysis of cost, volume, and profit, (c) return on investment, and (d) budget. The contemporary practices were: (a) total quality management (TQM), (b) ABC, (c) target costing, and (d) BSC. The study found that the use of these contemporary practices in these four countries had not yet been established as common practice.

In Brazil, Soutes and Zen (2005) studied the evolution of management accounting in a sample of companies by categorizing management accounting artefacts according to the stages suggested in the IFAC study (1998); however, the authors noted that the classification of an artefact in one of the evolutionary stages did not imply its non-use in another stage. Frezatti (2005) also conducted a large-scale study of Brazilian companies using cluster analysis to assess the degree to which management accounting practice conformed to theory. The study found that the companies had reached quite different stages in terms of their use of modern management accounting concepts.

Adelegan (2006) studied the use of some modern management accounting artefacts from 1999 to 2005 in a sample of companies from Nigeria. Szychta (2006) did a similar study with a sample of Polish companies.

In a theoretical study of cost management history, McNair (2007) reported that the first response to the demand for new forms of accounting information was ABC, followed by an explosion of new cost management tools in the late 1990s, as well as a rediscovery of pre-existing techniques. The author segments these systems into two perspectives, the operational and the strategic. The operational perspective contains process flow costing, activity-based management, theory of constraints, capacity cost management, activity-based budget, activity-based costing, *just-in-time* costing, and *backflush* costing. The strategic perspective presents the value creating model, strategic cost management, extended enterprise, lifecycle costing, and economic value added (EVA).

Abdel-Kader and Luther (2008) developed a study with British manufacturing companies, based on contingency theory, aiming at comprehending the impact of environmental variables on goals of management accounting systems. The authors conclude on the existence of a significant impact on the goals of management accounting systems from environmental variables, environmental uncertainty, customer power, organizational characteristics, competitive strategy, decentralization, size, operational complexity, technology, TQM and JIT, and product endurance. The established goals were based on the study from IFAC (1998), with these clusters: (a) cost determination and financial control; (b) planning and management control, (c) reduction of resource loss and (d) value creating based on effective use of resources.

Himme (2010) developed a survey study with German companies about cost management instruments. The studied systems were *benchmarking* (59%), *reengineering* (32%), *target costing* (30%), *value analysis of indirect costs* (23%), *value analysis* (12%), *zero-based budgeting* (6%), and *product lifecycle costing* (5%).

3. Research Design and Method

3.1 Classification of Management Accounting Artefacts

For the purposes of this empirical study, management accounting artefacts were classified as modern or traditional on the basis of this literature review. In particular, the categorization was based on: (a) the four stages of IFAC's (1998) study, (b) the classification suggested by Sulaiman et al. (2004), and (c) the distribution of artefacts proposed by Soutes and Zen (2005). Table 1 shows the artefacts categorized as modern, object of this research. (Table 1)

3.2 Objectives, Sample and Data Collection

As stated before, this research has two main objectives. The first one is to assess whether major Brazilian companies actually use modern management accounting artefacts and the second is to examine whether companies that stand out due to the quality of their information disclosed to external users also stand out in terms of how they serve their internal users, through the adoption of modern management accounting artefacts.

To accomplish the second objective the following research hypotheses guided the present study:

- H₁: Selected key monetary and non-monetary indicators of nominated companies are significantly greater than the same indicators of companies in the other group. A directional *t*-test for each indicator (employees, net profit, owner's equity, assets, liabilities, revenue, yearly change in net profit, yearly change in owner's equity, yearly change in assets, yearly change in revenues, profitability, profit-to-assets ratio, and profit-to-owner's equity ratio) was used to check this hypothesis, based on a .05 alpha level.
- H₂: Nominated companies present a significantly greater use of each management accounting artefact when compared to companies in the other group. A directional *t*-test for each item of the 24-item data collection instrument was used to check this hypothesis, based on a .05 alpha level.
- H₃: Nominated companies present a significantly greater overall use of traditional management accounting artefacts when compared to companies in the other group. A directional *t*-test for each item of the ten items related to traditional management accounting artefacts portion of the data collection instrument was used to check this hypothesis, based on a .05 alpha level.
- H₄: Nominated companies present a significantly greater overall use of modern management accounting artefacts when compared to companies in the other group. A directional *t*-test for each item of the fourteen items related to traditional management accounting artefacts portion of the data collection instrument was used to check this hypothesis, based on a .05 alpha level.

