The Relevance of Deferred Charges and Goodwill in the Valuation of Brazilian Companies

Eliseu Martins
Professor – University of São Paulo, Brazil
Av. Professor Luciano Gualberto, 908 – FEA3 – São Paulo, Brazil – 05508-900
emartins@usp.br

Amaury José Rezende
Assistant Professor – University of São Paulo – Ribeirão Preto, Brazil
PhD Student – University of São Paulo, Brazil
Av. Bandeirantes, 3900 – Monte Alegre – Ribeirão Preto, SP, Brazil – 14040-900
amauryj@usp.br ou amauryjr@fearp.usp.br

Flávia Zóboli Dalmácio
Assistant Professor – FUCAPE Business School
PhD Student – University of São Paulo, Brazil
Av. Fernando Ferrari, 1358 – Goiabeiras – Vitória, ES, Brazil – 29075-010
flavia@fucape.br ou flaviazd@usp.br

Andson Braga de Aguiar
PhD Student – University of São Paulo, Brazil
Av. Professor Luciano Gualberto, 908 – FEA3 – São Paulo, Brazil – 05508-900
andsonbraga@yahoo.com.br

April, 2008
The Relevance of Deferred Charges and Goodwill in the Valuation of Brazilian Companies

Abstract

The objectives of this work are: (1) to analyze the relevance of accounting variables to explain the behavior of the share prices of Brazilian companies traded on the São Paulo Stock Exchange (Bovespa); (2) to propose a model to calculate goodwill; and (3) to check the incremental explanatory power of deferred charges and goodwill, where the share price is a function of earnings, book value of equity, deferred charges and goodwill. International studies on intangible capital and goodwill indicate that the accounting information prepared, according to American rules and standards, specifically for companies in the so-called new economy, does not have predictive power to evaluate the behavior of companies’ share prices. Since in Brazil the accounting rules allow registering expenditures on research and development (R&D), specifically deferred charges of an intangible nature, we sought to evaluate whether the Brazilian accounting model, because it contemplates aspects particular to the “recognition” of these items, has incremental power in the valuation of the share prices of Brazilian companies. We used the panel data technique and according to the results, found that the current prices of Brazilian companies’ shares can be explained by accounting variables (earnings, book value, deferred charges) and by goodwill, with statistically significant coefficients.

1 Introduction

The relevance of accounting information has been studied for decades by researchers. In these studies, accounting variables (earnings, book value) are used as proxies to try to explain the behavior of share prices. Therefore, the motivation of this work is to verify the incremental explanatory power of deferred charges and the goodwill created by Brazilian companies, and whether these are statistically significant in explaining the behavior of share prices. This study is part of an ongoing project of studies on the intangible assets and value relevance of accounting information.

In this context, Amir and Lev (1996) examined the relevance of accounting information and nonfinancial information in the wireless communication industry. They asked:

(1) What is the value-relevance of reported financial information of fast-changing, science-based companies? While earnings and book values of such companies are typically depressed due to excessive investment expensing, do they still provide relevant (predictive) information for asset valuation? (2) What is the incremental value-relevance of nonfinancial information (e.g., customer penetration rate of cellular companies) over that of financial information?” and conclude that current accounting procedures are not capable of demonstrating what occurs to companies in this segment, stating that one of the reasons for the weak performance of accounting figures was the fact that US-GAAP do not permit companies to capitalize investments in intangibles under research and development (R&D) expenses.

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

In light of these arguments, this study is aimed at investigating companies in the Brazilian capital market, because Brazilian accounting rules have a certain peculiarity in relation to registering intangibles, permitting capitalization of research and development expenditures.

Rezende and Lopes (2005), in analyzing the value of deferred charges as a proxy to assess the impact of accounting information in the process of valuing companies, found that this rubric has low explanatory power, which runs counter to the arguments of Aboody and Lev (1998), that intangible assets offer relevant information for investors and that research and development spending should be brought back to the financial statements.

Alencar and Dalmácio (2006), in analyzing deferred charges, under the perspective of relevance among economic sectors, level of liquidity and class (common and preferred) of the shares of Brazilian companies, indicate that deferred charges have significant relationships both among sectors and regarding the liquidity and class of shares.

The variability of the relevance of deferred charges in the Brazilian scenario can be related to the fact that Brazilian accountancy is influenced by corporate and tax legislation, which impose specific rules on the treatment of the respective spending on research and development.
Regarding the accounting treatment of expenditures on research and development, Brazilian legislation allows two accounting treatments: as deferred charges, amortized over five to ten years, according to corporate legislation, or as a current expense, according to tax legislation. This dual treatment provides maneuvering room to managers, enabling earnings management and generating tax savings for the company.

Based on the above, the questions investigated here are: What is the relevance of accounting variables to explain the share price behavior of Brazilian companies listed on the Bovespa? And what is the incremental explanatory power of deferred charges and goodwill?

