The Relevance of Accounting Information in the Process of Valuation of Companies in the New and Old Economy – An Analysis of Asset Investments and their Effects on the Value Relevance of Earnings and Book Value

Amaury José Rezende
Federal University of Mato Grosso do Sul

ABSTRACT: Brazilian accounting principles permit companies to capitalize expenditures on research and development, specifically as deferred charges. Therefore, the objective of this article is to analyze the effects of (deferred) investments on the value-relevance of the earnings and net equity of companies operating in the so-called new and old economies, with the sectors of the old economy chosen as comparison. The more specific objective is to examine: (i) the explanatory power of earnings and net equity; (ii) the incremental explanatory power of deferred charges, in which the stock price is a function the net earnings plus net equity less deferred charges. This study does not seek to refute or prove a specific model, but rather only to gather evidence to permit accepting or rejecting the hypotheses formulated and to offer a response to the research question. The results show that accounting information, for both sectors, is relevant to value the price of shares. However, the results on the explanatory power of deferred charges run counter to the expected results.

Key words: accounting information, value relevance.

Received in 01/05/2005; revised in 14/06/2005; accept in 14/06/2005.

*Corresponding authors:
Amaury José Rezende
Doutor em Controladoria e Contabilidade
Universidade de São Paulo
Address: Avenida dos Bandeirantes nº 3900 Sala 14C,
Monte Alegre, 14040900 - Ribeirão Preto – SP – Brazil
Email: brasilamauryj@usp.br
Telephone: (16) 36020503
I. INTRODUCTION

Financial academics have conducted studies for decades on value relevance, in which accounting variables (profit and net equity) are used as proxies to appraise the prices and return of companies. In this sense, this work seeks to verify the incremental explanatory power of intangible assets booked by Brazilian companies, and whether they are statistically significant.

Amir and Lev (1996) examined the relevance of accounting and non-financial information about cellular telephone companies. The authors asked: “[...] can accounting information be used in predicting the value of high-tech firms?”, concluding that current accounting procedures are incapable of demonstrating what occurs with companies in this segment. They state that one of the factors responsible for the weak performance of accounting numbers is the fact that American companies prepare their accounts according to US-GAAP, which do not allow companies to capitalize outlays on intangibles such as research and development (R&D).

Aboody and Lev (1998), Lev and Zarowin, (1999) and Amir, Lev and Sougiannis (1999) argue that accounting should capitalize R&D expenses, since these are relevant to explain the price and return of companies’ shares.

Faced with the claims presented, this study is focused on investigating listed Brazilian corporations, since Brazilian GAAP have a certain peculiarity in relation to booking intangibles. In this fashion, the question investigated is: What relevance do accounting variables have in explaining the price behavior of the shares of Brazilian new-economy companies that are listed on stock exchanges?

It must be stressed that the research question does not seek to refute or prove a specific model, but only tries to find evidence to permit rejecting or accepting the hypotheses raised, and in this way to offer an answer to the a priori question.

Specifically we estimated regressions between 1995 and 2003, and used the $R^2$ as a metric to evaluate the explanatory power of the variables, finding: (i) the explanatory power of earnings and net equity; and (ii) the incremental explanatory power of deferred charges, in which the stock price is a function of net earnings and equity minus deferred charges.

In summary, this study investigated the relevance of profit, equity and deferred charges. The conceptual basis used to evaluate the explanatory power of these variables is that proposed by Ohlson (1995), which expresses prices as a function of earnings and equity.

The relevance of this work rests in verifying the economic and financial importance of accounting for intangible assets (deferred charges) in the process of company valuation.

The article is divided into four sections besides this introduction. The second section discusses the relevance of accounting information and valuation models, the third deals with methodological aspects, the fourth presents the results and the fifth the conclusions.

II. THE RELEVANCE OF ACCOUNTING INFORMATION AND THE CAPITAL MARKET

Accounting research on the capital market traces its roots in the second half of the 1960s. Kothari (2001) points out that the main researchers at the time were Fama (1965), Ball and Brown P. (1968) and Beaver (1968). Among the works published then, [that] of Ball and Brown (1968) [is?] considered precursors. Their research sought to relate accounting information and the capital market, with the authors concluding that earnings announcements added informative value for the capital market, and that abnormal profits adjusted gradually.
during the year studied. They also found that not all the information was fully anticipated by the market and there was some market movement that persisted after the accounting announcements.

The study by Foster (1997) presented similar results and conclusions to those of Ball and Brown (1968). Later, Beaver, Clarke and Wright (1979) investigated the existence of a relationship between the magnitude of variations in earnings and returns, showing that there is a direct relation between the percentage of abnormal earnings and the annual average of abnormal returns. Beaver, Lamber and Morse (1980) presented similar results and conclusions.

