

## AUDITING AND EARNINGS MANAGEMENT IN BRAZILIAN HMOs

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### Abstract

This paper examines whether external auditing minimizes the propensity for manipulation of accounting information (MAI) by health maintenance organizations (HMOs), with respect to financial information disclosed to the Brazilian Health Care Agency (ANS). The results of univariate and multivariate analyses and robustness tests indicated no statistically significant differences in the propensity to MAI between audited and unaudited financial reports in the analyzed information. The empirical regularities shown in this study provide useful insights to foreign regulators and international auditors. Our study sheds light on the effectiveness of the recent reporting and auditing regulations in Brazil, suggesting that – in regard to the HMO industry – auditing has not begun to play a more effective role yet.

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### 1. Introduction

The Brazilian *Agência Nacional de Saúde Suplementar* (hereafter ANS), equivalent to the U.S. Federal Government's Office of Health Maintenance Organizations, requires that all Brazilian Health Maintenance Organizations (hereafter HMOs) prepare and submit their

quarterly financial reports in accordance with accounting standards issued by the ANS.

Based on this information, the ANS assesses the performance and solvency of the HMOs. Based on analysis of the financial statements, the ANS rates each HMO's risk for insolvency. If an HMO does not break any pre-established threshold, it is classified as having a low insolvency risk. If a threshold is broken, its insolvency risk is classified

as medium. The HMO would then be subject to more rigorous, ongoing reviews and could be asked to provide what is known as a recovery plan. The recovery plan is subject to ANS approval and consists of a monthly budget based on operating, investing and financing decisions that would minimize the HMO's insolvency risk. In this case the company is also required to submit monthly financial information and other documentation to the ANS. Finally, if the HMO breaks the majority of ANS established thresholds and/or its recovery plan is not successful, its insolvency risk is re-classified as high. The HMO is then subject to direct ANS intervention, including possible discontinuation of the organization's activities and liquidation of its assets. Several parameters are used to identify an HMO's financial standing, including current ratio, profitability, return on assets, and net assets (the latter must be positive, otherwise this is an indicator of insolvency), among others.

This unique institutional setting in the Brazilian HMO market provides a natural experimental setting to directly investigate the effect of auditing in earnings management. The ANS requires HMOs to submit standardized, quarterly financial statements, and only the information in the fourth quarter (year ended 31 December), is audited. Quarterly information (31 March, 30 June and 30 September) does not undergo external auditing. Hence, the research questions addressed are:

**With regards to the economic-financial information the HMOs submitted to the ANS, was the external, independent auditing an important factor? How did the following factors influence the propensity to manipulate accounting information: auditing; the health care services provided (only dental, or medical services in general); the HMO's profit status (for-profit or not-for-profit); the legal structure (cooperative or other); and the number of members in the HMO?**

Common sense suggests an affirmative answer to the first question, precisely because common sense understands this to be the purpose of an auditor. However, if that were the case, a question would soon follow: Why doesn't the ANS require that quarterly statements be audited as well, as do other supervising agencies, including the Brazilian Securities and Exchange Commission (*Comissão de Valores Mobiliários* – CVM) as well as the U.S.'s SEC? The latter question (about the regulator's decision) does not fall within the scope of this paper; however, is useful to consider possible answers. Perhaps the ANS does not require that quarterly statements be audited because it does not attribute great significance to the auditors' work (and reports). If that were so, the ANS would be conducting a cost-benefit analysis, an aspect

emphasized in the Framework for the Preparation and Presentation of Financial Statements, issued by the International Accounting Standards Board (IASB), as a restriction to the qualitative aspects of the accounting information – the balance between benefit and cost (IASB, 2009). What makes analysis of this relationship difficult is that contractual costs fall to the firm while the benefits are shared by all *stakeholders* (existence of externalities – the first rationale for accounting regulation presented by Leuz and Wysocki, 2008, above).

In this paper, we estimate manipulation using discretionary accruals models (Defond & Park, 2001, and Dechow, Sloan, & Sweeney, 1995), an approach consistent with literature on accounting practices. Despite extensive literature about external auditing independence and quality, there appear to be no studies analyzing manipulation of accounting information by comparing audited statements with unaudited statements for the same companies during the same periods.

In order to discuss the expected results for the second research question (which attributes of a firm most influence its accounting quality), we must first provide more details about the context in which the Brazilian HMO industry operates. Hence, the remainder of the paper is structured as follows: the next section presents the theoretical framework. Section three presents the methodology and the following sections, the results and conclusions.

## 2. Theoretical framework

### 2.1 The institutional environment for hmo in brazil

The health maintenance industry was not regulated in Brazil until mid-1998. Then, for 18 months, the health maintenance industry was regulated by the same agency that regulates the insurance industry (under the Finance Ministry). Finally, in 2000, the Health Ministry created the ANS, an agency specifically dedicated to regulating this industry.

In order to reduce information asymmetry between HMOs, the ANS established accounting standards, a chart of accounts and standardized reports that HMOs must prepare and submit to the ANS electronically on a quarterly basis. The ANS examines this information for signs of insolvency and takes actions based on its findings.

As there is a heterogeneous mix of over 2,000 HMOs in Brazil, to regulate this 'culturally unregulated' market the ANS categorized companies according to four attributes. The ANS divides HMOs into three groups based on their size: small (less than 20,000 members), medium (between 20,000 and 100,000 members) and large (more than 100,000 members). In addition to size, it defines five types (modalities): medical

cooperative, dental cooperative, non-profit, group medical, group dental.

For the categories, the ANS considers that the claim volume of exclusive dental health HMOs is significantly lower than the claim volume of all other HMOs. Hence, exclusive dental health HMOs would demand less intense regulatory effort. This paper does not discuss the validity of this assumption.

Since non-profit entities are presumably more committed to public interest than for-profit companies, the ANS tends to be less demanding of them. For instance, if a non-profit HMO is unable to honor commitments to suppliers, the ANS refrains from direct intervention, because the most probable outcome would be bankruptcy on the part of the HMO and its hospital, which is not in the public's best interest – i.e. it is better to have a philanthropic hospital controlled by an insolvent HMO than to have no hospital at all.