Therefore, in this study we sought: (1) to analyze the relevance of accounting variables to explain the share price behavior of companies listed on the Bovespa; (2) to propose a model to calculate goodwill; and (3) to verify the incremental explanatory power of deferred charges and goodwill, in which the share price is a function of earnings, book value, deferred charges and goodwill.

To evaluate the explanatory power of the variables, we used the conceptual framework proposed by Ohlson (1995), which expresses prices as a function of earnings and book value, together with accounting variables (deferred charges) and other information, such as goodwill.

The relevance of this work rests in verifying the importance of the recognition and accounting of deferred charges and goodwill in the process of appraising company values by stakeholders, emphasizing the limitations imposed by corporate and tax legislation in the accounting treatment of these items.

The article is divided into six sections. The first includes this introduction; the second discusses the relevance of accounting information; the third addresses the conceptual aspects of goodwill; the fourth explains the methodological aspects; the fifth demonstrates the results obtained; and the last presents the conclusions. To summarize, this study investigates the relevance of accounting variables (earnings, book value and deferred charges), associated with goodwill as a proxy.

2 The Relevance of Accounting Information and the Capital Market

The role of accounting for the capital market has been growing, principally shown by the volume of studies on the theme. A large part of these studies seek evidence of the importance of accounting information to the financial market.

The seminal work on the role of accounting information on the capital market was Ball and Brown (1968). The authors investigated the existence of a relationship between accounting income and share price and found that accounting numbers provide useful information to the capital market. Beaver (1968) verified that the price and trading volume of stocks in weeks near the disclosure of financial figures react strongly to accounting information. Beaver, Clarke and Wright (1979), based on the work of Ball and Brown (1968), found a positive correlation between variations in the accounting income and share prices.

Mention should also be made of the research on the long-term behavior of earnings and returns carried out by Board and Walker (1990) and Strong and Walker (1989). The latter study, inspired by the work of Lev (1989), investigated accounting income and its importance to investors. The authors concluded that the R² (adjusted) is a measure that can help discover the degree of utility of accounting income and the predictability of the variation in returns and argued that income is of modest utility, explaining only 5% of the variation in the rate of return. They stressed that the weak explanatory power of the variables was caused by the accounting practices followed.

Watts and Zimmerman (1986, cited in Lopes, 2002, p. 1) affirm that “financial accounting and capital markets research has become one of the most useful in international accounting academics. From the works cited, others were developed, mainly in the United States and England, countries that have highly developed capital markets. According to Lopes (2001, p. 111),

These two markets have similar governance models (in general) where accounting is not highly regulated and is mainly aimed at capital market investors (BALL et al., 2000). Therefore, the above results are not surprising since the main users of accounting in these two countries are investors. Nevertheless, studies carried out in emerging or less developed markets are nearly nonexistent, especially regarding Latin America.

In Brazil, the work of Lopes (2001) should be mentioned. Using the model developed by Ohlson (1995), the author found evidence that accounting information is relevant in emerging markets, such as Brazil. However, the relevance of book value (stockholders’ equity) is greater than that of earnings (the opposite of that observed in more developed markets.
According to Iudícibus and Lopes (2004, pp. 134-5), studies of 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 relationship between the return on shares and accounting numbers; and the relevance of financial information in comparison with nonfinancial information.

2.1 Investments in Intangible Assets and their Effects on the Value Relevance of Book Value

Regarding the study of the relevance of the information produced by financial accounting for companies with a high concentration of intangible assets, Lev (1997) and Amir and Lev (1996) argue that this information is limited for companies in the technology and services sector (telecommunications and high technology), which invest significant amounts in intangibles, such as research and development, human capital and brand development.

In this context, Lev (1997) highlights that American financial accounting is limited to recording intangible assets only in certain circumstances, such as acquired intangibles. This limits the usefulness of accounting information to analyze companies that have large amounts of unregistered intangibles. Other findings, reported in the research of Amir and Lev (1996), demonstrate that earnings, book value and cash flow are irrelevant to determine the value of cellular operators, companies characterized by having a high concentration of intangible assets.

In this context, Collins et al. (1997, pp. 42-3) point out that “A priori, we have no prediction of how the accounting treatment of intangibles might affect the relative importance of earnings and book value over time.”

Amir, Lev and Sougiannis (1999) report that the forecasts of analysts are more consistent for companies with a high concentration of intangible assets. They observe that the financial numbers of American companies with high concentrations of intangible assets are not as relevant as analysts’ predictions.

The explanation for these facts is that American accounting standards (US-GAAP) do not permit registering research and development or similar expenses.

Corroborating this argument, Amir, Lev and Sougiannis (1999) say that the greater the percentage of capital with research and development is, the lower the R² (adjusted) is in the regressions.

Moreover, Lev and Zarowin (1999) argue that the lack of an increment in intangible assets in the financial statements is partly responsible for the decline (loss) of relevance of accounting figures, both in the valuation of current share prices and the forecast returns.

