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Management and Internal Control System: An Analysis of Accounting Offices Located in Belo Horizonte, MG, Brazil, and Its Metropolitan Area, Using the Four-Stage Model of Kaplan and Cooper

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Abstract The objective of this study is the analysis of the level of management and internal control of accounting firms using the four-stage typology developed by Kaplan and Cooper (1998) for designing management systems. Specifically, we sought to identify the level of integration between the areas on the aspects of data quality, reporting, and strategic and operational controls. The survey was conducted in 112 accounting firms located in the city of Belo Horizonte, MG, Brazil, and its Metropolitan Area, all registered in CRC-MG, the Regional Accounting Body. For collecting the data, it was used a questionnaire with multiple-choice objective questions, and other questions using the Likert scale. The respondents were the accountants who worked as administrators of their offices. In the data analysis, the bivariate technique was used for the issues related to the integrated system and the internal control. The multivariate technique, using the *Stepwise* method, was used to rank the offices for the four levels of management. The results allowed defining the structure and the profile of the sample and, from there, characterizing the accounting offices, as well as the level of integration of their information systems and the internal control implemented between the areas surveyed. It was found that 32.84% were at Stage I characterized by containing offices that show low reliability in financial reporting and accounting; 30.55% were at Stage II, which defines the offices that provide financial and accounting reports periodically, with a certain degree of reliability; 23.35% were at Stage III, which comprises offices that use computerized systems for producing financial and accounting reports, and use these data to the operational and managerial control; and 13.34% were at Stage IV, which indicates the use of integrated information systems for the preparation of all financial and accounting reports that are that generally are used both for decision-making and meeting the demands of customers.

Keywords Internal Control, Management System, Accounting Offices, Kaplan and Cooper's Four-Stage Model

1. Introduction

When providing outsourced accounting, the great challenge of the offices is offering services with reliability, quality and excellence personalized to each customer profile. In addition to the complexity of the services brought by the wide variety of customers the offices usually have, there is also the difficulty of maintaining updated internal controls for carrying out the routines of bookkeeping in its different areas.

In turn, the improvement of accounting standards and new technologies have led the offices to promote continuous improvements in management processes and routines they perform, in order to reduce costs, minimize errors and/or failures, and increase reliability in the services provided. Customers of accounting services, seeking for the best cost-benefit relationship, may make the option for the contracted internal accounting to be performed in their own facilities, using its integrated information system, or not: they also may prefer that the contracted services are performed on the premises of the customer, using the same database, and optionally exchanging files for the data integration.

In general, the managers of these contracting companies use the information provided by accounting as a support for decision-making, control and analysis of the current situation, and for short-term and long-term strategic planning (e.g. [45]). Besides the traditional financial reports, such as the balance sheet, the result statement, the statement of changes in shareholders' equity and the cash flow, there are several other managerial reports drawn up in accordance with the individual requirements and the complexity of each business.

So, despite the permanent efforts of the offices to keep

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updated, it should be noted that, due to the large volume of information necessary for the fulfillment of its main routines, it wouldn't be surprising the existence, in these organizations, of inadequate systems, with little consistency, for the purpose of generating several reports, internal control monitoring of their customers transactions, information recording, and also supporting their customers' decision-making process.

In order to enlarge the knowledge about such aspect, in this study we investigate the level of management of internal controls and integrated systems in those accounting offices and seek to highlight aspects that would help categorizing them into the four-stage model developed by [24]. According to this model, *Stage I* comprises the offices that have low reliability in financial reporting and accounting; *Stage II* includes the offices that provide financial and accounting reports periodically with a certain degree of reliability; at *Stage III* are the offices that use computerized systems for the generation of financial and accounting reports and use these data for the operational and managerial control; and, finally, at *Stage IV*, the ones which use integrated information systems for the preparation of all financial and accounting reports that are used for decision-making (e.g. [24]).

2. Theoretical Reference

2.1. Corporate Management, Control and Information System

There is a vast literature which deals with the management of companies and relates it to decision-making and to the issues of strategic planning and the decision-making process. Among the several studies on this theme, we point out [4]; [8]; [35]. Other authors relate it to information technology, as is the case of [14]; [7]; [15]; [37]. Others associate management to the different types of services provided by the companies: among these are included [33]; [37]; [38]; [20]; [3].

Organizational Management and Control are topics of high affinity, and some old works were important to their implantation at the academy. They are: [9]; [10]; [11]; [21]; 42], which defined the management control as an organic function of administration which goal is to guide a company beginning from the regulation of its activities; [12], which focused on the point of view of the budget analyst, when approaching the main perspectives of budget control; [13], which explained the control instruments and methods as tools for the performance evaluation, through the use of standards, relating management control to cost analysis; [36], which associated control to planning, drawing attention to the strong relationship between these two variables. The research by [18], which showed the management control as a primary responsibility of the senior managers in a sample of 31 industrial companies, deserves a particular emphasis: in this study, the authors realized that management control is a process that involves basically three elements: a) *objectives*: to determine what is desired; b) *procedures*: to plan how and when a task should be carried out, to scan the organization to determine who is responsible for what, and to establish patterns to determine what constitutes good performance, and c) *assessment*: to determine the level of the product obtained from each performed task.