Other works carried out within this same line of research reveal interesting results on the relation between accounting and the capital market, such as the study by Beaver (1968a), which looked into the informative content of the components of accounting, in which he investigated both the market reaction to the disclosure of earnings and the variance of abnormal returns. In this context, also standing out are the works on the behavior of earnings and returns over time written by Board and Walker (1990) and Strong and Walker (1989).

The study by Strong and Walker (1989), inspired by the work of Lev (1989), investigated "accounting earnings and their importance to investors". The authors concluded that $R^2$ (adjusted) is a measure that can help uncover the degree of utility of accounting earnings and the predictability of the variation of returns, and also posited that the utility level of earnings is modest and explains only 5% of the variation in returns. They stressed that the weak explanatory power of the variables was justified because of the accounting practices employed.

In the context of the Brazilian capital market, Lopes (2001 and 2002) investigated the relationship between earnings and stock prices, stating that earnings and dividends offered evidence of superiority when compared to cash flow. Lopes’ results are consistent with the studies of Ball et al. (2001) and Ball and Shivakumar (2001).

The relevance of other financial information, such as analysts’ forecasts, was also studied by Francis et al. (2002), who investigated whether analysts’ publications reduced or eliminated the usefulness of earnings announcements. The authors did not manage to prove that the relation between analysts’ reports and earnings announcements is negatively correlated, or at least are substitutes.

For Bezerra and Lopes (2004, p 134-135), studies that examine the connection of accounting numbers and the capital market can be summarized into three groups: the market’s reaction to new information generated by accounting; changes in the behavior of the relation between stock returns and accounting numbers; and the relevance of accounting information compared with non-financial information.

### 2.1 Investments in intangibles and their effects on the value relevance of earnings and net equit

On the subject of the relevance of the information produced by financial accounting for companies with a high concentration of intangible assets, Lev (1997) and Lev and Amir (1996) argued that this information is of limited usefulness to evaluate companies in the technology and services sector (telecommunications and high-tech), which invest significant amounts in intangibles, such as research and development, human capital and trademark development.

In this context, Lev (1997) pointed out that American financial accounting is limited to capitalizing intangible assets only in certain circumstances, such as an acquired intangible,
which limits the utility of accounting information of companies that have large sums of uncapitalized intangibles.

Other observations in the studies of Lev and Amir (1996) are that earnings, net equity and free cash flow are irrelevant to determine the value of mobile telephone companies, which are characterized for their high concentration of intangible assets. In this context, Collins et al. (1997, p.42-43) stressed that “[...] a priori we have no way to predict how the accounting treatment of intangibles can affect the relative importance of earnings and net equity at the same time.”

Also in this line, Amir, Lev and Sougiannis (1999) reported that analysts’ forecasts are more consistent for companies with a high concentration of intangible assets. They also observed that the accounting numbers of American companies with a high concentration of intangible assets do not appear to be relevant regarding analysts’ forecasts.

Consequently, the justification for these facts can be explained because American accounting standards (US-GAAP) do not permit capitalizing R&D or other expenses of this nature.

Corroborating this argument, Amir, Lev and Sougiannis (1999) found that the higher was the percentage of R&D capitalized, the lower $R^2$ (adjusted) was in the regressions.

Moreover, Lev and Zarowin (1999) argued that the failure to include intangible assets in the financial statements is partly responsible for the decline (loss) of relevance of accounting numbers, both in current assessment of stock prices and in forecasting returns.

Aboody and Lev (1998) concluded that the capitalization of intangibles summarizes and offers relevant information to investors in general. The authors point out that intangibles, such as R&D expenditures, should be brought back to financial statements. They also show evidence that the non-capitalization of intangibles is associated with large errors in analysts’ earnings predictions.

Besides the statistical evidence found regarding the explanatory power of accounting numbers (Lev, 1989), Lev and Radhakrishnan (2003) found evidence that investors recognize the importance of intangible capital. Besides this, the authors attribute the failure or insufficiency of the market as a result of the poor demonstration of information on companies’ intangible capital.

In Brazil specifically, Lopes (2001), in studying a sample of companies in 1998 and 1999, found that the accounting figures of firms in the new economy have better explanatory power than the numbers of old-economy firms. Consequently, he says that this evidence found in the Brazilian market runs counter to the results shown by Lev (1989). Lopes (2001) stresses that this superiority warrants further investigation, but possibly can be explained by the fact that BR-GAAP permits capitalizing R&D expenditures and amortizing them over 10 years.

2.2 Accounting Information and Valuation Models

Accounting is becoming increasingly important in the process of performance forecasting and valuation of companies. Lee (1999) points out that there is still room for growth in this field, which offers many opportunities and challenges.