The study conducted by Aboody and Lev (1998) concluded that the booking of intangible assets summarizes and offers relevant information to investors in general. The authors indicate that intangibles, such as spending on research and development, should be brought back to the financial statements. Besides this, they present evidence that the non-capitalization of intangible assets is associated with large errors in analysts’ earnings forecasts.

Besides the statistical evidence found in relation to 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 state that the lack of disclosure of information on companies' intangible capital is a failing or inefficiency of the market.

In Brazil specifically, Lopes (2001), in studying a sample of companies in 1998 and 1999, found that the accounting numbers of companies of the new economy have greater explanatory power than the numbers of those in the old economy. Consequently, he says that this evidence, found in the Brazilian market, runs counter to the results indicated by Lev (1989). Lopes (2001) stresses that this superiority deserves further investigation, and possibly can be explained by the fact that BR-GAAP permit capitalizing R&D spending and amortizing it over 5 to 10 years.

Once again it is worth referring to the works of Rezende and Lopes (2005) and Alencar and Dalmácio (2006). The difference of the relevance of deferred charges in the Brazilian scenario can be related to the fact that Brazilian accountancy is influenced by corporate and tax legislation, which imposes different rules for treatment of the respective expenditures on research and development.
2.2 Accounting Information and Valuation Models

Accountancy is becoming increasingly important in the process of making forecasts and economic evaluations of companies. Lee (1999) stresses that there is still room for growth of these areas of research, because they offer many opportunities and challenges.

Regarding valuation of companies, the work of Ohlson (1995) stands out, which stressed the role of accounting in financial research and became a center of attention in academic debates (LUNDHOLM, 1995; BERNARD, 1995; FUKUI, 2001). The methodology proposed by Ohlson (1995), besides offering a descriptive representation of accounting and the process of valuing companies, has been stimulating a growing set of studies examining the connection between the market values of companies and the figures recognized or disclosed in financial reports.

In this context, it is observed that the numbers supplied by accountancy on the economic and financial performance of companies are significant variables for models to evaluate and forecast both the prices and returns of shares and the value of companies.

3 Conceptual Aspects and Models for Valuation of Goodwill

Methods to appraise the value of the goodwill produced and acquired by companies and intangible capital have been studied since early in the twentieth century by various authors. Among these are Owens (1923), Yang (1927), Gynther (1969), Martins (1972), Stewart (1998), Edvinsson and Malone, (1998), Hendriksen and Van Breda (1999), Lev (2004).

In this line of discussion, Edvinsson and Malone (1998) point out that assets represent all a company’s property, expressed in monetary value, and are divided into four categories, three of which are objective and measurable and one of which is subjective and not measurable until a company is sold.

The first two asset categories are current assets and fixed assets. By definition, current assets are used or sold in the short run and fixed assets will be used over a longer period, and are subject to depreciation, generating future benefits and serving as physical support for the company’s operational development. The third category consists of investments.

The fourth category of assets is what presents the greatest complexity and creates the most debate, because it covers assets that do not have physical existence, but still represent value to the firm. They are hard to put a value on, except if the company is sold, and are only realized in the long term. These assets are known as intangible assets.

However, this definition according to Martins (1972) is very simplistic, since there are other types of assets that do not have physical form but are not classified as intangible.

According to Hendriksen and Van Breda (1999), intangible assets can be further divided into two groups: the identifiable ones, such as patents, and those not identifiable, of which the most common example is goodwill. According to the authors, there are three specific characteristics that distinguish tangible from intangible assets, namely: inexistence of alternative uses, lack of separability and uncertainty of recovery.

Lev (2004, p. 114) starts from the premise that “the enterprise’s performance, as reflected by operating earnings, is generated by its physical and financial assets, enabled by intangibles.” He goes on to say that “intangible capital is an indicator of any well-run competitive enterprise,” and not just those in “intangibles-intensive” sectors.

Since its first mention, in 1571, according to Manobe (1986), until nowadays, the theme of goodwill has been subject of studies, debates, articles, agreement and disagreement among scholars. Considering the complexity of the theme, below we present some comments in the literature.

Owens (1923) said that one of the oldest definitions of goodwill comes from Lord Elton: “Goodwill is nothing more than the probability that customers will resort to the old place” and adds another definition from a famous American jurist (Chief Justice Story): Goodwill is

the advantage or benefit which is acquired by an establishment beyond the mere value of the capital, stock, funds, or property employed therein, in consequence of the general public patronage and encouragement which it receives from constant and habitual customers on account of its local position or common celebrity, or reputation for skill, or affluence, or punctuality, or from any other accidental circumstances and necessities or even from partialities or prejudices.
According to Gynther (1969), goodwill exists because assets are present, even though they are not listed with the tangible assets. For example, “special skill and knowledge”, “high managerial ability”, “monopolistic situation”, “social and business connections”, “good name and reputation”, “favorable situation”, “excellent staff”, “trade names” and “established clientele” are assets in this category. The sum of the value of these assets (commonly referred to as intangible assets) is the value of goodwill.