The study of managerial controls has gained special attention and incentive in the research works developed in recent years. It is possible to find researches that dealt with the importance of variables involving the operational practices and the performance of companies, among which are included [6]. There are also works that associate the management controls with the quality and the reliability of the information and the integrated systems, such as [17; 25; 40]. Some other studies have tried to identify the importance of internal control as a support for the management of the companies, as is the case of [32]. Finally, the studies by [26], [30], [22], [43], [44] and [46] associated control to internal audit.

In what concerns the provision of accounting services, it is note worthy the contribution of some studies, such as [16], which examined the management control from the point of view of the accounting, taking control as an instrument that ensures compliance to business plans; [32], which provided evidence of the necessity of internal control for the operations performed by the offices through the implementation of activities in accordance with the specificities of each one; and finally, [5], which demonstrated how the internal control could ensure the integrity of the records and the financial statements, thus making the decision-making process more rational.

Among other things, it is recognized that the management controls also have a collective dimension in companies, because they involve the participation of the entire team, and the way information is used by different types of users. In the vision of [19], internal control is seen not only as a means to obtain and use the information to coordinate planning and to control decisions in a company, but also to guide the employees behavior. For [28], the main objective of the control in the companies is to safeguard the assets and define the direction of the company, ensuring its continuity and the fulfillment of its mission.

It is believed that implementing a good managerial control contributes to the growth and competitiveness of companies, ensuring that resources are obtained and applied effectively in achieving the specific objectives of the routines performed by the various areas ([2]; [27]; [19]). For [27], control systems go beyond simple managerial and operational procedures, and take on a strategic aspect. For the management of accounting offices, managerial control is best suited because it focuses the routines performed by administrative, accounting, fiscal and personnel areas. Thus, it is assumed that an implemented internal control ensures the offices managers a higher quality in the information provided and a greater safety in the services performed, and has as goal the reduction of errors and an increased reliability.

With regard to information management, accounting plays a key role by means of the issuance of its reports, since one of its objectives is to provide useful and reliable information to assist managers in the decision-making process, especially in what concerns management control ([28]). The information provided by the accounting contributes to the operational and strategic performance management of companies. However, this is criticized, mainly based on the argument that accounting information are generally processed by the various areas of an office and that, in order to maximize its usefulness, the information should be processed via integrated systems. [1] call attention, however, to the need of a proper planning, in addition to a previous survey on the various suppliers of such systems, to avoid the risk of the integration bring no contribution to the improvement of the organization's processes, if poorly implemented.

[31] Recommends that a system of accounting information should be fully aligned and integrated with the other company's information subsystems. But the system becomes a great ally in the decision-making process ([42]), once it gets to provide useful information in short time. According to [41], the information systems and the comptroller should be closely connected to the management of the companies. [29] asserts that the process of transformation of data that are used in the company's decision-making structure takes on a key role for the management of the information that can be analyzed on the basis of the records of past information, generated in the present, or enabling the possibility of projecting them in the future, as per the administration's interest.

[31] Also reasons that the use of a management information system to provide reports for decision-making brings also the possibility of joining and consolidating the information, and a greater dynamism to the flow of information, thus providing better management of all areas of the company. The generation and use of information by means of management information system for planning and support in the decision-making process promote strategies for short-term and long-term, which, according to [34], would make it easier for the companies to work with changing situations, thus becoming an excellent management tool.

In this aspect, it is understood that the accounting information generated by computerized systems, and allied to the management controls, are relevant factors for managers to use in their decision-making and especially in their companies managing processes.

This research does not aim to identify a conceptual model within the systemic approach, but the degree of integration of the various accounting offices herein under survey. To achieve it, we rely on the methodological approach of the four-stage model to identify levels of systems integration presented by [24].

2.2. Four-stage Model of Kaplan and Cooper

The four-stage model for designing cost and performance systems came to light in the decade of 1970, from studies by Kaplan and Cooper in companies that did not use informational resources able to contribute to the proper management of costs and improving operational efficiencies. According to [39] the first publication that addresses this model was an article by [23] entitled: "The Four-stage Model of Cost System Design". The model evaluates four characteristics that can be identified in accounting services: a) use of data processing systems; b) definition of services in accordance with customer expectations; c) continuous improvement in the performance of routines in search of quality, efficiency and speed; d) structuring of efficient and effective processes of services suited to the profile of the portfolio of customers ([24]). In this way, companies are classified according to the analysis of the management system on the aspects of data quality, financial reporting, expenses with customers and strategic and operational control.