The questionnaire used in this study included 24 questions about the use of management accounting artefacts, 14 of which referred to the use of the modern artefacts. Respondents were asked to indicate their level of agreement with the use of each artefact in their company, with the following options: I "fully agree," "partially agree," "neither agree nor disagree," "partially disagree," and "fully disagree."

The questionnaire was sent to two groups of Brazilian companies in the period between November 2005 and February 2006. The groups were labelled as "nominated" and "others," as follows:

-*Nominated group*: 44 companies nominated for the ANEFAC-FIPECAFI-SERASA

Transparency Award, which received the questionnaire by postal mail; and

-Others: the 500 largest Brazilian companies (in terms of sales volume) according to the “Melhores & Maiores” ranking of the Exame magazine (as published in July 2005), which received the questionnaire by e-mail.

The original population thus consisted of 544 companies. However, only two companies from the first (“nominated”) group were not among the second group (“others”). The final prospective sample thus consisted of 502 companies. Of these, 90 companies responded (29 from the “nominated” group and 61 from the “others”). The distribution of the final sample according to economic sector is presented in (Table 2).

4. Results

4.1 Descriptive Analysis Related to the Use of Modern Management Accounting Artefacts

Considering the orientation of this paper and its goal, details about how each modern artefact is used by the groups of sampled organizations are discussed next.

4.1.1 Activity-Based Costing (ABC)

Almost half (46%) of respondents stated that they “totally disagree” with the use of ABC, whereas only 8% stated that they “totally agree” with its use. Table 3 shows the responses to this question. (Table 3)

Findings of the present study are in accordance with previous studies that have indicated a low level of use of this artefact. Evans and Ashworth (1996) found that only 21% of companies had taken steps to introduce ABC, and that only 28% of these had actually implemented the system. Innes et al. (2000) reported that the low rate of use of this artefact had remained relatively stable between 1994 (21% usage rate) and 1999 (17.5% usage rate). Haldma and Lääts (2002) found that only 7% of Estonian manufacturing companies used ABC. Szychta’s (2006) study of Polish companies found that only 10% of the sample companies used ABC. Chenhall and Langfield-Smith (1998c) found a “low” adoption level. Hughes and Gjerde (2003) found that only 8% of US companies used this artefact, and Soutes and Zen (2005) obtained the same result (8%) in their study with Brazilian companies. Adelegan (2006) reported that 22% of Nigerian manufacturing companies use it. Cagwin and Bouwman (2002) reported that 23% of companies, audited by the US Institute of Internal Auditors, used ABC. Frezatti (2005) found that compliance between theory and practice was approximately 15%.

4.1.2 Target Costing

The use of target costing was investigated through two questions: (a) “Does the company use the target costing concept?” and (b) “Do company managers believe that cost reduction is obtained in the project phase of a new product?” In response to these questions, 33% of the respondents stated that they used target costing, while 50% agreed that managers believed that cost reduction is obtained in the project phase of a new product. The responses are shown in (Tables 4 and 5).

Chenhall and Langfield-Smith (1998b) suggested that this is an emerging artefact; however, they reported that their research subjects considered the perceived benefits to be unrealistic, which explained a relatively low usage level. Guilding et al. (2000) stated that 45% of their respondents used this artefact in their strategic decisions. Other studies have reported lower usage levels. For example, Sulaiman et al. (2004) reported a usage level of 35%, Soutes and Zen (2005) indicated a usage level of 17%, and Szychta (2006) stated that only 3.3% used this instrument.

4.1.3 Benchmarking

Two questions were asked about the benchmarking process: (a) “Does the company follow the evolution of its non-financial indicators?” and (b) “Does the company compare some of its indicators with those of other companies in the same sector (benchmarking).” The results are presented in (Tables 6 and 7).

The results show that 83% of the companies used non-financial indicators, which suggests that they have internal benchmarks, and 85% of the sample used some form of external benchmark. The results of previous studies are consistent with these findings. Chenhall and Langfield-Smith (1998b) reported that many of their respondents adopted this practice, and Soutes and Zen (2005) reported that 66% of their respondents used the practice.

4.1.4 Kaizen

The popularity of the management philosophy of kaizen (continuous improvement) can be considered a derivative of the boom in total quality programs, which occurred in the 1980s and 1990s, in Brazil. A third (33%) of the respondents in the present study stated that this practice was used in their companies. The detailed results are presented in Table 8. This was considered an emerging practice by Coad (1999), who reported that 54.7% of respondents did not use it. (Table 8)

4.1.5 Just-in-Time (JIT)

As shown in Table 9, 31% of the surveyed companies used JIT practices. (Table 9)

Durden et al. (1999) reported a similar result in finding that 36% of the New Zealand companies had used this practice. However, Sulaiman et al. (2004) reported minimum usage of JIT among Asian companies. Hoque (2000) found that, on a five-point Likert-type scale, the mean score of positive answers among New Zealand companies was 2.99 (with a median of 3).