Martins (1972, p. 55) affirms that:

Goodwill has been the subject of studies, debates, articles, books, legislation, agreement and disagreement for many years. The citations and references on it date back centuries, but the first condensation of its meaning and the first systematic work focusing on it appears to date from 1891.

According to Manobe (1986, p. 57), goodwill, by its nature, is a value resulting from the expectation of future earnings and the contribution that can be attributed to assets not identified and/or not accounted for by the company, as well as the undervaluation of assets and even lack of measurement methods. It is a residual value attributable, among the factors, to the existence of efficient management, industrial processes and own patents, good location, excellent human resources, effective advertising, privileged financial conditions and degree of synergy. All of these are important factors to a company, but are not contemplated by accountancy because of the difficulty of measuring them.

All these factors can be considered as affecting a company’s results over the long term, but are not considered by accounting.

The Chartered Institute of Management Accountants (CIMA, 1996, p. 87) defines goodwill as the difference between the value of a business as a whole and the sum of its assets evaluated individually by their fair value.

According to Iudícibus (2004, p. 234), “goodwill is nothing more than the extra price paid over the market value of the owners’ equity of acquired enterprises to reflect an expectation of future profits in excess of its opportunity costs.” He observes that in the definitions presented, goodwill is associated with the future earnings and the prospects of these future earnings are associated with a set of factors not contemplated in accounting information, perhaps due to conservatism.

Canning (cited in MARTINS, 1972, p. 63) believes that each asset has a determined economic value, but that this is not always easy to identify. According to him:

Each component of the assets has a certain economic value. But not all the elements, resources, rights and factors that have economic value are easily identifiable. For this reason, goodwill represents the grouped value of these elements, which have only one characteristic in common: the difficulty of individualizing them.

Ohlson (1995) presents the Residual Income Valuation (RIV) model, supplying a theoretical and mathematical instrument to value companies based on accounting information. He conciliates the book value and earnings in his valuation formula and affirms that in the RIV model, the difference between the market value and book value of a company (P – BV) refers to the goodwill, while the difference between the market value and capitalized earnings (P – L/r) refers to the changes in goodwill.

Ohlson and Juettner-Nauroth (2005), in analyzing the expected earnings per share (EPS) and EPS growth as determinants of value, present what they call the Abnormal Earnings Growth (AEG) model, derived from the same mathematical and theoretical structure as the RIV model. However, the authors stress that the abnormal growth of profits justifies only part of a change in goodwill. This new analytical approach of Ohlson and Juettner-Nauroth (2005) enables the inclusion of other factors that contribute to the formation of goodwill produced by companies, not just abnormal future earnings.

Goodwill is considered to be the most important intangible asset in the majority of companies. Nevertheless, its accounting treatment is among the most complex items (HENDRIKSEN and VAN BREDA, 1999, p. 392). The authors point to three main aspects regarding its evaluation: (1) favorable attitudes toward the company; (2) present value of the positive difference between expected future earnings and the return considered
normal on the total investment; and (3) general valuation account – the difference between the overall value of the company and the sum of the net individual values of its tangible and intangible assets.

This process of measuring goodwill and intellectual capital is a theme of great interest among researchers. Among the various instruments that seek to measure companies’ intellectual capital, the following stand out: the difference of the total value of assets versus the flow of future benefits brought to the present value; the difference between the market value and book value; the ratio between the market value and book value; Tobin’s “Q”; Stewart’s model; calculated intangible value; Edvinsson & Malone’s model; Sveiby’s model; and the heuristic model.

The model developed by Stewart (1998, p. 128) follows the logic that the value of intangible assets is equal to the capacity of a firm to outperform a competitor that has similar intangible assets. The chart below gives an example of how this model operates.

<table>
<thead>
<tr>
<th>Step</th>
<th>Calculation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Calculate the earnings before taxes for the past three years. For example:</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>2</td>
<td>Calculate the average of the tangible assets at the end of the past three years, according to the balance sheet. For example:</td>
<td>$15,000,000</td>
</tr>
<tr>
<td>3</td>
<td>Obtain the return on assets by dividing the average pre-tax earnings by the average assets:</td>
<td>$3,000,000 / $15,000,000 = 20%</td>
</tr>
<tr>
<td>4</td>
<td>Obtain the average return on assets in the sector over the same period, by using indexes taken from magazines or information from specialized institutions. We chose 12%.</td>
<td>12%</td>
</tr>
<tr>
<td>5</td>
<td>Calculate the “average return for the sector” by multiplying the average return on assets for the sector by the average of the company’s tangible assets:</td>
<td>$15,000,000 x 12% = $1,800,000</td>
</tr>
<tr>
<td>6</td>
<td>Calculate the amount of additional revenues of the company from these assets in relation to the average for the sector, that is, the “extra return”:</td>
<td>$3,000,000 - $1,800,000 = $1,200,000</td>
</tr>
<tr>
<td>7</td>
<td>Calculate the income tax on the additional value by multiplying the extra return by the average tax rate in the period analyzed:</td>
<td>$1,200,000 x 15% = $180,000</td>
</tr>
<tr>
<td>8</td>
<td>Subtract the income tax from the extra return. This figure represents the premium to be attributed to the intangible assets.</td>
<td>$1,200,000 - $180,000 = $1,020,000</td>
</tr>
<tr>
<td>9</td>
<td>Calculate the net present value of the premium by dividing the premium by an appropriate percentage, for example, the company’s cost of capital. We chose 15%:</td>
<td>$6,800,000 x 0.15 = $1,020,000 / 0.15 = $6,800,000</td>
</tr>
</tbody>
</table>