Systems features	Stage I Systems Failed	Stage II Systems Financial Reports	Stage III Systems Specialized	Stage IV Systems Integrated
DATA QUALITY	Manual bookkeeping, with many mistakes and large variations in balances.	Use of computerized systems with no data integration.	Use of integrated systems between the accounting office's fiscal, accounting and personnel areas.	Use of integrated systems between all areas of the accounting office, including the financial and managerial administrative areas.
External Financial and Accounting Reports	Inappropriate. Do not reflect the office's reality.	Inappropriate. Do not have a frequency in their issuance.	Appropriate. Monthly or quarterly reports.	Appropriate. Reports issued frequently and used for the decision-making
Expenses with Clients	Inappropriate. There is no control.	In accurate. There are some controls of revenues, costs and expenses, however they are not used.	Appropriate. There are managerial controls of total revenues, expenses and costs	Appropriate to individual managerial controls for each client revenue, cost and expense.
Operational and Strategic Controls	Inappropriate. There is no control.	Limited and outdated managerial controls.	Managerial controls obtained from the system, but they are not frequently used.	Managerial controls issued frequently and used for the decision-making.

Figure 1. Four-stage model for designing a management system of accounting offices. Source: adapted from [24]

In this study, the same aspects were considered in the analysis of four stages to identify levels of management systems of accounting offices, focusing on the process of information management via computerized system. However, it is proposed an adaptation to the model to track the management of accounting offices from their specificities regarding their structure, the use of computerized systems in the provision of services and the integration between the accounting, fiscal, personnel, administrative, financial and managerial areas. Compared to the original model, this proposal keeps the concern regarding the aspects of systems such as data quality, management and financial reports, and operational and strategic control. However, while the model of [24] focuses on the costs, the adapted model focuses on internal control and the management of information (e.g. Figure 1).

3. Methodology

In order to check at what stage of integration the accounting offices were, from the point of view of [24] proposal, in terms of internal controls and management information systems, a survey was carried out in accounting firms located in the city of Belo Horizonte and its Metropolitan Area, and registered in the Regional Accounting Body. As a methodology, it was adopted the descriptive study, by means of the *survey-type* quantitative field research. At the time of the survey, the total population comprised of 1,172 accounting offices registered in CRC-MG in Greater Belo Horizonte. Out of them, it was extracted a random sample of 112 offices. The technique of sampling was probabilistic and the margin of error corresponding to one standard deviation was 4.74%, and to two standard deviations (95.5 probability) was 9.44%.

The data were collected using questionnaires answered by the accountants who worked as administrators of the accounting offices. It is assumed that these respondents knew in depth all the dimensions researched as well as the variables that would be present in the management processes. The questionnaire contained 52 questions divided into three blocks, which used multiple-choice questions and Likert type scale. In the first block, the aim was to categorize the accounting offices' profiles and structure. The questions of the second block aimed to analyze the characteristics of operational internal control, of the integrated system, and the process of management of information for the decision-making by the accounting offices' accountants. Finally, the third block intended to identify at which of the four management levels the accounting offices of Belo Horizonte and its Metropolitan Area were, using the four-stage model of [24].

The data analysis was carried out in three stages, each with specific procedures. In the first step, it is presented a descriptive statistics of initial exploratory analysis of the database. In this step, cross tables were constructed by attaching the joint relationship of integrated system and internal control with the other qualitative variables from the questionnaire. The second step – multivariate analysis –tried to ascertain the joint relationship of variables that are important to explain the variable-answers "internal control" and "integrated system", using as association measures two options of chi-squared (χ^2) for the verification of the results to be exposed: Pearson and the likelihood ratio test.

After that, it was statistically chosen the most relevant explanatory variables, by means of the *Stepwise* method. It was possible to jointly analyze all statistically significant explanatory variables and, in addition, to identify, for each qualitative explanatory variable, the categories that are most important to explain the behavior of the accounting offices' levels of integration and internal control. To assess the quality of the ordinal regression adjustment that enabled to identify the explanatory variables, it was used the coefficient of determination or McFaddens pseudo R^2 that corresponds to the dependent variable's proportion of variation explained by the explanatory variables. The higher its value, the more the variability of the dependent variable (i.e., integrated system or internal control), is explained by the variability of the explanatory variables. To choose the final ordinal regression model it was used the Akaike Information Criterion (AIC).

Knowing the statistically significant explanatory variables, either with positive or negative effects on the level of integration and internal control of the accounting offices analyzed, it was identified at which phases they were situated, according to the third block of questions of the questionnaire. The objective was to check if such variables would determine (or not) at which of the stages categorized by the model of [24] the offices were.

4. Analysis and Discussion of the Results

4.1. Structure and Profile of the Accounting Offices

The data obtained allow a quantitative analysis of the surveyed accounting offices' structure and profile. Thus, 27.7% of the offices did not have an implemented internal control, 57.1%hadit partially implemented and only 15.2 had internal control completely implemented, as indicated by the survey respondents. In what concerns integrated systems, 38.4% of the offices were said not to have integrated management systems, 45.5% were partially integrated, and 16.1% had their systems completely integrated.

In Table 1, we present a joint analysis of categorical variables, in which "proportion of integrated areas" is crossed with "existence of internal control" and "support for decision-making". Out of the total sample, 37.32% claim not to hold any of these categories. On the other hand, 27.23% of the offices claim to possess all three categories.

In Table 2, it is presented the data on internal control and integrated systems and their associations and correlations between categorical variables of structural profile that characterize the offices. According to the results, it was

observed that the average time (18 years) is greater in the offices that have partially integrated system and do not have internal control, and lesser (11.5 years) in those that do not have internal control and integrated system. For the offices that have a complete integrated system and a partial internal control, the lifetime is approximately 13 years.