Theory of Constraints

One of the key points of the theory of constraints (Noreen et al., 1995) is the contribution margin per constraint factor. The use of this indicator was assessed by responses to the following statement: “The Company assesses the contribution margin per production-constraining factor.” As shown in Table 10, 52% of the companies utilized this concept. (Table 10)

4.1.6 Inventory Carrying Costs

The measurement of inventory carrying costs has been developed in the context of the GECON economic management model (Catelli, 2001) and various logistics cost measurement models (Lambert and Burduroglu, 2000). The use of this concept was assessed by responses to the statement: “The company calculates inventory carrying costs.” As shown in Table 11, 56% of the respondents stated that their companies did calculate the inventory carrying costs. It seems that no other studies have assessed the usage levels of this practice. (Table 11)

4.1.7 Economic Value Added (EVA)

The use of EVA was assessed by responses to the statement: “The Company uses EVA to assess its economic performance.” As shown in Table 12, 50% of the respondents stated that they agreed with the use of this practice. (Table 12)

The usage level found in the present study was significantly greater than that found by Soutes and Zen (2005), who reported that 25% of their sample companies used EVA to assess economic performance. Frezatti (2005) reported that compliance between theory and practice was approximately 29%.

4.1.8 Simulations

Responses to two statements were utilized to assess the use of simulations: (a) “Product profitability simulations are performed (revenues, costs, and margin),” and (b) “The company has specific software to simulate results.” As shown in Tables 13 and 14, responses unveiled that 88% of the sample companies performed profitability simulations, and that 58% had specific software for this purpose. (Table 13 & 14) Sulaiman et al. (2004) found that profitability simulation (analysis of cost, volume, and profit) had usage levels of more than 55% among Asian countries.

4.1.9 Balanced Scorecard (BSC)

The BSC is a modern accounting artefact that uses a combination of monetary and non-monetary indicators to assess the long-term strategies of a company in a variety of management dimensions (Malmi, 2001; Kaplan, 2006). As shown in Table 15, 46% of the respondents stated that their companies used the BSC. (Table 15)

Chenhall and Langfield-Smith (1998a, 1998b) described the BSC as an emerging artefact with moderate usage levels. Sulaiman et al. (2004) reported low usage levels (13%) of BSC among Malaysian companies, but higher levels (40%) among Indian companies. Soutes and Zen (2005) reported a usage level of 27% among their sample companies in Brazil. Frezatti (2005) reported that compliance between theory and practice was only 15%.

4.2 Comparison of the Use of Modern Artefacts by Company Groups

To assess the use of modern artefacts, the two positive responses (“totally agree” and “partially agree”) to questions about these artefacts were added together. Table 16 summarizes the two positive responses regarding “modern” artefacts of researched groups of companies. (Table 16)

Results show that companies in this studied sample adopt modern management accounting artefacts, although the intensity of use may vary among the analyzed artefacts. As shown in Table 16, the modern artefacts with the highest usage levels were simulations (88%) and benchmarking (85%). Intermediate levels of usage were observed with respect to inventory carrying costs (56%), theory of constraints (52%), EVA (50%), and BSC (46%). Low levels of usage were found with respect to target costing, kaizen, JIT, and ABC. In general, these results suggest that the sample companies were concerned with predicting possible results and comparing them with past results and competitors.

In addition, it is noteworthy that there was no evidence that the companies from the nominated group used modern management accounting artefacts more frequently than companies from the other group.

4.3 Comparison of Means for Hypotheses Testing

Beyond the results from the descriptive analysis, a set of hypotheses testing was developed targeting on the comparison of means presented by the two studied groups of companies. First, we analyzed financial indicators from both groups assuming that nominated companies would present higher averages (H_1). After performing directional t -tests with each indicator (employees, net profit, owner’s equity, assets, liabilities, revenue, yearly change in net profit, yearly change in owner’s equity, yearly change in assets, yearly change in revenues, profitability, profit-to-assets ratio, and profit-to-owner’s equity ratio), we found that five out of the thirteen selected indicators were higher in the nominated group: net profit ($t(82) = -2.779$, $p = 0.003$, one-tailed), owner’s equity ($t(82) = -3.194$, $p = 0.001$, one-tailed), assets ($t(82) = -3.538$, $p = 0.000$, one-tailed), and revenues ($t(82) = -2.890$, $p = 0.002$, one-tailed).