**Chart 1: Example of the calculation of goodwill.**
**Source:** Stewart, 1998.

Regarding the application of this model, Stewart (1998) points out that the American Internal Revenue Service permits the use of a similar method to calculate intangible assets (see Appeal and Review Memorandum 34 (ARM 34) and Revenue Ruling 68-609).

According to the methodology proposed by Lev (2004, p. 114), to obtain the value of the intangible capital it is necessary to subtract from earnings the average contribution of the physical and financial assets in the company’s sector. The remainder indicates the contribution of intangible assets to the firm’s performance and serves as a basis to value the intangible capital (called intangibles-driven earnings). The intangible capital is then obtained by calculating the present value of the projected flow of intangibles-driven earnings.

**4 Methodology**

This study is exploratory in nature because its “objective is to delve deeper into the subject, to make it clearer”, and because “to explore a subject means to gather more knowledge [...], as well as to seek new dimensions so far unknown.” In other words, exploratory research is a way to analyze and clarify new concepts and aims to deal with a subject still little explored in the literature (BEUREN, 2003, p. 80).

By means of empirical-analytic investigations, we sought: (1) to analyze the relevance of accounting variables to explain the share prices of Brazilian companies traded on the Bovespa; (2) to propose a model to calculate the goodwill of these companies; and (3) to check the incremental explanatory power of deferred
charges and goodwill, where the share price is a function of earnings, book value, deferred charges and goodwill. According to Martins (2000, p. 26), empirical-analytical investigations are approaches that have in common the use of markedly quantitative techniques of collecting, treating and analyzing data. They privilege practical studies. Their proposals have a technical, restoring and incremental character. They are greatly concerned with the causal relation between the variables. The validation of the scientific evidence is sought through tests of the instruments and degrees of significance and systemization of the operational definitions.

4.1 Statistical Techniques and Analyses

In this study we used the panel data technique, in order to investigate the explanatory power of net income and book value in relation to the behavior of the share prices, as well as to verify the incremental explanatory power of deferred charges and goodwill, and whether these variables are statistically significant in the valuation model.

We used the generalized least squares (GLS) method, with weighted cross-sections seeking to correct for the presence of heteroskedasticity, by means of the residual variances of the cross-sections (weighting).

4.2 Selection of the Variables and Sample

We selected the variables initially by considering that the financial accounting rules permit accountancy to record expenditures of a deferred (intangible) nature. Among the arguments presented, we can highlight studies that indicate the booking of investments (deferred) can help evaluate the relevance of accounting (AMIR and LEV, 1996; LOPES, 2001).

More specifically, to analyze the significance of the model, we used the following variables: Earnings per Share (EPS), Book Value per Share (BVPS), Deferred Charges per Share (DEFPS), Goodwill per Share, calculated based on the return on assets (GROA), Variation of Deferred Charges per Share (VARDEF) and the logarithm of Net Revenue (LNREV). We included the Revenue variable in the model, as a control variable, as a proxy for company size.

The sample was drawn from companies with shares traded on the Bovespa.

4.3 Models Utilized

Aiming to analyze the explanatory power of the accounting variables, we based the study on the theory on accounting information and the capital market. We sought to analyze the accounting variables, such as earnings, book value and deferred charges, associated with a proxy for goodwill, and whether their explanatory power is significant. To test this assertion, we used the modeling proposed by Collins et al. (1997), which in turn is based on that of Ohlson (1995). This contribution to accounting, to explain current market prices, can be evaluated by the following specification:

\[ P_{ij} = \omega_0 + \omega_1 E_{ij} + \omega_2 BV_{ij} + \varepsilon_{ij} \]

where:

- \( P_{ij} \) = average share price of company \( i \) in the four months (until April in the Brazilian case) after the end of fiscal year \( j \).
- \( E_{ij} \) = value of net earnings per share of company \( i \) at the end of year \( j \).
- \( BV_{ij} \) = book value per share of company \( i \) at the end of year \( j \).
- \( \varepsilon_{ij} \) = error term of the regression.
Therefore, to check the incremental explanatory power of deferred assets and goodwill, where the share price is a function of net earnings, book value of equity, deferred charges and goodwill, we used the following model:

\[ SP_{ij} = w_0 + w_1 \text{EPS}_{ij} + w_2 \text{BVPSNDEF}_{ij} + w_3 \text{DEFPS}_{ij} + w_4 \text{GROA}_{ij} + w_5 \text{VARDEF}_{ij} + w_6 \text{LNREV}_{ij} + \varepsilon_i \]

where:

- \( SP_{ij} \) = average price per share of company \( i \) in the four months (until April in the Brazilian case) after the end of fiscal year \( j \).
- \( \text{EPS}_{ij} \) = net earnings per share of company \( i \) at the end of year \( j \).
- \( \text{BVPSNDEF}_{ij} \) = book value per share of company \( i \) at the end of year \( j \), net of deferred charges.
- \( \text{DEFPS}_{ij} \) = deferred charges per share of company \( i \) at the end of year \( j \).
- \( \text{GROA}_{ij} \) = goodwill per share (calculated based on return on assets) of company \( i \) at the end of year \( j \).
- \( \text{VARDEF}_{ij} \) = variation in deferred charges per share of company \( i \) in year \( j \).
- \( \text{LNREV}_{ij} \) = logarithm of the net revenue of company \( i \) at the end of year \( j \).
- \( \varepsilon_i \) = error term of the regression.

Starting from the model proposed by Collins et al. (1997), we repeated the regression for the years between 1998 and 2006, using as independent variables the earnings per share, book value of equity per share, value of deferred assets per share, logarithm of the revenue for each company and the goodwill of each company, seeking to discover the influence these items have, particularly on the share price.

The (modified) model proposed here is based on that put forward by Ohlson (1995), as applied by Collins et al (1997). This model contemplates a special derivation to measure and value the potential goodwill created by Brazilian companies.

4.3.1 Model to Value Goodwill

Among the objectives of this study, the development of a model to measure and value goodwill stands out, with the goal of analyzing the effect of this variable, during the 1998-2006 period, on listed Brazilian companies. The model presented below is derived from the concepts and methods of Stewart (1998) and Lev (2004).

The essence of this model was initially developed by NCI Research in Evanston, Illinois (for measurement of total intangible capital), and subsequently incorporated by the American Accounting Association (AAA). However, in this study, we adapted the concept of intangible capital because of the conceptual incompatibilities on the definition of intellectual capital in the national and international literature.

The application of the concepts of intangible capital for Lev (2004) and Stewart (1998) occurs by comparing the company evaluated with its competitors (peers), and the calculations are based only on past information. The proxy for goodwill used in this study is based on the concepts and methods for measuring intangible assets and goodwill of Lev (2004) and Stewart (1998), as follows.

\[ \text{GROA}_{ij} = (R_{ij} - R_s) \times (\frac{\text{LO}_{ij}}{\text{CO}_{ij}}) \]

where:

- \( \text{GROA}_{ij} \) = goodwill per share (calculated based on return on assets) of company \( i \) at the end of year \( j \).
- \( P_{ij} \) = profitability of the average assets of company \( i \) at the end of year \( j \).
- \( P_s \) = average profitability of assets of sector \( s \) at the end of year \( j \).
- \( \text{LO}_{ij} \) = operating income of company \( i \) at the end of year \( j \).
In this study, we used the interbank certificate of deposit rate as the cost of capital, due to the limitations of calculating the companies' actual cost of capital, which according to Nascimento (1998, p. 196), “is the opportunity cost of the investor, because it represents his expectation of return and the parameter he will use to decide between investing his money in the company or in other business opportunities.” The author adds that “the cost of capital is nothing more [...] than the minimum (as a percentage) that the owners need to gain to be satisfied with the risk being incurred.”

Based on the proposed models, we formulated the following null hypothesis: \( H_0: \) The current share prices of Brazilian companies can be explained by accounting variables (earnings, book value, deferred charges) and by goodwill, with statistically significant coefficients.

In this context, this study sought to analyze Brazilian companies with shares listed on the Bovespa. The sample used for the empirical analysis includes Brazilian companies in the database of Economática, for the period from 1998 to 2006.

5 Results of the Data Analysis

The first analysis consisted of verifying the relevance of the accounting variables: earnings per share and book value per share (EPS and BVPS, respectively) to explain the behavior of the share prices of Brazilian companies traded on the Bovespa. In this first analysis we considered 4,026 observations from 20 economic sectors in the Economática database (Table 1).

**Table 1**

\[
SP_{ij} = w_0 + w_1 \text{EPS}_{ij} + w_2 \text{BVPS}_{ij}
\]

<table>
<thead>
<tr>
<th>Variable</th>
<th>W</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>5.1789</td>
<td>0.0000</td>
</tr>
<tr>
<td>EPS</td>
<td>-0.2245</td>
<td>0.0000</td>
</tr>
<tr>
<td>BVPS</td>
<td>0.3293</td>
<td>0.0000</td>
</tr>
<tr>
<td>Cross-sections included</td>
<td>772</td>
<td></td>
</tr>
<tr>
<td>Total observations</td>
<td>4026</td>
<td></td>
</tr>
<tr>
<td>Adjusted ( R^2 )</td>
<td>0.2948</td>
<td></td>
</tr>
<tr>
<td>P-value (F-statistic)</td>
<td>0.0000</td>
<td></td>
</tr>
</tbody>
</table>

*Considering a 0.05 level of significance.