Table 1. Proportion of integrated areas with internal control and support used to make decision

	Not available	Partial	Complete
Integrated Areas	0,3839	0,4554	0,1607
Implemented internal control	0,2768	0,5714	0,1518
Support for decision-making	0,3839	0,3147	0,3013
Joint variables	0,3732	0,3545	0,2723

Source: Survey data.

The respondents pointed that the average number of partners is larger in offices that have partially integrated system and do not have internal control (2.6), and lower in those that do not have integrated system and have a fully implemented internal control (2.12). The average number of employees (14.1) is larger in offices that have partially integrated system and fully implemented internal control, and lower (6.4) in offices that have completely integrated system and do not have internal control. It is evidenced a reduced number of employees in relation to the offices that have partially integrated system; it is also possible to realize that the level of implemented internal control presents an association with the number of employees of these offices.

As per the qualification levels associated to the category "partners" and "employees" and associated with the existence, or not, of integrated system and internal control, the results show that among those who do not have integrated system and internal control, the average percentage is higher among the employees who have technical qualification in Accounting (high-school level, 70%) and between the partners with the same qualification (59.3%) (SeeTable2). It is noticed also that among the accounting firms that have a completely integrated system and the no internal control implemented, within the group of partners, the highest average percentage (56.6%) is comprised by accounting college? students. In the group of employees, the least percentage comprises people at the technical level (non-college level, 76%), and the smallest is the staff that includes college-graduated and post-graduated in Accounting. In offices that have partial internal control and fully integrated system, among the employees the largest average percentage occurs for the technical level (42.7%) and the lowest in the postgraduate staff (8.8%). In the partners' group, the highest average is for partners graduated in college accounting (38.8%).

With respect to the activity of the clients, it is observed that the average percentage is greater in the Service Sector than in other activities, and less in the Third Sector (NGOs, etc.). In the Service Sector, stand out the offices that do not have integrated system and have partial internal control because, among them, the largest average percentage (47.8%) occurs in this Sector and less in the Third Sector (2.1%).In the offices that have partially integrated system and completely implemented internal control, most customers is in the business of providing services (46.4%), followed by commercial companies (37.2%). In the offices that do not have integrated system neither internal control, the highest average percentage of customers (38.1%) also belong to the Service Sector,(36.8%) to the Commerce Sector, and the smallest to the Third Sector (4.3%). In this case, it is possible to conclude that neither the implementation of internal control nor the use of integrated systems is associated with the economic activity of customers. That is, no one can assume that the offices are structured according to the complexity of the provision of services.

With respect to the customers' federal fiscal scale, it is observed that the ones which chose the "Simples Nacional" regime are those with the highest average as compared to the others. In turn, among the offices that have partially integrated system and partial internal control, the largest average percentage occurs in those who have clients whose tax regime is the Simples Nacional (50.3%) and the lowest for customers classified as "acquitted" or "exempt" (3.1%). The latter group has the lowest average among all other types and is lower in offices that do not have integrated system and have an implement internal control (1.3%).

In managerial terms, there is no evidence that activities involving service to the customer, in different demands, cause the need for enhancement and integration of systems for generating information and control of the offices routines. On the other hand, it was observed some accounting artifacts which influence on the information management and are used as auxiliary tools in decision-making by accounting offices. Among others, initially are considered the financial statements prepared by the accountants in accordance with current legislation, either through managerial accounting or simply as a source of information for the external public (e.g. Table 3). In this regard, the concern was to identify the frequency of issuance and preparation of statements and not how they are used in supporting the decision-making.

All the accounting offices surveyed declared to be using the "trial balance", and its periodicity was said to be daily in 7.14%, monthly (22.32%), quarterly (35.7%), and annual (34.8%). It is observed, however, that the issue of the accounting statements "balance sheet" (58.0%) and "results statement" (54.5%) follows the accounting routine for tax purposes only and not for managerial purposes in most of those offices. In general, the results show that the information is not being used for the short-term operational control.

4.2. Ordinal Regression Results

After the descriptive analysis, multivariate associations were found in order to analyze if the characteristics of the accounting offices explain, in a combined way, the level of

integration or internal control implemented. For completion of such objective, it was estimated the ordinal regression, since the dependent variables are qualitatively ordinal in nature. The *Stepwise* method was used to choose which out of the main variables that should be contained in the template. Once identified the variables that produced the best adjustments, they were united in a single final model. It is known that, due to the presence of multicollinearity, the standard errors of coefficients are altered, and, in extreme cases, it is impossible even to estimate the coefficients due to the singularity of the matrix of explanatory variables. Thus, it was observed the strong presence of multicollinearity among the explanatory variables of the model by means of the *Variance Inflation Factor* (VIF).

After using the Stepwise method and evaluating the VIFs, we chose to withdraw from the set the variables "preparation of management reports and budget" when the explained variable was the offices' integrated system. Also were withdrawn the variables "integrated reports" and "office lifetime" for not being statistically significant even at 10%.