Regarding the legal structure, cooperatives have some tax relief; are subject to different labor agreements; are subject to some dividend distribution policy constraints; and when they incur net losses, their owners are required to recapitalize. Non-cooperative, for-profit companies have neither tax exemptions nor dividend policy constraints. The ANS believes that the social costs incurred when a large HMO files for bankruptcy are higher than when a small sized HMO terminates operations. Therefore, the ANS is stricter with large companies than with small ones.

## 2.2 Regulation and Earnings Management

Leuz and Wysocki (2008) review the economic consequences of financial reporting and disclosure regulation. They structure their argument by discussing literature's four main explanations for justifying regulation of firms' financial reporting and disclosure activities: (a) the existence of externalities; (b) market-wide cost savings from regulation; (c) strict sanctions that are difficult to produce privately; and (d) dead-weight costs from fraud and agency conflicts that could be mitigated by disclosure. The ANS primarily bases its financial reporting and disclosure regulation for the HMO industry on the second line of reasoning discussed by Leuz and Wysocki (2008). Considering that the costs of complying with a one-size-fits-all regime are relatively low, standardization of corporate reporting can make it easier for the agency to process the information and to compare across companies.

As Christensen (2009) addresses, managers and other stakeholders have different incentives with regards to accounting information; and this information is provided in an environment characterized by uncertainty and imperfect

information, which leads to asymmetric knowledge and transaction costs.

Laughlin (2007) differentiates between accounting regulation (explained by Leuz & Wysocki, 2008) and regulation of accounting. The latter is reactions by accountants and firms to constraints established by regulators to preserve corporate values they believe are sacred, to the detriment of secular ones. Benham (2005) makes a similar argument in relation to so-called *responses to regulation*.

The earnings management literature says that avoiding political costs (responding to regulation) is one of many incentives for managers to manipulate accounting information. According to the definitions of Schipper (1989), Healy and Wahlen (1999), Fields et al. (2001) and Mckee (2005), manipulation of accounting information (also called *earnings management*) is the preferred accounting practice or operational decision for shaping the information reflected by reports and financial numbers. This indicates that accounting practices and operating decisions can be used to portray specific financial conditions.

Accounting decisions involve choosing accounting practices concerning the following: (a) identification of the phenomenon – acts and facts; (b) measurement of their effects on the firm's performance and net assets; (c) classification; (d) accounting recognition; and (e) presentation and disclosure of the firm's financial position. The literature contains numerous examples of manipulation of accounting information through misleading accounting practices. Of these, we note McNichols and Wilson (1988), Jones (1991), Dechow et al. (1995) and Kang and Sivaramakrishnan (1995).

In Brazil, the study by Martinez (2001) shows that for non-financial companies traded on the domestic stock market the most common manipulation of accounting information aims to avoid lowering net profit and to reduce its volatility (also referred to as *income smoothing*). Also, Fuji (2004) showed that in a sample of the 50 largest Brazilian banks, manipulation of accounting information especially uses the provision account to allow for bad debts. It aims at reducing the political cost related to regulation by the Brazilian Central Bank. There are several other examples along the same line. Cardoso (2005), based on a sample of quarterly financial reports from 2001 through 2003 of more than 1,000 HMOs, showed that HMOs tend to manipulate accounting information to avoid breaking financial thresholds established by the ANS (specifically to avoid reporting net loss and negative net assets).

A second type of manipulation of accounting information employs operating decisions. Mckee (2005) explains this type of manipulation with an example regarding

implementation (or not) of special discounts or special programs to increase sales near the end of a quarter in which income targets were not achieved. Other types of operating decisions include investing in new equipment, hiring new staff etc. These types of manipulation impact the company's cash flow and consequently the income and expenditures associated with these activities. However, there are very few studies in the international literature that deal with this kind of manipulation (Roychowdhury, 2003, 2005; Gunny, 2005; Zang, 2005). Based on Brazilian companies, Martinez and Cardoso (2009) used a sample composed of non-financial, non-insurance and non-HMO firms and showed that companies operating in a more restrictive regulatory environment tend to prefer manipulation via operating decisions as opposed to accounting practices.

### 2.3 Auditing Quality and Relevance

Auditing reduces information asymmetries between managers and stakeholders by allowing outsiders to verify the accuracy of financial statements (Beker, DeFond, Jiambalvo, & SUBRAMANYAM, 1998). For this reason, it is fundamental that external auditing take the term independent very seriously, that means: free of any and all dependence or subjection, and self-supporting. Therefore, autonomy to make decisions and take action is one of the cornerstones of auditing.

Additionally, it is *sine qua non* to ensure that the auditor is in no way dependent on the client by reviewing the percentage of the auditing firm's earnings that these fees account for, thereby demonstrating that the company has no financial influence on the auditing process. *Factors influencing auditor independence [...] size of audit fees received by audit firm (in relation to total percentage of audit revenue)* (Bakar, Rahman, & Rashid, 2005, p. 808). The other five factors these authors note are: the size of the audit firm; the level of competition in the auditing market; the length of time audit services have been provided; whether the firm provides consulting services; whether an audit committee is in place.

Auditor independence has three pillars: independent programming, investigation and reporting. Independent programming requires that the auditor have liberty to plan and carry out his work without any interference or pressure from the audited company's management. Independent investigating is associated with free access to truthful information sources, whereby nothing is

hidden or withheld from the auditor. Independent reporting involves accurately and fully reporting the review without any intervention by the company or its majority stakeholders. Finally, "The auditor has to serve two opposing interests, client companies and the general public." (Alleyne, Devonish, & Alleyne, 2006, p. 622).

### 3. Methodology

This paper works with earnings management (EM) as the discretionary practice managers use to misrepresent a company's real equity position, with the intention of serving personal interests or those of the company.

There are many ways to estimate the MAI (Jones, 1991; Kang & Sivaramakrishnan, 1999; Paulo, 2007); however, a database made available by the ANS contains little information on costs with depreciation. In our analysis, we apply two contemporary measures of earnings management, Abnormal Working Capital Accrual and Discretionary Accruals.