Among the existing studies on company valuation, the work of Ohlson (1995) stands out for its role in academic debates (LUNDHOLM, 1995; BERNARD, 1995; FUKUI, 2001). In this context, it can be observed that the numbers supplied by accounting on companies’ financial performance are significant variables for evaluation and forecasting models, both for stock prices and returns and for company valuation. It should be stressed that the work by Ohlson (1995) in many respects rescued the role of accounting in financial studies. Such
interest in using the model proposed by Ohlson (1995) can be better understood in the vision of Lo and Lys (2000a, p. 339), who point to five possible reasons for this interest:

**TABLE 1**

<table>
<thead>
<tr>
<th>Possible Reasons</th>
<th>Justifications</th>
<th>Comments and Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Ohlson model offers a formal connection between valuation and accounting numbers.</td>
<td>Lundholm (1995, p. 761) comments that Ohlson offers a descriptive representation of accounting and the company valuation process.</td>
</tr>
<tr>
<td>2</td>
<td>Researchers appreciate the model’s versatility.</td>
<td>Frankel and Lee (1996) argue that the model for valuation by residual earnings should be an integral part of a complete solution to the problem of accounting diversity and stress that empirical tests illustrate the model’s strength in the differences existing in international accounting.</td>
</tr>
<tr>
<td>3</td>
<td>The Ohlson model (OM) rebuts the affirmation of Lev (1989) that the traditional approaches used in accounting studies encounter a very weak relation (low $R^2$) between market value changes and accounting information.</td>
<td>Analyses demonstrate that the ALR offers an efficient base to estimate the variation in market prices (FRANKEL and LEE, 1996, p. 2).</td>
</tr>
<tr>
<td>4</td>
<td>The high $R^2$ found in empirical studies that apply to the OM lead to the conclusion that the variable “other information” has little relevance in valuation. “Other information” is defined as all the variables that are not captured by the net earnings, book value (BV) and dividends.</td>
<td>Hand and Landsman (1998, p. 24) argue that the role of information not captured by accounting reports must be more limited than previously imagined.</td>
</tr>
<tr>
<td>5</td>
<td>The high explanatory power of the OM model leads some researchers to conclude that this approach can be used for accounting policy recommendations.</td>
<td>The OM has been stimulating a growing body of work examining the connection between a company’s market value and amounts recognized or disclosed in accounting statements. The Coopers &amp; Lybrand Accounting Advisory Committee states that empirical studies evaluating the standards issued for financial disclosure are better guided by Ohlson’s standard (HAND; LANDSMAN, 1998, p. 2).</td>
</tr>
</tbody>
</table>

Source: Adapted from Cupertino (2003, p.15-16)

It should be noted that the methodology proposed by Ohlson (1995), besides offering a descriptive representation of accounting and the company valuation process, is currently stimulating a growing body of work examining the connection between a company’s market value and the amounts recognized or disclosed in financial statements.
2.2.1 Ohlson Model – Initial Concepts

The model proposed by Ohlson (1995) is structured on a set of underlying concepts, and comprehension of this model goes beyond the procedure of going from one mathematical formula to another (LUNDHOLM, 1995).

Studies of the relevance of accounting information and the Ohlson model have a special place in value relevance studies, for attracting great interest among researchers for works of this nature (BEGLEY; FELTHAM, 2000). This interest is justified by the fact that Ohlson (1995) used two accounting variables in his valuation model: (i) book value (BV), taken from the balance sheet; and (ii) net earnings (E), taken from the income statement.

Considering the existing theory, Ohlson (1995) structured a valuation model sustained by the clean surplus relation (CSR), in which accounting variables have an essential role. Ohlson’s proposal is based on valuation by the residual profit, in which the company’s value represents the sum of the book value plus the present value of future residual profits.

Specifically, this model rests on three premises:

(i) The DDM (discounted dividend model) determines the market value, under risk neutrality;
(ii) Traditional accounting applies that satisfies the clean surplus relation CSR;
(iii) Inclusion of the stochastic behavior of \( x^a_t \) (abnormal earnings).

While the first premise considers the discounted present value of future dividends together with the property of dividend irrelevance to define the share price, the second assures consistent earnings determination, regardless of the accounting system employed. The third premise, for both Ohlson (1995) and Lundholm (1995), asserts that the empirical implications critically depend on the informational dynamics of residual earnings.

Its function is to place restrictions on the standard discounted dividend model. From an empirical perspective, the firm continues being valued by the DDM, with the difference of establishing the nature of the relation between current information and the discounted value of future dividends. The stochastic process that defines the third premise is known as linear information dynamics (LID).

The points addressed here constitute the conceptual base on which the OM provides guidance on how to obtain the variables and parameters needed in the theoretical framework of the Ohlson model.

2.2.2 The valuation model used in the study

In order to analyze the explanatory power of the accounting variables and test the hypotheses raised here, this study is based on the theory of accounting information and capital market. This study seeks to analyze accounting variables such as: earnings, net equity and deferred charges and whether their explanatory power is significant.