In the case of categorical variables, if one category is considered significant, all the others should be kept in the model for comparison. Table 4 contains the estimated results to explain the variable "integrated system".

The results obtained showed that the integration levels are lower in offices that have employees with technician level qualification in accounting, who use intuition to make decisions relating to the attitude of competitors, when compared to offices in which they do not use it. Levels of integration are also smaller in offices that make little use of clients' ideas as a support to managerial decision, when compared to those that do not use them.

Among the descriptive variables that were found statistically significant and which exerted negative effect on the levels of integration of offices, the one that has the greatest influence, due to the numeric value of its coefficient, is the variable "decision-making based on intuition".

Table 2. Average quantities and percentages of the variables conditioned to the existence (or not) of internal control and implemented integrated system

Integrated system	Ñ p.	Partial	Complete	Ñ p.	Partial	Complete	Ñ p.	Partial
Internal control	Ñ p.	Ñ p.	Ñ p.	Partial	Partial	Partial	Complete	Complete
Lifetime	11.5	**18**	13.2	12.6	12.8	13.6	12.2	16.1
Number of partners	2.5	**2.6**	2.2	2.57	2.4	2.5	**2.1**	2.4
Accounting technicians	**59.3**	46	26.6	32.42	26	44.2	31.2	18.8
Accounting students	12.5	27	**56.6**	16.7	20.7	11.5	43.7	26.6
Graduated in Accounting	18.7	27	6.8	35	36	34,6	18,7	**38,8**
Post-graduated	9.38	0	10	15.7	**17.1**	9.6	6.25	**15.5**
Number of employees	9.3	12.8	**6.4**	7.4	10.4	10.3	10	**14.1**
Accounting technicians	70	63	**76**	71.3	54.4	51.1	67.5	42.7
Accounting students	26.2	34	24	17.8	33.2	32.3	23.7	**33.8**
Graduated in Accounting	3.7	3	**0**	8.6	10	14.2	7.5	**14.4**
Post-graduated	0	0	0	2.1	2.2	2.3	1.2	**8.8**
Customers in the Service Sector	38.1	36.5	44	**47.8**	44.8	33.8	41.2	46.4
Customers in the Commerce Sector	36.8	**46**	38	38.6	37.8	41.1	42.5	37.2
Customers in the Industry Sector	20.6	16	15	11.3	13.9	**21.9**	15	13.1
Customers in the Third Sector	**4.3**	1.5	3	2.1	3.4	3	1.2	3.2
Fiscal Regime: "Simples"	40.6	43.5	47	45.2	**50.3**	35.3	46.8	48.7
Fiscal Regime: Deemed profit	36.2	**39**	34	37.6	31.4	38.8	36.2	34
Fiscal Regime: Taxable profit	19.3	16	16	15.2	15.1	**22.6**	15.6	15.4
Fiscal Regime: Acquitted/exempt	**3.75**	1.5	3	1.8	3.1	3.1	1.3	1.7

Ñ p.= does not have.
Source: Survey data.

Table 3. Average frequency of issuance of accounting and financial statements

Statement	Does not make use	Daily	Monthly	Quarterly	Annual
Balance sheet	0.000	0.071	0.223	0.357	0.348
Assets balance sheet	0.009	0.000	0.125	0.286	0.580
Results statement	0.009	0.000	0.170	0.277	0.545
DFC (Statement of Cash Flows)	0.429	0.152	0.107	0.063	0.250
DMPL(Statement of changes in shareholders ' equity)	**0.955**	0.000	0.000	0.009	0.036
Budget	**0.964**	0.009	0.009	0.000	0.018

Source: Survey data.

Table 4. Estimated results for the explained variable "integrated system"

	Coefficient	Standard error	P-value
Number of accounting technicians in the staff	-0.016	0.009	0.062
Does not have manual bookkeeping in administrative and financial areas	4.644	1.189	0.000
Does not have manual bookkeeping in managerial area	2.777	1.244	0.026
Rarely usesintuition in decision-making	-1.165	0.647	0.072
Often uses intuition in decision-making	-2.230	0.669	0.001
Rarely uses market research in decision-making	1.685	0.812	0.038
Often uses market research in decision-making	0.073	1.512	0.961
Rarely uses customers' opinion in decision-making	-1.587	0.583	0.007
Often uses customers' opinion in decision-making	0.057	0.627	0.928
Rarely uses the office database in decision-making	2.311	1.364	0.090
Often uses the office database for decision-making	0.663	1.315	0.614
Rarely uses the managerial information system in decision-making	-0.405	0.598	0.498
Often uses the managerial information system in decision-making	1.539	0.602	0.010
Rarely uses Excel spreadsheets in decision-making	0.861	0.507	0.090
Often uses Excel spreadsheets in decision-making	1.895	0.704	0.007
Prepares daily cash flow	1.244	0.703	0.076
Prepares monthly cash flow	-1.167	0.792	0.141
Prepares quarterly cash flow	0.791	1.045	0.449
Preparesannualcash flow	0.533	0.565	0.345
Intercept 1	5.900	2.224	0.008
Intercept 2	9.750	0.144	0.000
Pseudo R^2 of McFadden: 34.69			
AIC: 191.1541			

Source: Survey data.