We first applied the AWCA model (DeFond & Park 2001). In order to evaluate the robustness of the results in a sensitivity analysis, we then adopted the Modified Jones model (DECHOW et al, 1995) (hereafter DCA-MJ), adapting it somewhat as explained below.

#### 3.1 Abnormal Working Capital Accruals (AWCA)

The AWCA model, because it uses the working capital as *proxy*, measures only the DCA. This is different than other models (Jones, 1991; Kang & Sivaramakrishnan, 1999; PAULO, 2007), which are broader in scope as they measure discretionary current and non-current accruals. Note that the model's scope does not make it inferior or superior to others; rather, it is a question of being appropriate for the study's objectives or requirements.

Conceptually, the AWCA model measures the perceived difference between the working capital and a *proxy* of expectations on the amount of working capital needed to support the current sales levels. This difference represents a percentage of the rise in working capital, which does not sustain the current sales level (DeFond & Park, 2001).

To determine the DCA, the AWCA model uses the following variables, as described by Defond and Park (2001):

$$AWCA_t = WC_t - [(WC_{t-4}/S_{t-4}) \times S_t] \quad (\text{Equation 1), in which:}$$

- $t$  = year-quarter; thus  $t - 1$  refers to the prior quarter and  $t - 4$  refers to the same quarter in the prior year;
- $AWCA_t$  = abnormal working capital accruals in the current quarter;

- $WC_t$  = noncash working capital in the current quarter computed as (current assets - cash and short-term investments) – (current liabilities – short-term debt);
- $WC_{t-4}$  = working capital in the same quarter last year;
- $S_t$  = sales in the current quarter; and
- $S_{t-4}$  = sales in the same quarter last year.

In order to control firm size, the DCA obtained using the model were scaled by the total equity.

### 3.2 Modified Jones (DCA-MJ)

The Modified Jones model (1995) uses the change in net revenues and in fixed assets, based on the premise that the non-discretionary accruals depend

$$NDA_{it} = \beta_0 [1/A_{it-4}] + \beta_1 [\Delta REV_{it} - \Delta REC_{it}] + \beta_2 [PPE_{it}] + \varepsilon_{it} \quad (\text{Equation 2}).$$

Considering that the DCA-MJ model is reasonable know, we do not present its details. We suggest that who is interested on that, search in the original paper. The parameter estimates for

$$TA_{it}/A_{it-4} = \beta_0 [1/A_{it-4}] + \beta_1 [\Delta REV_{it} - \Delta REC_{it}] + \beta_2 [PPE_{it}] + \varepsilon_{it} \quad (\text{Equation 3}).$$

Note that the original versions of the Jones (1991) and Modified Jones (Dechow *et al*, 1995) treat annually, while this study considered quarterly information. This model measures the current accruals through the variables  $[\Delta REV_{it} - \Delta REC_{it}]$  and the non-current accruals through the variable  $[PPE_{it}]$ .

This study measures only the DCA, considering that manipulation of accounting information in the HMOs generally occurs based on this *proxy*, as supported by the following arguments:

- The HMOs do not submit information on their costs with depreciation, nor did we have access to the Statement of Origins and Application of Funds or the Cash Flow Statement, which makes it unfeasible to calculate using the original model.
- On average, around 27% of the HMOs' assets are fixed (subject to depreciation), which would reduce the possibility of information manipulation through non-current discretionary accruals.
- The current assets (in working capital), on average, represent approximately 60% of the HMOs' total assets, which would increase the possibility for information manipulation through

$$TA_t = NDA_t + DA_t \quad (\text{Equation 4}).$$

### 3.3 Data

This study proposes to investigate whether there is a qualitative difference in audited accounting information as compared to unaudited accounting information. The auditing literature and common sense suggest that audited information is more reliable than unaudited.

on these variables that are measured according to total assets (Martinez & Ramos, 2006).

The DCA-MJ model measures total discretionary accruals (current and non-current) using the following variables, as described by Dechow *et al* (1995):

Equation 2,  $\beta_0$ ,  $\beta_1$  and  $\beta_2$  are generated by Equation 3.

the DCA. In addition, the HMOs must maintain certain liquidity ratios to prove their ability to effect payment, so they are concerned with meeting the minimum levels required by the ANS (Cardoso, 2005).

Therefore, for the purposes of this study, which is to measure the DCA, the depreciation variable was eliminated from the Modified Jones model calculation of total discretionary accruals, and the variable  $[PPE_{it}]$  was eliminated in the non-discretionary accruals calculation.

We based this method on analysis of the model's structure, ensuring that the variables removed would not impact results and that the variables preserved would adequately serve the study's hypotheses.

The calculation basis of the discretionary accruals will be from the non-discretionary accruals and total accruals, as reported by Jones (1991, p.207). DeAngelo (1986) used the prior period's total accruals ( $t - k$ ) as a measure of "normal" total accruals. She defines "abnormal" accrual ( $\Delta TA$ ) as the difference between total current accruals and normal total accruals, which then must be separated into discretionary and non-discretionary:

The documental research included thorough analysis of the accounting information for the HMOs included in the study, which is disclosed quarterly to the ANS. The data was treated with non-parametric statistical methods. Among the many possible statistical models for calculating DCA, we employed the AWCA and DCA-MJ models. With the aim of controlling the variables, a

multivariate test was applied, as seen in other studies (Becker et.al, 1998), in an effort to minimize any differences among groups in the sample.

In response to this problem, the quarterly figures the HMOs submitted to the ANS in the Quarterly Statements (DIOPS) were used, which the ANS made available according to National Council for Scientific and Technological Development (CNPq) case 410612/2006-5.

As Table 1 shows, there were 1,656 HMOs registered with the ANS in 2006. This study used a sample of 415 companies. This sample was selected based on the completeness of data. In order to ensure the reliability of the results, 1,241 companies were excluded from the study due to insufficient or inconsistent data, or because they were dissolved in the 2003-2006 period. When inconsistent information (company/quarter) was found, the company and all its information were removed from the study. Figures from one quarter

would influence calculations for subsequent quarters, this measure helped guarantee the reliability of data.