To test this assertion, we use the modeling proposed by Collins et al. (1997), which is based directly on Ohlson’s model. However, this contribution of accounting to explain current market prices can be evaluated by the following specification:

\[
P_{iAj} = \omega_0 + \omega_1E_{ij} + \omega_2BV_{ij} + \varepsilon_i
\]

Where:

- \( P_{iAj} \) = Share price of company \( i \) four months after the end of fiscal year \( j \) (April in Brazil, where the fiscal and calendar year coincide).
The Relevance of Accounting Information in the Process of Valuation of Companies

**BV**\(_{ij}\) = Book value per share of company \(i\) at the end of year \(j\).

**E**\(_{ij}\) = Net earnings per share of company \(i\) at the end of year \(j\).

\(\varepsilon_i\) = Error term of the regression.

In this form, we have the following regression for 1995:

\[
P_{iA96} = 9500 + 9501E_{ij} + 9502BV_{ij} + \varepsilon_{i95}
\]

From the model proposed by Collins *et al.* (1997), the regression was repeated for the years between 1995 and 2003, using as independent variables the earnings per share, book value per share and deferred charges per share, to verify the influence of these items.

Specifically, we formulated the following hypotheses to verify the explanatory power of earnings, net equity and deferred charges.

\(H_0 (i)\): The current share prices of companies in the new economy can be explained by accounting variables (earnings and equity) with statistically significant coefficients.

\(H_0 (ii)\): The current share prices of companies in the new economy can be explained by accounting variables (earnings and equity and deferred charges) with statistically significant coefficients.

We made some adaptations to the formulation proposed by Collins *et al.* (1997), seeking to verify the explanatory power of deferred charges and its incremental power in relation to that of net equity vis-à-vis current share prices.

To test these hypotheses, the following models are used: Hypothesis

(i): \(P_{iA96} = 9500 + 9501E_{ij} + 9502BV_{ij} + \varepsilon_{i95}\)

Hypothesis (ii): \(P_{iA96} = 9500 + 9501E_{ij} + 9502(BV_{ij} - DCH_{ij}) + 9503DCH_{ij} + \varepsilon_{i95}\)

Where:

- \(P_{iA96}\) = The share price of company \(i\) four months after the end of fiscal year \(j\).
- \(BV_{ij}\) = Book value per share of company \(i\) at the end of year \(j\).
- \(DCH_{ij}\) = Deferred charges per share of company \(i\) at the end of year \(j\).
- \(E_{ij}\) = Net earnings per share of company \(i\) at the end of year \(j\).
- \(\varepsilon_{ij}\) = Error term of the regression

In this context, this study attempts to analyze Brazilian telecommunications companies (high concentration of intangibles); steel and metals companies (low concentration of intangibles) and banks and insurance companies, these last for comparison.

**III. METHODOLOGY AND SOURCE OF DATA**

The methodology used in constructing the study can be understood from three methodological orientations, regarding the objectives, procedures and approach to the problem.

Regarding the **objectives**, the study can be classified as exploratory. According to Beuren (2003, p. 80), studies of an exploratory nature seek “[…] to investigate the subject in greater depth, to make it clearer […]” and “[…] to explore a subject means to gather more knowledge […]”, as well as to seek new dimensions as yet unknown.” So, an exploratory study is a way to shed light on new concepts and tries to deal with a subject that is as yet little examined in the literature.

Among the **procedures** utilized here, the bibliographical and empirical approaches
Rezende stand out. Cervo and Bervian (1983, p.49-57) teach that a bibliographical study:

[...] explains a problem based on theoretical references published in documents. It can be conducted independently or as part of a descriptive or experimental study. Both cases seek to learn and analyze the past cultural or scientific contributions on a determined subject, theme or problem.

The empirical approach, according to Martins (1992, p.26), involves “[...] the collection, treatment and analysis of largely quantitative data.”

Regarding the approach to the problem, the work can be classified as quantitative and qualitative. For Beuren (2003, p. 92), qualitative research involves more profound analyses in relation to the phenomenon under study.

3.1 Statistical techniques and analyses

The study has two phases, both of which employ the multivariate technique of “multiple regression.” The first phase’s objective was to investigate the explanatory power of net earnings and equity (book value) in relation to stock price behavior. In the next phase, the extra explanatory power of deferred charges was analyzed, and whether this variable is statistically significant in the valuation model.

The data were taken from the database of Economática, for the period from 1995 to 2003.

3.2 Selecting the variables

Variable selection was initially based on the consideration that the current accounting rules permit capitalizing deferred charges (intangibles). Among the arguments put forward we can mention studies that show that booking investments (deferred) can assist in the process of appraising the relevance of accounting (AMIR; LEV, 1996; LOPES, 2001).