"Not using manual bookkeeping in the administrative and financial areas" and neither "in managerial area" are included among the variables that exert positive effects on the level of integration of the companies, among the statistically significant at 10%. Thus, it is concluded that the manual controls tend to decrease in administrative and managerial areas when the level of integration tends to be greater. In these terms, it could be argued that the degree of integration of such areas is essential to the processes of integration of the offices. Mainly the administrative area, because it provides a perception that the controls are more efficient.

For all other statistically significant variables at 10%, the results indicate that the offices that use little market research, in relation to the ones that never use it, tend to increase their level of integration. Similarly, offices that use database tend to increase the level of integration in comparison to those that do not use; and the ones that also use a lot the information systems also tend to increase the level of integration vis-à-vis the ones that do not use them. Interestingly, the offices that use *Excel* spread sheets rarely or very often to support decisions in managing the accounting organization have higher level of integration. This may indicate flaws still existing in the process of integration, or parallel controls, which are used until the systems reach an increased reliability in the generation of reports. Finally, offices that use daily cash flow, compared to those that do not use it, tend to have higher levels of integration, which suggests a higher level of information that is used for the decision-making based on reports generated by the information system integrated between the areas, specifically the financial and administrative ones.

The same procedure adopted when the response variable was the "integrated system" was also adopted for the variable "internal control". Thereby, it was observed the strong presence of multicollinearity among the explanatory variables of the model, using the Variance Inflation Factor (VIF). After using the *Stepwise* method and evaluating the VIFs, we decided to remove the variable "employees graduated in accounting". It was also withdrawn the variables "use no computerized management report", "number of partners and employees studying accounting", "number of partners graduated in accounting", because they were not statistically significant even at 10%.

As to the results obtained, as shown in (e.g. Table 5), initially it was observed that the variables that negatively relate to internal control are "number of accounting technicians" in the staff– which has little influence – and "number of customers". In this case, the reduction in coefficients of those two items would indicate a tendency to increase the internal control in the office. Specifically, in relation to the number of clients, it might be assumed that both the structure and the need for control of operational routines of the offices would be correlated to this variable.

Among the statistically significant variables, "preparation of management reports using computerized systems" tends to reduce the need for using the implemented internal control. As to decision-making, there is evidence that the higher the benchmarking of the actions taken before the competitors, the more favorable the office will be to increase its internal control. The variable of greatest impact is "preparation of the budget", indicating that the offices that make use of this accounting tool daily, when compared to those that do not use it, tend to reduce, on average, the internal control deployed for administrative, financial, managerial, fiscal, personnel, and accounting areas.

The variables that tend, on average, to increase the level of internal control in accounting offices are "manual bookkeeping" in managerial, administrative and financial areas, and the "frequency of issuance of managerial and financial reports". Among them, it is possible to notice that the variable of greatest influence on the increase of the level of internal control is "preparation of the results statement". It is worth noting that the positive values for the coefficients estimated increase in proportion to the increase of the frequency of issuance of this report. As to the variables that are used to support decision-making in the accounting organization management, it was evidenced that the "employees' opinion" is little used and that "searches on the internet" positively influence on the actions of control.

Table 5. Estimated results for the explained variable "internal control"

	Coefficient	Standard error	P-value
Number of accounting technicians in the staff	-0.030	0.012	0.008
Up to 50 customers	-1.284	0.670	0.055
Between 51 and 100 customers	-0.406	0.671	0.545
Office's customers belong to the Industrial Sector	-0.039	0.022	0.080
Does not have manual bookkeeping in administrative and financial areas	2.259	1.093	0.039
Does not have manual bookkeeping in managerial area	3.986	1.300	0.002
Rarely uses managerial reports drawn up by computerized systems	-3.285	0.851	0.000
Often uses many managerial reports drawn up by computerized systems	-4.485	1.181	0.000
Rarely uses competitors ' actions in decision-making	-2.242	0.839	0.008
Often uses competitors' actions in decision-making	-0.314	1.764	0.859
Rarely uses customers' opinion in decision-making	-1.362	0.696	0.050
Oftenuses customers' opinion in decision-making	-2.044	0.768	0.008
Rarely uses employees' opinion in decision-making	1.920	0.728	0.008
Oftenuses employees' opinion in decision-making	0.718	0.788	0.363
Rarely uses reports issued by the integrated system	1.594	0.765	0.037
Oftenuses reports issued by the integrated system	2.202	0.838	0.009
Rarely uses managerial information system in decision-making	1.392	0.696	0.045
Often uses managerial information system in decision-making	2.355	0.776	0.002
Rarely uses searches on the internet in decision-making	2.337	0.780	0.003
Often uses searches on the internet in decision-making	2.443	0.788	0.002
Prepares monthly results statement	23.546	0.799	0.000
Prepares quarterly results statement	21.148	0.694	0.000
Prepares annual results statement	20.484	0.615	0.000
Prepares daily budget	-18.779	0.000	0.000
Prepares monthly budget	-5.011	3.552	0.158
Prepares annual budget	4.585	3.130	0.143
Intercept 1	23.673	15.147	0.000
Intercept 2	28.703	214.700	0.000
Pseudo $R^2$of McFadden: 42.57			
AIC: 179.6902			

Source: Survey data.