Although the ANS has quarterly accounting information for the HMOs from the first quarter of 2001 until the last quarter of 2007, this study's observation period included the years 2004 to 2006. The years 2001, 2002 and 2007 were not included due to inconsistent data or insufficient information. Note that the year 2003 was not entirely excluded from the base, as it served as a reference for calculating the year 2004.

After the indispensable treatment by way of calculations required by the AWCA and DCA-MJ models, the sample contained 4,900 observations (companies/quarters), including audited information (fourth quarter) unaudited (for the first three quarters of each year), which could yield valid and accurate estimates based on information available.

TABLE 1  
Sample Composition and Percentage of Audited and Non-Audited Quarters

| HMO Types           | Universe     | Sample      | Percentage |
|---------------------|--------------|-------------|------------|
| Cooperative Medical | 354          | 181         | 51%        |
| Cooperative Dental  | 149          | 29          | 19%        |
| Non-profit          | 246          | 51          | 21%        |
| Group Medical       | 533          | 108         | 20%        |
| Group Dental        | 374          | 46          | 12%        |
| <b>Total</b>        | <b>1,656</b> | <b>415</b>  | <b>25%</b> |
| Quarter             | Audited      | Non Audited | Total      |
| Quantity            | 1,221        | 3,679       | 4,900      |
| Percentage          | 25%          | 75%         | 100%       |

### 3.4 Empirical Research Hypotheses

The information was processed in two different steps. The first phase involved calculations and estimations of the DCA, based equations from the AWCA and DCA-MJ models.

Subsequently, the averages were compared using the Mann-Whitney test, which was indicated given that the variables did not present normal distribution and the numbers of observations were different (Cardoso, Aquino, Almeida, & Neves, 2008). This test is designed to identify the differences in the averages of two samples (audited and unaudited quarters). Additionally, the *Bonferroni* test, suggested by Maijor and Vanstraelen (2006), was applied. This test is designed to compare the difference in averages of different groups.

Therefore, the following null hypotheses were tested:

**H1: the discretionary current accruals identified in the audited quarterly accounting information are not less significant than those in the unaudited quarterly information.**

It is supposed that the DCA would be less significant in the audited information than in the unaudited due to: (i) auditing may prevent manipulation of accounting information practices; and (ii) in the audited periods, managers would feel pressured to report the company's income and equity as they are rather than how they would like them to be; in periods that are not audited they would feel more at liberty (autonomy) to apply discretionary practices to serve personal or company interests.

**H2: the discretionary current accrual levels are the same for the different sized companies.**

It is assumed that the DCA are not equal among the different sized HMOs, but all have the

same auditing requirement, so that no one type registered with the ANS is favored in this way, although International Auditing and Assurance Standards Board (IAASB) argues that auditing criteria are applied to all equally, without regard to the audited company's size, also saying that audit firms must not accept assignments that could compromise their market credibility or any type of incentive for issuing reports they would not issue in neutral or impartial circumstances.

However, Cardoso (2005) shows that ANS monitors the economic-financial position of large HMOs more strictly than small HMOs, because the former represent non-payment risk to a larger percentage of the population in the event of financial instability.

**H3: the discretionary current accrual levels are the same for the different types of companies.**

It is assumed that the DCA are not the same for different HMO types, although the ANS seems less demanding of non-profit HMOs than other types; from the agency's perspective, it is better to have a hospital that (also) offers free services controlled by an insolvent company than to have no hospital at all.

**H4: the discretionary current accrual levels are the same for the different equity positions.**

It is assumed that the DCA are not the same for the HMOs' different equity positions, notwithstanding the same observations raised in hypotheses 2 and 3.

However, Cardoso (2005) identified that the HMOs normally manipulate their accounting information when they are about to report negative equity, because in this case, ANS policy calls for administrative action in the direction of a recovery plan (or more severe measures).

**4. Results**

First the results based on univariate statistics are presented, then those based on multivariate statistics.

**4.1 Results of the Univariate Analysis**

Before calculating the DCA-MJ and AWCA, the following statistical procedures were conducted to eliminate outliers and non-normal distribution.

Following the statistical treatment described, the DCA were determined according to the models' methods. Table 2 shows the DCA averages, with the two models (AWCA and DCA-MJ) as *proxy*. To separate the sample into audited and unaudited, a dummy variable was used called QTRAUDIT (in which: 0 = unaudited quarter and 1 = audited quarter).

Initially we did not aim to verify whether manipulation of accounting information occurs for more or for less (to increase or decrease profit), but rather only whether it exists and whether it is to the same degree in audited information and unaudited information, the absolute value of the DCA was used as a standard.

With the goal of assessing the differences in averages between the DCA in audited quarters and unaudited quarters during the 2004-2006 period, the non-parametric Mann-Whitney test was applied; these results are presented in Table 2.

Based on the *p-value* (0.711) in the AWCA model and the *p-value* (0.683) in the DCA-MJ, there is not sufficient statistical evidence to reject the null hypothesis, at a confidence level of 0.05. Therefore, the averages of the DCA in the audited quarters do not present significant differences compared to the averages for the unaudited quarters.

Thus, hypothesis H1, holding that external, independent auditing would not minimize HMOs' propensity to manipulate accounting information (measured by DCA) was not rejected, at least with regards to the economic-financial information submitted to the ANS by the HMOs that comprised the final sample of this analysis.