In this analysis, we considered all the economic sectors in a single sample. The results demonstrate that book value per share (BVPS) was more significant than earnings per share (EPS) in the value-relevance process. These results are similar to those of Lopes (2001). A correlation analysis between earnings and share prices confirmed the negative relationship between the variables, as can be seen in Table 2.

**Table 2**

<table>
<thead>
<tr>
<th>EPS</th>
<th>SP</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS</td>
<td>1</td>
</tr>
<tr>
<td>SP</td>
<td>-0.215565</td>
</tr>
</tbody>
</table>

Table 3 shows the results obtained after inserting the deferred charges per share variable (DEFPS) in the model.
Table 3

\[ SP_{ij} = w_0 + w_1 \text{EPS}_{ij} + w_2 \text{BVPSNDEF}_{ij} + w_3 \text{DEFPS}_{ij} \]

<table>
<thead>
<tr>
<th>Variable</th>
<th>W</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3.5449</td>
<td>0.0000</td>
</tr>
<tr>
<td>EPS</td>
<td>-0.1381</td>
<td>0.0325</td>
</tr>
<tr>
<td>BVPSNDEF</td>
<td>0.3200</td>
<td>0.0000</td>
</tr>
<tr>
<td>DEFPS</td>
<td>10.5979</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Cross-sections included: 768
Total observations: 3978
Adjusted \( R^2 \): 0.2458
P-value (F-statistic): 0.0000

*Considering a 0.05 level of significance.

As can be seen in Table 3, the adjusted \( R^2 \) of the model was lower than in the previous analysis. It should be stressed that in this analysis, we subtracted the value of the deferred charges (DEFPS) from the book value (BVPS), obtaining the net BVPS. The results indicate that the value of the deferred charges, recognized and accounted for in the periods analyzed, reduces the opportunity of the accounting information. Nevertheless, the coefficient of DEFPS has a significant impact on the behavior of the share price.

In view of the behavior of deferred charges in the value-relevance of accounting information, we expanded the analysis to include the value of the variation in deferred charges in each period (Table 4).

Table 4

\[ SP_{ij} = w_0 + w_1 \text{EPS}_{ij} + w_2 \text{BVPSNDEF}_{ij} + w_3 \text{DEFPS}_{ij} + w_4 \text{VARDEF}_{ij} \]

<table>
<thead>
<tr>
<th>Variable</th>
<th>W</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>8.1005</td>
<td>0.0000</td>
</tr>
<tr>
<td>EPS</td>
<td>-0.2728</td>
<td>0.0000</td>
</tr>
<tr>
<td>BVPSNDEF</td>
<td>0.2407</td>
<td>0.0000</td>
</tr>
<tr>
<td>DEFPS</td>
<td>-0.1253</td>
<td>0.5817</td>
</tr>
<tr>
<td>VARDEF</td>
<td>1.8182</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Cross-sections included: 576
Total observations: 2216
Adjusted \( R^2 \): 0.5617
P-value (F-statistic): 0.0000

*Considering a 0.05 level of significance.

Table 4 shows an interesting fact: when inserting the variation of deferred charges (VARDEF), the value of the deferred charges per share (DEFPS) ceased to be significant in the model and the variation of the adjusted \( R^2 \) is significant. An examination of the data collected shows that VARDEF in all periods is equal to or greater than zero, i.e., the variation, when it exists, refers to new investments forming deferred charges. However, the results found demonstrate that such investments make the model more significant. It can be seen that they increase the model’s explanatory power more than does deferred charges per share (DEFPS) itself.

Since our objective was to analyze transactions with investments of an intangible nature, as can be observed in Table 5, we inserted the proxy for goodwill (GROA) in the model, calculated using the approaches of LEV (2004) and STEWART (1998).
Table 5

\[ SP_{ij} = w_0 + w_1 \text{EPS}_{ij} + w_2 \text{BVPSNDEF}_{ij} + w_3 \text{DEFPS}_{ij} + w_4 \text{GROA}_{ij} \]

<table>
<thead>
<tr>
<th>Variable</th>
<th>W</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>7.8349</td>
<td>0.0002</td>
</tr>
<tr>
<td>EPS</td>
<td>-0.1567</td>
<td>0.0266</td>
</tr>
<tr>
<td>BVPSNDEF</td>
<td>0.2694</td>
<td>0.0017</td>
</tr>
<tr>
<td>DEFPS</td>
<td>9.5480</td>
<td>0.0021</td>
</tr>
<tr>
<td>GROA</td>
<td>-0.0048</td>
<td>0.0756</td>
</tr>
</tbody>
</table>

Cross-sections included: 768
Total observations: 3978
Adjusted R²: 0.5059
P-value (F-statistic): 0.0000

**Considering a 0.10 level of significance.

Table 5 indicates that the inclusion of the goodwill proxy reduced the model’s predictive ability, so that there was little statistical significance.