Another set of directional t -tests was developed to check whether nominated companies present a significantly greater use of each management accounting artefact, when compared to companies in the other group (H_2). We found only one item (from the traditional set of items) presenting significantly higher average in the nominated group: Q_{42} or “transfer pricing – question 2” ($t(88) = -2.138$, $p = 0.017$, one-tailed).

When exploring whether nominated companies present a significantly greater overall use of traditional management accounting artefacts, when compared to companies in the other group (H_3), we could not find any significant evidence ($t(88) = -0.279$, $p = 0.391$, one-tailed). Similar result was found when exploring whether nominated companies present a significantly greater overall use of modern management accounting artefacts, when compared to companies in the other group (H_4): no significant evidence ($t(88) = 0.581$, $p = 0.281$, one-tailed). Based on these results we reject null hypotheses H_1 and H_2 , and retain null hypotheses H_3 and H_4 .

5. Conclusions

Two major reasons justified this research. The first is related to the fact that findings from many empirical studies indicate that companies have a low level of use of modern management accounting artefacts, as proposed by the theory. The second reason is that, within accounting theory framework, the assumption of accounting effectively serving both external and internal users is noteworthy. Based on these two major reasons, we set the goals for this research.

The first goal was to verify whether top-ranked Brazilian companies from a specific sample, based on size in the Brazilian economy, adopted modern management accounting artefacts. The second goal is related to investigating whether selected Brazilian companies, based on the quality of financial reporting (external disclosure), also tend to have a high quality level when serving their internal users.

With regards to the first goal, based on the descriptive analysis of the results it is possible to claim that companies in this sample do adopt modern management accounting artefacts. It must be observed, though, that the intensity of such adoption varies among artefacts, but even artefacts with low level of use, such as just-in-time, *kaizen* and target costing, are adopted by more than 30% of the companies.

With respect to the second goal, findings unveiled that nominated companies (ANEFAC-FIPECFI-SERASA Transparency Award) do not differ from the other group of companies in this study. However, it must be observed that it is not feasible, based on these findings, to claim that studied companies are not serving their internal users in a good fashion. In addition, we claim that companies that stand out due to their quality of financial reporting (external disclosure) do not differ from the other group of companies in this study with regards to the adoption of modern management accounting artefacts. This conclusion is supported by the comparison of means between the two groups when testing hypothesis H_4 .

Certain limitations in the study are acknowledged. The non-probabilistic sample means that generalization of the study results beyond the studied sample is not recommended. If necessary, it should be undertaken with extreme caution. Moreover, the variation in the analyzed companies (in terms of size and importance) does not allow any conclusions to be drawn about these parameters. Care must therefore be taken in extrapolating from these findings or in making direct comparisons with the findings of previous studies regarding adoption of management accounting artefacts.

Limitations of this study suggest possible streams of research for future studies on this topic. These streams include (a) the development of broader studies with a probabilistic design, and (b) considerations of which artefacts are most commonly used in various economic sectors.

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Table 1

Management accounting artefacts

Artefacts
Activity-based costing
Target costing
Benchmarking
Kaizen
Just in Time (JIT)
Theory of constraints
Inventory carrying costs
Economic Value Added (EVA)
Simulations
Balanced Scorecard (BSC)

Table 2

Sample composition according to economic sector

Economic Sector	Number of Firms
Food, beverages and tobacco	12
Automotive and parts	4
Warehousing and foreign trade	8
Retailing	2
Construction	4
Electro-electronics	2
Pharmaceutical, hygiene and cosmetics	4
Cleaning	1
Construction material	4
Mechanics	1
Mining	3
Pulp and paper	3
Chemical and petrochemical	8

Economic Sector	Number of Firms
Transportation services	5
Various services	4
Public services	15
Iron and steel	6
Communication	2
Not identified	2
Total	90

Table 3
Adoption of the activity-based costing system (ABC)

	Frequency (%)		
	Nominated	Others	Total
Fully agree	0%	11%	8%
Agree	17%	25%	22%
Neither agree nor disagree	17%	10%	12%
Disagree	14%	11%	12%
Completely disagree	52%	43%	46%
Total	100%	100%	100%