TABLE 2  
Descriptive Statistics of Discretionary Accruals per Audited and Non-audited Quarters

| Auditors         | Quarter | Percentage | AWCA   |          |        |        | DCA-MJ |          |        |
|------------------|---------|------------|--------|----------|--------|--------|--------|----------|--------|
|                  |         |            | Mean   | Variance | Min    | Max    | Mean   | Variance | Min    |
| Audited (AD)     | 1,221   | 25%        | 0.2341 | 0.1140   | 0.0003 | 4.9353 | 0.2055 | 0.0600   | 0.0001 |
| Non Audited (NA) | 3,679   | 75%        | 0.2348 | 0.1300   | 0.0000 | 7.2079 | 0.2047 | 0.0540   | 0.0000 |

Non-parametric Mann Whitney test for mean differences between Audited and Non-audited Quarters

| Auditors | AWCA             |                | DCA-MJ           |                |
|----------|------------------|----------------|------------------|----------------|
|          | Mean Differences | <i>p-value</i> | Mean Differences | <i>p-value</i> |
| AD - NA  | -0.0007          | 0.711          | 0.0008           | 0.683          |

To strengthen the robustness of the results, the DCA over the quarters were also examined according to the signs (positive or negative). The positive DCA indicated that a company is manipulating to increase income, while the negative sign indicates that income is being decreased. Effort was made to verify whether more liberties are taken with regards to the DCA in some quarters than in others. Likewise, the question arises whether auditing effectively minimizes one type of manipulation more than the other (increasing income as opposed to decreasing it). However, due statistical testing, did not indicate significant differences in the DCA even when classified by sign or quarter.

As to the effects of size on MAI, the following classification was employed: small sized, medium sized and large sized. This classification

by size is based on the number of members, as follows: (i) small sized: HMOs with less than 20,000 members enrolled; (ii) medium sized: HMOs with more than 20,000 and less than 100,000; (iii) large sized: HMOs with more than 100,000 members enrolled.

The sample analyzed in this study shows the following distribution of HMOs by size, as seen in Table 3, as well as the descriptive analysis of the DCA by size as measured by the AWCA and DCA-MJ models.

In order to verify the difference among DCA averages for the different HMO sizes in the 2004-2006 periods, the non-parametric *Bonferroni* test, suggested by Maijor and Vanstraelen (2006), was employed. Application of this test aimed to compare the differences in averages; these results are shown in Table 3.

TABLE 3

Descriptive Statistics of Discretionary Current Accruals by HMO Size

| HMO Size          | Quarters | Percentage | AWCA   |          |        |        | DCA-MJ |          |        |        |
|-------------------|----------|------------|--------|----------|--------|--------|--------|----------|--------|--------|
|                   |          |            | Mean   | Variance | Min    | Max    | Mean   | Variance | Min    | Max    |
| Small Sized (SS)  | 3,104    | 63%        | 0.2527 | 0.1340   | 0.0000 | 7.2079 | 0.2254 | 0.0650   | 0.0000 | 3.0887 |
| Medium Sized (MS) | 1,424    | 29%        | 0.2013 | 0.1100   | 0.0000 | 6.8345 | 0.1710 | 0.0340   | 0.0000 | 1.3447 |
| Large Sized (LS)  | 372      | 8%         | 0.2113 | 0.1170   | 0.0001 | 2.9363 | 0.1633 | 0.0470   | 0.0006 | 2.4904 |

Non-parametric Bonferroni test for mean differences by quarter for HMO Sizes

| HMO Size | AWCA             |         | DCA-MJ           |         |
|----------|------------------|---------|------------------|---------|
|          | Mean Differences | p-value | Mean Differences | p-value |
| SS - MS  | 0.0514           | 0.000   | 0.0544           | 0.000   |
| SS - LS  | 0.0414           | 0.100   | 0.0621           | 0.000   |
| MS - LS  | -0.0100          | 1.000   | 0.0077           | 1.000   |

Thus, the alternative hypothesis that the DCA in accounting information varies in different sized companies could not be totally accepted. The only information that does not show significant differences between the DCA averages is between medium and large sized companies. In the others (small sized and medium sized; small sized and large sized) the alternative hypothesis was accepted. We can also conclude that, based on the tests conducted, the HMOs classified as small show greater likelihood of manipulating accounting information, at least with regards to the economic-financial information submitted to the ANS by the HMOs that comprised the final sample of this analysis.

With regards to the effects of HMO type on MAI, hypothesis H3 was tested using the classification proposed by the ANS in eight types, as follows: health plan administrators; cooperative medical; cooperative dental; non-profit institutions;

self-managed providers (sponsored and unsponsored); health insurance companies; group medical; and group dental.

The sample analyzed in this study shows the following distribution of HMOs by type, as seen in Table 4, as well as the descriptive analysis of the DCA, by type, as measured by the AWCA and DCA-MJ models.

The *proxies* used show that the Cooperative Medical type presents the lowest DCA both in the AWCA and DCA-MJ models. The types presenting the highest DCA in the analyzed period were the Group Dental (AWCA) and Group Medical (DCA-MJ).

In order to verify the difference between the averages of DCA for the different HMO types in the 2004-2006 periods, the non-parametric *Bonferroni* test was employed. This test compared the difference in the groups' averages; these results are shown in Table 4.

| HMO Types                | Quarters | Percentage | Mean   | Variance | Min    | Max    | Mean   | Variance | Min    |
|--------------------------|----------|------------|--------|----------|--------|--------|--------|----------|--------|
| Cooperative Medical (CM) | 2,161    | 44%        | 0.1688 | 0.0560   | 0.0001 | 6.8345 | 0.1562 | 0.2500   | 0.0000 |
| Cooperative Dental (CD)  | 348      | 7%         | 0.2855 | 0.2330   | 0.0000 | 4.9353 | 0.2070 | 0.0490   | 0.0003 |
| Non-profit (NP)          | 608      | 12%        | 0.2502 | 0.0980   | 0.0000 | 2.7647 | 0.2107 | 0.0570   | 0.0014 |
| Group Medical (GM)       | 1,255    | 26%        | 0.2882 | 0.1260   | 0.0002 | 3.5815 | 0.2619 | 0.0930   | 0.0002 |
| Group Dental (GD)        | 528      | 11%        | 0.3254 | 0.3440   | 0.0013 | 7.2079 | 0.2605 | 0.0710   | 0.0009 |

**Bonferroni test mean difference of Quarters by HMO Types**

| HMO Types | Mean Differences | p-value |
|-----------|------------------|---------|
| CM - CD   | -0.1167          | 0.000   |
| CM - NP   | -0.0814          | 0.000   |
| CM - GM   | -0.1194          | 0.000   |
| CM - GD   | -0.1566          | 0.000   |
| CD - NP   | 0.0353           | 1.000   |
| CD - GM   | -0.0027          | 1.000   |
| CD - GD   | -0.0399          | 0.986   |
| NP - GM   | -0.0380          | 0.284   |
| NP - GD   | -0.0752          | 0.003   |
| GM - GD   | -0.0372          | 0.401   |

Thus, the alternative hypothesis that the DCA in accounting information are different for different company types was not rejected.