In specific terms, with the intent of analyzing the model’s efficiency, we carried out two analyses. The first only used the earnings per share (EPS) and net equity (book value) per share (BVPS), while the second used the EPS, the BVPS less the amount of deferred charges per share (DCPS), and the amount of the deferred charges per share alone. Hence, we eliminated the highly correlated variables, seeking the best combination of independent variables, and then proceeded to estimate the coefficients of the regression model.

3.3 Analysis of the data

We ran two simulations for each sector, producing two models, the differences being: Model-1 considered only EPS and BVPS, while Model-2 also used DCPS.

Before starting the modeling process, we visually inspected a matrix of correlation between the variables, and the pairs of variables that were highly correlated were noted. It is not desirable to have a high correlation between the independent variables, since a regression model is sensitive to collinearity between them (HAIR et al., 1998). The inclusion of highly correlated variables can cause extremely exaggerated estimates of the regression coefficients (HOSMER; LEMESHOW, 1989).

When there is a strong relation between the independent (explanatory) variables, this relationship is called multicolinearity. In this study, the solution found was to eliminate the offending variable from the model. Specifically, the variable (BVPS Minus Deferred Charges
Regarding the requirements for multivariate analysis, in constructing the multiple regression model we satisfied these for normality\textsuperscript{ii} (the data must be normally distributed), using the Kolmogorov Smirnov (KS) test. We used the ANOVA test for analysis of homoskedasticity\textsuperscript{iii}, finding that the deferred charge variables in the period from 1998 to 2003 for telecommunications companies and in 1999 and 2000 for steel companies were heteroskedastic. Based on this, we transformed the respective variables ($1 / \text{deferred assets per share}$).

Therefore, to estimate the multiple regression model’s coefficients we used the net earnings, book value and amount of deferred charges, with the dependent variable ($Y$) indicating the average price per share for each company in April following the end of the fiscal year. The independent variables ($X$) chosen were net earnings per share and net equity (book value) per share minus deferred charges per share.

IV. RESULTOS DE LA ESTUDIO

Based on the observations and results presented, both in the literature and the empirical analyses on the accounting and financial reality, some expectations can be constructed about the results found. It is important to stress that the results and expectations presented here are the fruit of reflection on the relationship between current stock prices and the accounting numbers of the Brazilian firms analyzed.

4.1 Analysis of the value relevance of earnings and book value

We analyzed the value-relevance of earnings and book value for companies in the three sectors chosen, telecommunications (to represent the new economy) and steel/metal and banks/insurers (old sector) to establish a comparison.

From this, our regression model was:

$$P_{iA96} = 95\omega_0 + 95\omega_1E + 95\omega_2BV_{ij} + \varepsilon_{i95}$$

<table>
<thead>
<tr>
<th>TABLE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telecommunications Sector</td>
</tr>
<tr>
<td>Regressions – Earnings and Net Equity</td>
</tr>
<tr>
<td>Sector</td>
</tr>
<tr>
<td>Telecommunications</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
The regressions projected for the telecommunications sector demonstrated that the accounting figures (earnings and book value) had significant explanatory power to explain the behavior of the companies’ stock prices. These results corroborate the conclusions of Lopes (2001). Nevertheless, for 1996 and 1997 the results, both of the coefficients and $R^2$, did not have significant values, remembering that in 2001, 2002 and 2003, the variable EPS (earnings per share) was excluded from the model for being highly correlated with the other variables (HAIR et al., 1998).

The results for the steel and metals and banks and insurers sectors are expressive in relation to the coefficients and $R^2$ (adjusted) in the periods analyzed, as shown in Table 3 below.

To analyze the former sector, we used the following regression model:

$$ P_{IA96} = \beta_0 + \beta_1 E + \beta_2 BV_{ij} + \epsilon $$

TABLE 3  
Steel and Metals Sector.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number of firms</th>
<th>Year</th>
<th>Result</th>
<th>$\beta_0$</th>
<th>$\beta_1$</th>
<th>$\beta_2$</th>
<th>$R^2$</th>
<th>Durbin – Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel/Metals</td>
<td>38</td>
<td>1995</td>
<td>Coef</td>
<td>0.892</td>
<td>-1.286</td>
<td>-0.189</td>
<td>0.988</td>
<td>1.724</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p-value</td>
<td>0.060</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>1996</td>
<td>Coef</td>
<td>1.284</td>
<td>-2.331</td>
<td>-0.373</td>
<td>0.887</td>
<td>2.064</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p-value</td>
<td>0.197</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>1997</td>
<td>Coef</td>
<td>1.255</td>
<td>-0.681</td>
<td>-0.241</td>
<td>0.742</td>
<td>2.037</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p-value</td>
<td>0.181</td>
<td>0.000</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>1998</td>
<td>Coef</td>
<td>0.913</td>
<td>0.000</td>
<td>-0.007</td>
<td>0.539</td>
<td>2.024</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p-value</td>
<td>0.114</td>
<td>0.355</td>
<td>0.077</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>1999</td>
<td>Coef</td>
<td>0.687</td>
<td>-0.637</td>
<td>0.332</td>
<td>0.415</td>
<td>1.964</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p-value</td>
<td>0.110</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>2000</td>
<td>Coef</td>
<td>1.29</td>
<td>-0.945</td>
<td>0.311</td>
<td>0.879</td>
<td>1.944</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p-value</td>
<td>0.015</td>
<td>0.000</td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>2001</td>
<td>Coef</td>
<td>0.571</td>
<td>2.756</td>
<td>0.109</td>
<td>0.84</td>
<td>1.464</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p-value</td>
<td>0.064</td>
<td>0.000</td>
<td>0.008</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>39</td>
<td>2002</td>
<td>Coef</td>
<td>3.601</td>
<td>0.861</td>
<td>-0.103</td>
<td>0.01</td>
<td>1.504</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p-value</td>
<td>0.000</td>
<td>0.134</td>
<td>0.138</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>2003</td>
<td>Coef</td>
<td>1.730</td>
<td>4.940</td>
<td>-0.003</td>
<td>0.795</td>
<td>1.908</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>p-value</td>
<td>0.105</td>
<td>0.000</td>
<td>0.850</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Unlike the results for the telecommunications sector, from the accounting numbers for the steel and metals sector, only in 2002 did the coefficients not show significant values.

The results for $R^2$ in the sector with the lowest concentration of permanent assets (assets subject to indexing, defined in BR-GAAP as: fixed assets, fixed investments and...
deferred charges), banks and insurance companies, were highly significant in relation to the other sectors analyzed, as can be seen in Table 4 below.

We used the following regression model for this last sector:

$$P_{tA96} = \beta_0 + \beta_1 E + \beta_2 (BV_{ij} - DCH_{ij}) + \beta_3 DCH_{ij} + \epsilon_{i95}$$

### TABLE 4
**Financial and Insurance Sector**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number of firms</th>
<th>Year</th>
<th>Result</th>
<th>$\beta_0$</th>
<th>$\beta_1$</th>
<th>$\beta_2$</th>
<th>$\beta_3$</th>
<th>$R^2$</th>
<th>Durbin – Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1995</td>
<td>Coef</td>
<td>-0.178</td>
<td>0.362</td>
<td>0.688</td>
<td>0.986</td>
<td>3.164</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p$-value</td>
<td>0.358</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1996</td>
<td>Coef</td>
<td>-0.368</td>
<td>0.00844</td>
<td>0.776</td>
<td>0.936</td>
<td>1.89</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p$-value</td>
<td>0.401</td>
<td>0.53</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1997</td>
<td>Coef</td>
<td>-0.531</td>
<td>-0.738</td>
<td>1.042</td>
<td>0.835</td>
<td>1.634</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p$-value</td>
<td>0.468</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1998</td>
<td>Coef</td>
<td>-0.643</td>
<td>-0.945</td>
<td>0.951</td>
<td>0.876</td>
<td>1.428</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p$-value</td>
<td>0.251</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1999</td>
<td>Coef</td>
<td>-0.381</td>
<td>10.751</td>
<td>-0.361</td>
<td>0.972</td>
<td>3.058</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p$-value</td>
<td>0.419</td>
<td>0.000</td>
<td>0.416</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2000</td>
<td>Coef</td>
<td>0.00202</td>
<td>8.584</td>
<td>-0.178</td>
<td>0.996</td>
<td>3.083</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p$-value</td>
<td>0.963</td>
<td>0</td>
<td>0.434</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2001</td>
<td>Coef</td>
<td>-0.676</td>
<td>5.627</td>
<td>0.305</td>
<td>0.988</td>
<td>2.822</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p$-value</td>
<td>0.258</td>
<td>0.000</td>
<td>0.224</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2002</td>
<td>Coef</td>
<td>-6.16</td>
<td>2.16</td>
<td>0.932</td>
<td>0.87</td>
<td>3.174</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p$-value</td>
<td>0.258</td>
<td>0.522</td>
<td>0.146</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2003</td>
<td>Coef</td>
<td>6.643</td>
<td>1.021</td>
<td>1.119</td>
<td>0.989</td>
<td>3.002</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p$-value</td>
<td>0.283</td>
<td>0.395</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the three sectors analyzed, (BV) turned out to be significant in the majority of the years.