Table 4
Adoption of target costing

	Frequency (%)		
	Nominated	Others	Total
Fully agree	3%	5%	4%
Agree	24%	31%	29%
Neither agree nor disagree	24%	30%	28%
Disagree	10%	7%	8%
Completely disagree	38%	28%	31%
Total	100%	100%	100%

Table 5
Reaction to the concept that cost reduction is obtained in the project phase of a new product

	Frequency (%)		
	Nominated	Others	Total
Fully agree	21%	21%	21%
Agree	24%	31%	29%
Neither agree nor disagree	17%	23%	21%
Disagree	28%	8%	14%
Completely disagree	10%	16%	14%
Total	100%	100%	100%

Table 6
Adoption of non-financial indicators

	Frequency (%)		
	Nominated	Others	Total
Fully agree	59%	41%	47%
Agree	24%	41%	36%
Neither agree nor disagree	14%	10%	11%
Disagree	0%	2%	1%
Completely disagree	3%	7%	6%
Total	100%	100%	100%

Table 7
Adoption of benchmarking

	Frequency (%)		
	Nominated	Others	Total
Fully agree	55%	57%	57%
Agree	34%	25%	28%
Neither agree nor disagree	7%	3%	4%
Disagree	3%	11%	9%
Completely disagree	0%	3%	2%
Total	100%	100%	100%

Table 8**Adoption of *kaizen***

	Frequency (%)		
	Nominate d	Others	Total
Fully agree	14%	16%	16%
Agree	21%	15%	17%
Neither agree nor disagree	14%	25%	21%
Disagree	10%	7%	8%
Completely disagree	41%	38%	39%
Total	100%	100%	100%

Table 9**Adoption of *just-in-time***

	Frequency (%)		
	Nominate d	Others	Total
Fully agree	3%	18%	13%
Agrees	17%	18%	18%
Neither agree nor disagree	14%	21%	19%
Disagree	10%	8%	9%
Completely disagree	55%	34%	41%
Total	100%	100%	100%

Table 10
Adoption of contribution margin per constraint factor

	Frequency (%)		
	Nominated	Others	Total
Fully agree	17%	18%	18%
Agree	31%	36%	34%
Neither agree nor disagree	21%	20%	20%
Disagree	7%	5%	6%
Completely disagree	24%	21%	22%
Total	100%	100%	100%

Table 11
Adoption of inventory carrying costs

	Frequency (%)		
	Nominated	Others	Total
Fully agree	21%	34%	30%
Agree	38%	20%	26%
Neither agree nor disagree	7%	11%	10%
Disagree	10%	2%	4%
Completely disagree	24%	33%	30%
Total	100%	100%	100%

Table 12
Adoption of Economic Value Added (EVA)

	Frequency (%)		
	Nominated	Others	Total
Fully agree	38%	36%	37%
Agree	21%	10%	13%
Neither agree nor disagree	14%	13%	13%
Disagree	7%	5%	6%
Completely disagree	21%	36%	31%
Total	100%	100%	100%

Table 13
Adoption of profitability simulations

	Frequency (%)		
	Nominated	Others	Total
Fully agree	69%	66%	67%
Agree	24%	20%	21%
Neither agree nor disagree	3%	10%	8%
Disagree	3%	3%	3%
Completely disagree	0%	2%	1%
Total	100%	100%	100%

Table 14
Adoption of specific software to simulate results

	Frequency (%)		
	Nominated	Others	Total
Fully agree	31%	41%	38%
Agree	21%	20%	20%
Neither agree nor disagree	14%	16%	16%
Disagree	10%	11%	11%
Completely disagree	24%	11%	16%
Total	100%	100%	100%

Table 15
Adoption of Balanced Scorecard

	Frequency (%)		
	Nominated	Others	Total
Fully agree	31%	25%	27%
Agree	14%	21%	19%
Neither agree nor disagree	10%	11%	11%
Disagree	7%	5%	6%
Completely disagree	38%	38%	38%
Total	100%	100%	100%

Table 16**Summary of positive responses on the use of modern artefacts**

	Frequency (%)		
	Nominated	Others	Total
Activity-Based Costing (ABC)	17%	26%	30%
Target costing	27%	36%	33%
Benchmarking	89%	82%	85%
Kaizen	35%	31%	33%
Just in Time	20%	36%	31%
Theory of Constraints	48%	54%	52%
Inventory Carrying Costs	59%	54%	56%
Economic Value Added (EVA)	59%	46%	50%
Simulations	93%	86%	88%
Balanced Scorecard	45%	46%	46%
			100
Total companies	100%	100%	%