As to the effects of equity position on MAI, two groups were defined with regards to equity position, as follows: (i) Positive Equity: HMO with Equity equal to or greater than 5% of Total Capital and (ii) Negative Equity or Almost Zero Equity: HMO with Equity less than 5% of Total Capital.

To determine the proxy of the Group with Negative Equity or Almost Zero Equity at the level of 5% of Total Capital, study results were used

(Cardoso, 2005; Cupertino 2004) that indicated that when companies approached or maintained equity of almost zero, zero or less than zero they would be more likely to manipulate accounting information to avoid administrative procedures by regulatory agencies, reporting low but positive equity.

The sample analyzed in this study shows the following distribution of HMOs by equity position, as seen in Table 5, as well as the descriptive analysis of the DCA by equity position as measured by the AWCA and DCA-MJ models.

TABLE 5  
Descriptive Statistics for Discretionary Current Accruals by Equity Position

| Equity Position  | Quarters | Percentage | AWCA   |          |        |        | DCA-MJ |          |        |        |
|--|----------|------------|--------|----------|--------|--------|--------|----------|--------|--------|
|  |          |            | Mean   | Variance | Min    | Max    | Mean   | Variance | Min    | Max    |
| Positive Equity (POS_EQ)                               | 4,478    | 91%        | 0.2165 | 0.1140   | 0.0000 | 7.2079 | 0.1886 | 0.0410   | 0.0000 | 1.8468 |
| Negative Equity or Equity near zero (NEG_EQ_NEAR_ZERO) | 422      | 9%         | 0.4273 | 0.2140   | 0.0000 | 3.0853 | 0.3776 | 0.1780   | 0.0008 | 3.0886 |

**Non-parametric Mann Whitney test for mean differences by equity position**

| Equity Position           | AWCA             |         | DCA-MJ           |         |
|---------------------------|------------------|---------|------------------|---------|
|                           | Mean Differences | p-value | Mean Differences | p-value |
| POS_EQ - NEG_EQ_NEAR_ZERO | -0.2108          | 0.000   | -0.1890          | 0.000   |

Based on the p-value (0.000) in the AWCA model and the p-value (0.000) in the DCA-MJ, there is sufficient statistical evidence to reject the null

hypothesis, at a confidence level of 0.05. Therefore, the averages of the DCA in the quarters with positive equity present significant differences

compared to the averages of the quarters with negative equity or equity close to zero.

Hence, the alternative hypothesis that the HMOs with negative or almost zero equity are more likely to manipulate accounting information was accepted, consistent with the findings of Cardoso (2005).

#### 4.2 Results of the Multivariate Analysis

In order to improve the univariate analysis of the previous section, a multivariate analysis was employed as well, which according to Corrar, Paulo and Dia Filho (2007):

$$AWCA = \alpha_0 + \alpha_1(GD\_DUM) + \alpha_2(CM\_DUM) + \alpha_3(CD\_DUM) + \alpha_4(NP\_DUM) + \alpha_5(LS\_PORT) + \alpha_6(MS\_PORT) + \alpha_7(QTRAUDIT) + \alpha_8(EQ\_POSITIVE) + \varepsilon_{it} \text{ (Equation 5),}$$

$$DCA-MJ = \alpha_0 + \alpha_1(GD\_DUM) + \alpha_2(CM\_DUM) + \alpha_3(CD\_DUM) + \alpha_4(NP\_DUM) + \alpha_5(LS\_PORT) + \alpha_6(MS\_PORT) + \alpha_7(QTRAUDIT) + \alpha_8(EQ\_POSITIVE) + \varepsilon_{it} \text{ (Equation 6),}$$

in which we use dummies as control variables :

- GD\_DUM = Dummy Variable (Group Dental = 1, or = 0) control variable;
- CM\_DUM = Dummy Variable (Cooperative Medical = 1, or = 0) control variable;
- CD\_DUM = Dummy Variable (Cooperative Dental = 1, or = 0) control variable;
- NP\_DUM = Dummy Variable (Non-profit = 1, or = 0) control variable;
- LS\_PORT = Dummy Variable (Large Sized = 1, or = 0) control variable;
- MS\_PORT = Dummy Variable (Medium Sized = 1, or = 0) control variable;
- QTRAUDIT = Dummy Variable (audited quarter = 1, or = 0); control variable;
- EQ\_POSITIVE= Dummy Variable (equity equal to or greater than 5% Total Capital = 1, or = 0) control variable.

Table 6 shows the results of the regression of the DCA, measured by the AWCA model and by

[...] can be defined as a set of methods allowing simultaneous analysis of the data collected for one or more sets of individuals (populations or samples) characterized by more than two correlated variables [...] only multivariate statistics techniques helps assess the joint performance of the variables and identify the influence or importance of each in the presence of the others.

Using the multivariate analysis, a model can be created that better describes the relationship between the dependent variable (DCA) and the multiple independent variables. Therefore, the following model was used:

the DCA-MJ model, with the following references: Group Medical and Small Sized.