**4.2 Analysis of the effect of deferred charges on the value-relevance of earnings and book value**

We analyzed intangibles by applying the model proposed by Collins et al. (1997) with some adjustments. The objective was to investigate the incremental explanatory power of deferred charges on the value-relevance of earnings and book value. For these analyses, we employed the following regression model:

$$P_{tA96} = \beta_0 + \beta_1 E + \beta_2 (BV_{ij} - DCH_{ij}) + \beta_3 DCH_{ij} + \epsilon_{i95}$$

### TABLE 5
**Telecommunications Sector**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Number of firms</th>
<th>Year</th>
<th>Result</th>
<th>$\beta_0$</th>
<th>$\beta_1$</th>
<th>$\beta_2$</th>
<th>$\beta_3$</th>
<th>$R^2$</th>
<th>Durbin – Watson</th>
</tr>
</thead>
</table>

The results from analyzing intangibles (deferred charges) showed low explanatory power. Only in 1996 was the coefficient statistically significant, at the 95% level, as can be seen in Table 5.

The analyses of the Steel and Metals and Banks and Insurers sectors were only for comparison.

<table>
<thead>
<tr>
<th>Year</th>
<th>Coef</th>
<th>p-value</th>
<th>Result</th>
<th>R²</th>
<th>Durbin – Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>1.054</td>
<td>0.000</td>
<td>7.002 E-06</td>
<td>9.994 E-08</td>
<td>0.517</td>
</tr>
<tr>
<td>1996</td>
<td>1.204</td>
<td>0.940</td>
<td>808.660</td>
<td>0.014</td>
<td>0.259</td>
</tr>
<tr>
<td>1997</td>
<td>21.979</td>
<td>0.054</td>
<td>439.208</td>
<td>0.741</td>
<td>0.034</td>
</tr>
<tr>
<td>1998</td>
<td>11.747</td>
<td>0.000</td>
<td>-4.364</td>
<td>0.799</td>
<td>-7.23E-07</td>
</tr>
<tr>
<td>1999</td>
<td>29.904</td>
<td>0.000</td>
<td>-6.505</td>
<td>1.586</td>
<td>-0.000212</td>
</tr>
<tr>
<td>2000</td>
<td>44.407</td>
<td>0.000</td>
<td>-28.839</td>
<td>5.511</td>
<td>-0.051</td>
</tr>
<tr>
<td>2001</td>
<td>28.02</td>
<td>0.001</td>
<td>7.458</td>
<td>0.000</td>
<td>0.155</td>
</tr>
<tr>
<td>2002</td>
<td>13.561</td>
<td>0.000</td>
<td>1.443</td>
<td>-0.00006</td>
<td>0.897</td>
</tr>
<tr>
<td>2003</td>
<td>9.003</td>
<td>0.148</td>
<td>6.826</td>
<td>0.000</td>
<td>0.475</td>
</tr>
</tbody>
</table>

### TABLE 6
Steel and Metals Sector

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of firms</th>
<th>Year</th>
<th>Result</th>
<th>Coef</th>
<th>p-value</th>
<th>∑y</th>
<th>∑yxy</th>
<th>R²</th>
<th>Durbin – Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel and Metals</td>
<td>384</td>
<td>1995</td>
<td></td>
<td>0.995</td>
<td>0.067</td>
<td>-1.285</td>
<td>-0.000</td>
<td>0.801</td>
<td>0.634</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>1996</td>
<td></td>
<td>1.366</td>
<td>0.192</td>
<td>-2.331</td>
<td>-0.000</td>
<td>0.000</td>
<td>0.760</td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>1997</td>
<td></td>
<td>1.035</td>
<td>0.28</td>
<td>-0.69</td>
<td>-0.000</td>
<td>0.000</td>
<td>0.328</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>1998</td>
<td></td>
<td>1.116</td>
<td>0.060</td>
<td>-0.042</td>
<td>-0.000</td>
<td>0.000</td>
<td>0.998</td>
</tr>
<tr>
<td></td>
<td>48</td>
<td>1999</td>
<td></td>
<td>0.714</td>
<td>0.011</td>
<td>-0.412</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>2000</td>
<td></td>
<td>1.544</td>
<td>0.011</td>
<td>-0.918</td>
<td>0.299</td>
<td>-8E-05</td>
<td>0.878</td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>2001</td>
<td></td>
<td>0.518</td>
<td>0.093</td>
<td>2.7</td>
<td>0.0098</td>
<td>3.725</td>
<td>0.842</td>
</tr>
<tr>
<td></td>
<td>39</td>
<td>2002</td>
<td></td>
<td>2.417</td>
<td>0.004</td>
<td>1.074</td>
<td>-0.130</td>
<td>25.391</td>
<td>0.324</td>
</tr>
<tr>
<td></td>
<td>41</td>
<td>2003</td>
<td></td>
<td>1.148</td>
<td>0.236</td>
<td>3.787</td>
<td>0.00012</td>
<td>27.6</td>
<td>0.836</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of firms</th>
<th>Year</th>
<th>Result</th>
<th>Coef</th>
<th>p-value</th>
<th>∑y</th>
<th>∑yxy</th>
<th>R²</th>
<th>Durbin – Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks and Insurers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rezende**

The Relevance of Accounting Information in the Process of Valuation of Companies

In the years analyzed (1995 to 2003), for the steel and metals sector deferred charges only produced statistically significant coefficients for 1999, 2002 and 2003.