4.3. The Management System of Accounting Offices in Accordance with the Approach of the Model of Kaplan and Cooper (1998)

To finalize the analysis of the results, this section presents the approach of the four-stage model developed by [24] to categorize the levels of management systems of accounting offices.

As for the results, it was found that, out of the total of the 112 accounting offices surveyed, 32.84%were at *Stage I*. That stage is characterized by offices that present low reliability in financial and accounting reporting; 30.55% were at *Stage II*, which defines offices issuing financial and accounting reports periodically, with a certain degree of reliability; 23.35%were at *Stage III*, which includes offices that use computerized systems for the generation of financial and accounting reports and use these data for the operational and managerial control, and 13.34% were at *Stage IV*, which indicates the use of integrated information systems for the preparation of all financial and accounting reports that are used in the decision-making process ([24]).

Most of the offices were at *Stages I* and *II* (63.39%) and the remaining at *Stages II* and *III* (36.61%). However, in this study it was noticed a trend of migration to *Stages III* and *IV*. It can be seen that these offices have similar characteristics to companies, regarding the need to ensure appropriate management systems. However, there must be reservations about the generalizations of these results, because probably there are different assumptions regarding the understanding, on the part of the respondents, in regard to the quality and levels of integration of systems. But, on the other hand, these evidences were based on the assumptions of the management model of [24]. Motivated by the same interest, [34] also noted that 80% of the processing industries of the State of Pernambuco were at *Stage I* or *II* of the model.

Finally, limiting the universe of variables only to those that have positive or negative effects on the level of integration of the accounting offices, a classification was made to identify at which of the four stages these offices were. An initial consideration is related to the variable "accounting technician", which had to be categorized into the four levels, for a best viewing of each phase of the model (e.g. Table 6).

Certain considerations may be made on the previous results. At first, it is argued that the fact that there are variables that can be statistically significant in explaining the level of integration of the accounting offices does not influence on the integration stage. This is because the proportion of companies along the stages is very similar, even if the effects of the variables on the integrated system are positive or negative. The exceptions are the variables "number of accounting technicians", which tends to increase its proportion as it passes from *Stage II* to *III*, and "managerial information system", which, when widely used by the offices, has the second largest proportion of companies in stage IV.

With respect to the variables that exert positive and negative effects on the internal control of the offices, it also appears that there is no general or global relationship between variables that are statistically significant to explain the internal control of the offices and the stages at which they are. However, there are issues that are important to report. For example, offices that prepare monthly results statements and have customers in larger proportion in the manufacturing sector are the ones which are found in the largest proportion at *Stage IV*. In contrast, offices that rarely use the integrated reporting or rarely use the managerial information system are those which are in the smallest proportion at *Stage IV*.

To finish this section, we present the results obtained to identify the stages of the offices using the statistically significant internal control variables. Thereafter we present the final considerations, conclusions and recommendations for future studies (e.g. Table 7).

Table 6. Stages of the accounting offices, according to the statistically significant variables used to explain the integrated information system

Office	Stage I	Stage II	Stage III	Stage IV
Up to 25%of the staff are accounting technicians	0.161	0.313	0.250	0.277
Between 26% and 50% of the staff are accounting technicians	0.330	0.333	0.226	0.111
Between51% and 75% of the staff are accounting technicians	0.372	0.290	0.203	0.134
Between76% and 100% of the staff are accounting technicians	0.336	0.299	0.254	0.111
Rarely uses intuition in decision-making	0.294	0.301	0.242	0.163
Often uses intuition in decision-making	0.343	0.334	0.222	0.101
Rarely uses customers' opinion in decision-making	0.344	0.277	0.234	0.146
Does not have manual bookkeeping in administrative and financial areas	0.327	0.313	0.231	0.129
Does not have manual bookkeeping in managerial area	0.329	0.303	0.235	0.134
Rarely uses market research in decision-making	0.318	0.270	0.242	0.171
Rarely uses the office database in decision-making	0.335	0.301	0.253	0.110
Rarely uses the managerial information system in decision-making	0.272	0.302	0.220	0.206
Rarely uses Excel spreadsheets in decision-making	0.327	0.298	0.241	0.134
Often uses Excel spreadsheets in decision-making	0.324	0.355	0.215	0.107
Prepares daily cash flow	0.278	0.338	0.221	0.164

Source: Survey data.