TABLE 6  
Multivariate Regression Results

|                      | AWCA        |              |         | DCA-MJ      |              |         |
|----------------------|-------------|--------------|---------|-------------|--------------|---------|
|                      | Coefficient | Stand. Error | p-value | Coefficient | Stand. Error | p-value |
| Intercept            | 0.4623      | 0.0188       | 0.0000  | 0.4264      | 0.0122       | 0.0000  |
| GD_DUM               | 0.0378      | 0.0180       | 0.0359  | -0.0038     | 0.0117       | 0.7458  |
| CM_DUM               | -0.1030     | 0.0124       | 0.0000  | -0.0917     | 0.0081       | 0.0000  |
| CD_DUM               | -0.0015     | 0.0211       | 0.9449  | -0.0581     | 0.0137       | 0.0000  |
| NP_DUM               | -0.0433     | 0.0171       | 0.0115  | -0.0582     | 0.0111       | 0.0000  |
| LS_DUM               | -0.0321     | 0.0191       | 0.0931  | -0.0616     | 0.0124       | 0.0000  |
| MS_DUM               | -0.0399     | 0.0111       | 0.0003  | -0.0475     | 0.0072       | 0.0000  |
| QTRAUDIT             | 0.0024      | 0.0114       | 0.8332  | -0.0036     | 0.0074       | 0.6249  |
| EQ_POSITIVE          | -0.1831     | 0.0179       | 0.0000  | -0.1660     | 0.0117       | 0.0000  |
| <b>R<sup>2</sup></b> | <b>5%</b>   |              |         | <b>9%</b>   |              |         |

Based on the coefficients calculated using the multiple regression, all the possible combinations of variables were used: type, size, whether or not audited and the company's Equity position, as shown in Table 7.

We then present, in Table 8, a ranking of the first ten positions, ordered from highest to the lowest (discretionary current accrual) combination seen, as well as the last ten positions.

Based on the ranking we see which HMO condition(s) present(s) the greatest or least probability of manipulating accounting information submitted to the ANS. We note that 70% of the information for these models in the first and last ten positions is consistent with one another; that is to say, seven of the ten HMOs in the first positions based on the AWCA model are also in the first ten

positions by the DCA-MJ model, and the same occurs for the last positions.

We underscore the equity position, where for both models (AWCA and DCA-MJ) the first ten positions in the ranking are occupied by HMOs that

have negative or almost zero equity, while the last ten are HMOs with positive equity, supporting the findings in the univariate analysis (H4) and the results presented by Cardoso (2005).

TABLE 7  
Discretionary Current Accruals from Combined Effect

| HMO Type                   | AWCA   |        |        |        |        | DCA-MJ |        |        |        |        |
|----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                            | GM     | GD     | CM     | CD     | NP     | GM     | GD     | CM     | CD     | NP     |
| SS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.4623 | 0.5001 | 0.3593 | 0.4608 | 0.4190 | 0.4264 | 0.4226 | 0.3347 | 0.3683 | 0.3681 |
| SS_NAUDIT_POS_EQ           | 0.2792 | 0.3170 | 0.1761 | 0.2777 | 0.2359 | 0.2604 | 0.2566 | 0.1687 | 0.2023 | 0.2021 |
| SS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.4647 | 0.5025 | 0.3617 | 0.4632 | 0.4214 | 0.4300 | 0.4262 | 0.3383 | 0.3719 | 0.3718 |
| SS_AUDIT_POS_EQ            | 0.2816 | 0.3194 | 0.1785 | 0.2801 | 0.2383 | 0.2640 | 0.2602 | 0.1723 | 0.2059 | 0.2058 |
| MS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.4224 | 0.4602 | 0.3194 | 0.4209 | 0.3791 | 0.3789 | 0.3751 | 0.2872 | 0.3208 | 0.3206 |
| MS_NAUDIT_POS_EQ           | 0.2393 | 0.2771 | 0.1363 | 0.2378 | 0.1960 | 0.2129 | 0.2091 | 0.1212 | 0.1548 | 0.1546 |
| MS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.4248 | 0.4626 | 0.3218 | 0.4233 | 0.3815 | 0.3825 | 0.3787 | 0.2908 | 0.3244 | 0.3243 |
| MP_AUDIT_POS_EQ            | 0.2417 | 0.2795 | 0.1387 | 0.2402 | 0.1984 | 0.2165 | 0.2127 | 0.1248 | 0.1584 | 0.1583 |
| LS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.4302 | 0.4680 | 0.3272 | 0.4287 | 0.3869 | 0.3648 | 0.3610 | 0.2731 | 0.3067 | 0.3066 |
| LS_NAUDIT_POS_EQ           | 0.2470 | 0.2849 | 0.1440 | 0.2456 | 0.2037 | 0.1988 | 0.1950 | 0.1071 | 0.1407 | 0.1405 |
| LS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.4326 | 0.4704 | 0.3296 | 0.4311 | 0.3893 | 0.3684 | 0.3646 | 0.2768 | 0.3104 | 0.3102 |
| LS_AUDIT_POS_EQ            | 0.2495 | 0.2873 | 0.1464 | 0.2480 | 0.2062 | 0.2024 | 0.1986 | 0.1108 | 0.1443 | 0.1442 |

Leading the ranking are the Group Medical and Group Dental types, which were cited as the HMOs that would be most likely to manipulate accounting information, and they are also small sized, another factor that would encourage this

practice. Conversely, at the bottom of the ranking the Cooperative Medical type predominates, in medium and large sized companies, which would be less inclined to manipulate accounting information.