For banks and insurers, deferred charges had low explanatory power in relation to earnings and book value. More specifically, we found that when deferred charges are detached (subtracted) from the book value and included in the model alone, there is an inverse effect, in other words, the model’s explanatory power decreases. Both the earnings and book value of the firms considered were statistically significant.

V. CONCLUSIONS

The accounting numbers of companies in the new economy, specifically telecommunications companies, are also a good proxy to study the stock price of these companies. This is in agreement with the conclusions of Lopes (2001), and apparently conflicts with the results reported by Lev and Amir (1996), who found that accounting figures did not have significant explanatory power for companies with high concentrations of intangibles.

Nevertheless, the deferred charges booked according to current accounting principles showed low explanatory power for all three sectors analyzed. Deferred charges actually had an inverse effect, reducing the model’s explanatory power.

Specifically, the hypotheses posed cannot be rejected a priori without further investigations.

For banks and insurers, deferred charges had low explanatory power in relation to earnings and book value. More specifically, we found that when deferred charges are detached (subtracted) from the book value and included in the model alone, there is an inverse effect, in other words, the model’s explanatory power decreases. Both the earnings and book value of the firms considered were statistically significant.

V. CONCLUSIONS

The accounting numbers of companies in the new economy, specifically telecommunications companies, are also a good proxy to study the stock price of these companies. This is in agreement with the conclusions of Lopes (2001), and apparently conflicts with the results reported by Lev and Amir (1996), who found that accounting figures did not have significant explanatory power for companies with high concentrations of intangibles.

Nevertheless, the deferred charges booked according to current accounting principles showed low explanatory power for all three sectors analyzed. Deferred charges actually had an inverse effect, reducing the model’s explanatory power.

Specifically, the hypotheses posed cannot be rejected a priori without further investigations.

For banks and insurers, deferred charges had low explanatory power in relation to earnings and book value. More specifically, we found that when deferred charges are detached (subtracted) from the book value and included in the model alone, there is an inverse effect, in other words, the model’s explanatory power decreases. Both the earnings and book value of the firms considered were statistically significant.
rejected or accepted a priori. In this context, more investigation is necessary to make greater inferences about the explanatory power of intangibles.

Consequently, the investments in deferred charges represent small values in relation to the book value of companies. This fact is a possible explanation for the low coefficients presented by the regression models.

In the periods analyzed, both the companies’ earnings and book value were statistically significant. The R^2 used as a metric in the analyses showed that the amounts analyzed have significant values for the three sectors. Thus the study, using the multiple regression technique, showed it is possible to analyze the value-relevance of accounting variables.

In this study, there are various factors that can be treated as limitations, among them the interpretation of the coefficients of the variables presented by the models, with some of the variables having coefficients with low values and others with very high coefficients, which hinders choosing the most relevant variables. We stress that even though some coefficients had values near zero, or very high, this does not invalidate the model’s explanatory power, it only makes interpretation more difficult (HAIR et al., 1998).

REFERENCES


LUNDHOLM, R.; O’KEEFE, T. Reconciling value estimates from the discounted cash flow model and the residual income model. Contemporary Accounting Research, v. 18 (Summer), 2001a, p. 311-35.


---

1 BR-GAAP stands for “generally accepted accounting principles in Brazil”.

2 In order to verify the requirement for normality of data, we used the Kolmogorov Smirnov test and found that among the years analyzed there was a need to adjust the sample only in 1995 for the telecommunications sector. The sample variables were corrected by the transformation \( \frac{1}{BV}; \frac{1}{E}; \frac{1}{DCH} \); and the price variable, \( P \), was raised to the second power). Hence, in the three sectors analyzed the samples satisfied the requirement of being normally distributed at the 95% level of significance.

3 The homoskedasticity requirement is that the variance of the residuals must be constant.

4 In view of the requirement for normally distributed data in 1995, we used the following modeling: \( (P_{1996})^2 = 95_0 + 95_1 \frac{1}{E} + 95_2 \frac{1}{BV_{ij}} + \epsilon_{1995} \)

5 In view of the requirement for normally distributed data in 1995, we used the following modeling: \( (P_{1996})^2 = 95_0 + 95_1 \frac{1}{E} + 95_2 \frac{1}{(BV_{ij} - DCH_{ij})} + 95_3 \frac{1}{DCH_{ij}} + \epsilon_{1995} \)