Table 7. Stages in which the accounting offices are, according to the statistically significant variables used to explain the implemented internal control

	Stage I	Stage II	Stage III	Stage IV
Up to 25% of the staff area accounting technicians	0.161	0.313	0.250	0.277
Between 26% and 50% of the staff area accounting technicians	0.330	0.333	0.226	0.111
Between51% and 75% of the staff area accounting technicians	0.372	0.290	0.203	0.134
Between76% and 100% of the staff area accounting technicians	0.336	0.299	0.254	0.111
Between 51 and 100 customers	0.336	0.316	0.236	0.112
Up to 25% of customers belong to the Industrial Sector	0.332	0.310	0.231	0.127
Between 26% and 50% of customers belong to the Industrial Sector	0.293	0.291	0.216	0.201
Between51% and 75% of customers belong to the Industrial Sector	-	-	-	-
Between76% and 100% of customers belong to the Industrial Sector	-	-	-	-
Managerial reports prepared from the computerized system	0.331	0.315	0.229	0.124
Managerial reports prepared from the integrated system	0.253	0.281	0.249	0.217
Rarely uses competitors ' actions in decision-making	0.271	0.285	0.229	0.215
Rarely uses customers' ideas in decision-making	0.344	0.277	0.234	0.146
Oftenuses customers' ideas in decision-making	0.334	0.298	0.221	0.146
Prepares daily budget	0.406	0.156	0.156	0.281
Does not have manual bookkeeping in administrative and financial areas	0.327	0.313	0.231	0.129
Does not have manual bookkeeping in managerial area	0.329	0.303	0.235	0.134
Rarely uses employees' opinion in decision-making	0.321	0.293	0.258	0.129
Rarely uses integrated reports in decision-making	0.340	0.320	0.241	0.100
Often uses integrated reports in decision-making	0.291	0.279	0.248	0.181
Rarely uses the managerial information system in decision-making	0.373	0.280	0.254	0.094
Often uses the managerial information system in decision-making	0.272	0.302	0.220	0.206
Rarely uses searches on the internet in decision-making	0.319	0.290	0.244	0.147
Often uses searches on the internet in decision-making	0.305	0.316	0.231	0.148
Prepares monthly results statement	0.229	0.319	0.243	0.209
Prepares quarterly results statement	0.322	0.278	0.242	0.158
Prepares annual results statement	0.362	0.314	0.228	0.097

Note: "-"= not available.
Source: Survey data.

5. Conclusions

This study aimed at analyzing the level of management and internal control of accounting firms, using the four-stage typology developed by [24] for the design of management systems. It was possible to identify the level of integration between areas on the aspects of data quality, reporting, and strategic and operational controls, finding out the degree of use of internal control and integrated systems. Finally, the offices were classified into one of the four stages of management developed in accordance with the model of [24].

The data were collected through questionnaires answered by the accountant partners who worked as administrators of the accounting offices. These respondents deeply knew all the dimensions surveyed as well as the variables that would be present in the management process. So, from the sample consisting of 112 accounting offices, it could be observed that 32.84% of them were at *Stage I*, 30.55% at *Stage II*, 23.35% at *Stage III*, and 13.34% at *Stage IV*.

At *Stage I*, as according to the assumptions of the model, the offices have low reliability in financial and accounting reporting and have features like some sort of bookkeeping that requires time and resources for the consolidation of the different sources of reports and for closing the books at the end of each accounting period. Unexpected variations of the balances at the end of each accounting period and many adjustments entries are common. There is no control of the customers' neither in what concerns revenues nor individualized expenses, and no strategic and operational control is made.

At *Stage II*, the offices meet the requirements of financial reporting, but there is no frequency; they present synthetic results accounts with distorted balances; they do not have control of revenues, costs or expenses with clients, and show limited feedback, without reasonable time for the decision-making. Managerial controls are out dated and limited.

At *Stage III*, the offices use computerized systems for the generation of financial and accounting reports and for operational control. In general, they use systems that run the accounting functions, prepare monthly or quarterly financial

statements and use conventional methods of allocation of costs and expenses. These offices assess with greater precision the cost of activities, services, and clients, and have some type of strategic and operational control, but do not use it frequently.

Stage IV, where only 13.34% of the offices fitted, indicates the use of integrated information systems for the preparation of all financial and accounting reports that are used in decision-making. It is defined as the integration of the management of financial reports, the most advanced stage, and with information generated with reliability and in short time, and the one that prepares periodic statements from the managerial systems; it presents data integration among all organizational areas, including the office's customers; reports are issued frequently; the systems information is used for operational and strategic control, supporting the decision-making.

The results also suggest a lesser concern of some accounting offices with internal controls both in the areas managed by the business owners and in the areas directly related to the service provided. It is to note that this type of organization tends to better manage their processes and thereby to obtain greater reliability on the information produced by the computerized systems, when they have an implemented internal control. In addition, the use of integrated systems between the areas of the office contributes to decrease of rework, increases the possibility of management of information in the short term and provides various reports to support the decision-making.

Finally, it is understood that the management of accounting offices contributes to the improvement of the services they provide and to the increase of the quality and reliability of the information provided, by means of the generation and submission of financial, accounting and managerial reports to their many types of users. This study leaves room for new researches and clarifications on the subject, despite some limitations such as: the offices are located only in the region of Belo Horizonte; the difficulty in validating the four-stage model of Kaplan and Cooper in the offices that have little information about their internal controls and the difficulty of identifying how the decision-making process of the accountants and manager partners works, due to the small size of this type of company. Therefore, we suggest further investigations that try to identify at which of the four stages of management are other accounting offices in Brazil, and the application of the four-stage model to track the migration from a stage to another.

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