TABLE 8  
Ranking - Discretionary Current Accruals from Combined Effect

| Position | HMO Type                      | AWCA   | Position | HMO Type                      | DCA-MJ |
|----------|-------------------------------|--------|----------|-------------------------------|--------|
| 1        | GD_SS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.5025 | 1        | GM_SS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.4300 |
| 2        | GD_SS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.5001 | 2        | GM_SS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.4264 |
| 3        | GD_LS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.4704 | 3        | GD_SS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.4262 |
| 4        | GD_LS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.4680 | 4        | GD_SS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.4226 |
| 5        | GM_SS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.4647 | 5        | GM_MS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.3825 |
| 6        | CD_SS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.4632 | 6        | GM_MS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.3789 |
| 7        | GD_MS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.4626 | 7        | GD_MS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.3787 |
| 8        | GM_SS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.4623 | 8        | GD_MS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.3751 |
| 9        | CD_SS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.4608 | 9        | CD_SS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.3719 |
| 10       | GD_MP_NAUDIT_NEG_EQ_NEAR_ZERO | 0.4602 | 10       | NP_SS_AUDIT_NEG_EQ_NEAR_ZERO  | 0.3718 |
| (...)    | (...)                         | (...)  | (...)    | (...)                         | (...)  |
| 50       | NP_SS_NAUDIT_NEG_EQ_NEAR_ZERO | 0.2359 | 50       | NP_MS_AUDIT_POS_EQ            | 0.1583 |
| 51       | NP_LS_AUDIT_POS_EQ            | 0.2062 | 51       | CD_MS_NAUDIT_POS_EQ           | 0.1548 |
| 52       | NP_LS_NAUDIT_POS_EQ           | 0.2037 | 52       | NP_MS_AUDIT_POS_EQ            | 0.1546 |
| 53       | NP_MS_AUDIT_POS_EQ            | 0.1984 | 53       | CD_LS_AUDIT_POS_EQ            | 0.1443 |
| 54       | NP_MS_NAUDIT_POS_EQ           | 0.1960 | 54       | NP_LS_AUDIT_POS_EQ            | 0.1442 |
| 55       | CM_SS_AUDIT_POS_EQ            | 0.1785 | 55       | CD_LS_NAUDIT_POS_EQ           | 0.1407 |
| 56       | CM_SS_NAUDIT_POS_EQ           | 0.1761 | 56       | NP_LS_NAUDIT_POS_EQ           | 0.1405 |
| 57       | CM_LS_AUDIT_POS_EQ            | 0.1464 | 57       | CM_MS_AUDIT_POS_EQ            | 0.1248 |
| 58       | CM_LS_NAUDIT_POS_EQ           | 0.1440 | 58       | CM_MS_NAUDIT_POS_EQ           | 0.1212 |
| 59       | CM_MS_AUDIT_POS_EQ            | 0.1387 | 59       | CM_LS_AUDIT_POS_EQ            | 0.1108 |
| 60       | CM_MS_NAUDIT_POS_EQ           | 0.1363 | 60       | CM_LS_NAUDIT_POS_EQ           | 0.1071 |

With regards to the auditing factor, the results of the multivariate analysis support the results of the univariate analysis for H1: both in the first ten and last ten positions, audited information alternates with unaudited information.

## 5. Conclusions

The purpose of this study was to verify the effect of external auditing on information that HMOs report to the Brazilian Healthcare Agency (ANS). To this end, tests were conducted on the hypothesis that the tendency to manipulate accounting information would be inhibited by external auditing, which is required of all HMOs at the close of the fourth quarter each year. The results indicate that external auditing (independent) does not significantly restrain the inclination to manipulate accounting information, at least for the companies analyzed in the period from 2004 to 2006. This finding contradicts literature on the subject, but supports the understanding of former ANS employees that independent audit reports have little importance for analyzing the HMOs' economic-financial positions. These results also support the findings of Becker et al (1998), albeit indirectly and partially, because only 2.40% of the independent auditors' reports on the HMOs' financial statements were issued by Big-5 audit firms, and 5.29% by Big-11 firms (CVM' ranking). Note that this statistic refers to the 208 independent audit reports for HMOs in the period from 2001 to 2007, randomly selected by ANS technicians, and therefore does not refer to the sample used to test this paper's hypothesis 1.

As noted, the company's size and equity position significantly influence the likelihood that accounting information will be manipulated. The smaller the size, and consequently the less pressure that the company will come under review, the more tendency it will have to manipulate its information. In relation to the companies with negative equity or almost zero equity, they too would be more likely to manipulate accounting information, possibly with the goal of reaching ANS required minimums.

The study's acknowledged limitations involve the statistical methods used, as well as the incomplete or inconsistent information on some of the HMOs submitted to the ANS, which made it unfeasible to expand the sample or analyze the HMOs as a whole. The study is also limited to the period analyzed, which included the years 2004 to 2006. Finally, its scope went only as far as the HMOs reporting to the ANS. Consequently, these results must not be generalized for companies from other sectors or for previous or subsequent periods.

Notwithstanding these limitations, the study's findings are highly important for accounting literature and corporate governance, owing to the paper's critical discussion of the social role of one of accounting information's key intermediaries, which is external (independent) auditing. It may raise issues on the regulation of external auditing of HMOs' financial statements, for example the ANS could establish, together with Brazilian board equivalent to the IAASB (or with international supervisors of the HMO industry, or

even with the International Auditing and Assurance Standards Board): basic procedures and the minimum scope of these audits, and that auditors be registered with the ANS to audit HMOs' accounting information, rather than with the CVM (SEC of Brazil), as under the current system, because less than 1% of the HMOs are joint stock companies, much less open capital. It is also useful in helping the ANS monitor HMOs, whether by type, size or equity position, as concerns manipulation of accounting information.

With the aim of continuing and expanding investigation about the effects of independent auditing on manipulation of accounting information, suggestions would be as follows:

- Investigate the possible causes or incentives that prevent independent audits from mitigating information asymmetry between HMOs and the ANS.

- Investigate the quality of the audit reports generated by HMO contracted companies, as well as the true reasons that the ANS does not require auditing for accounting information in the first three quarters, but only for the last quarter of the year.

- Investigate similar situations in other regulated markets, like Insurance, Pension Funds and Financial Institutions.

Lastly, the difficulties in conducting this study are related to access to HMO disclosed accounting information. Possible explanations for delayed access to the accounting data are connected, from the cultural implications of disclosing this information to the market, to the companies' governance policies, also including the still young regulatory process governing the companies in question.

The empirical regularities shown in this study provide useful insights to foreign regulators and international auditors. As a member of the World Trade Organization, Brazil is attracting more and more direct and financial investment from the international community. Health care is a hot issue under debate in the US, UK and Continental European countries. Brazil choose the HMO industry as a mean to provide health assistance to its citizens and avoid investing much more public funds to provide health services – this may be an alternative to others developing economies. The regulation set of the HMO industry applied in Brazil and its consequences on the quality of accounting information may be an issue of interest for foreign regulators. Our findings suggest that the quality of accounting information is not affected if financial reports are audited. Our study sheds light on the effectiveness of the recent reporting and auditing regulations in Brazil, suggesting that – in regard to the HMO industry – auditing has not begun to play a more effective role yet.

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