Nevertheless, as shown in Table 6, once again when including the variation in deferred charges (VARDEF), there was a significant increase in the model’s explanatory power, confirming the incremental explanatory power of new investments under the rubric of deferred charges.

Table 6

\[ SP_{ij} = w_0 + w_1 \text{EPS}_{ij} + w_2 \text{BVPSNDEF}_{ij} + w_3 \text{DEFPS}_{ij} + w_4 \text{GROA}_{ij} + w_5 \text{VARDEF}_{ij} \]

<table>
<thead>
<tr>
<th>Variable</th>
<th>W</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>8.8614</td>
<td>0.0000</td>
</tr>
<tr>
<td>EPS</td>
<td>-0.2753</td>
<td>0.0000</td>
</tr>
<tr>
<td>BVPSNDEF</td>
<td>0.2275</td>
<td>0.0000</td>
</tr>
<tr>
<td>DEFPS</td>
<td>-0.1675</td>
<td>0.4837</td>
</tr>
<tr>
<td>GROA</td>
<td>0.0018</td>
<td>0.0971</td>
</tr>
<tr>
<td>VARDEF</td>
<td>1.7597</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Cross-sections included: 576
Total observations: 2216
Adjusted R²: 0.6224
P-value (F-statistic): 0.0000

**Considering a 0.10 level of significance.

In the model presented in Table 6, when inserting the variation in deferred charges (VARDEF), the value of deferred charges (DEFPS) was not significant and the value of goodwill (GROA) had low significance.

In the model shown in Table 7, we inserted the variable LNREV (log of net revenue in each period) in the equation.
In this model we considered all the variables together, as per the model proposed and described in the methodology for the work. It can be seen that the effect of weighting for the size of the companies produced the following results: the adjusted $R^2$ declined; the value of deferred charges (DEFPS) became significant; and only goodwill showed little contribution to the model (significant, however, considering $\alpha = 0.10$). It should be stressed that the insertion of this control variable reduced the model’s predictive capacity. An interesting fact in this analysis is that the constant (C) and the coefficients of net earnings (EPS) and deferred charges (DEFPS) had negative impacts on the model. The coefficients of the other variables are positive.

In order to purge from the results the effect of companies that have no deferred charges, we did the analysis considering only the companies that did have deferred charges (DEFPS>0) in the periods analyzed, as shown in Table 8.

It can be seen that the model’s explanatory power (adjusted $R^2$) increased; the earnings per share (EPS), though significant, has a negative impact on the share price; book value per share net of deferred charges (BVPSNDEF), variation in deferred charges (VARDEF) and the log of revenue (LNREV) are significant variables in the model, with a positive effect on the share price; deferred charges per share (DEFPS), for companies that have this account, continues to negatively affect the share price; and goodwill per share (GROA) is not statistically significant.
6 Final Considerations

This study, in considering Brazilian accounting principles on treatment of investments/expenditures on research and development and their effects on the relevance of accounting information for the capital market, was exploratory in nature, and indicated that the value of deferred charges has a negative impact on the share prices of Brazilian companies.

In analyzing the impacts of investments in intangibles, specifically goodwill per share, considering all the variables proposed (Tables 6 and 7), we found that the coefficient of this variable is statistically significant, at a 5% level. The proxy for goodwill used in the valuation model here, derived from the concepts of LEV (2004) and STEWART (1998), apparently did not present significant conceptual adherence to the reality of Brazilian companies.

We found that the variation in deferred charges (VARDEF) of Brazilian firms in the periods analyzed was significant to analyze the relevance of accounting information, more so than that presented by deferred charges and goodwill. We should point out that in this case the variation in deferred charges refers to new investments, because a specific analysis of the data revealed that this variation was non-negative in all years.

One of the limitations of this study results from the fact that the analyses did not contemplate the effects of the variables (Tables 6 and 7) by economic sectors, because the outlays on research and development can vary substantially among sectors. An alternative to reduce this variation in part was to use the generalized least squares (GLS) method, with weighted cross-sections, seeking to correct for the presence of heteroskedasticity, by means of using the residual variances of the cross-sections and weighting the variables of each company.

Besides this, it should be stressed that the variability of the relevance of deferred charges, in the Brazilian scenario, can be related to the fact that Brazilian accounting is influenced by corporate and tax legislation, which impose specific rules to treat the respective R&D expenditures.

In view of the alternative procedures and treatment of intangibles (deferred charges), regulated by corporate legislation, margin is opened for management to engage in earnings management. Managers can opt in a particular period to account for deferred charges as assets or expenses (in the results). These alternative practices can hinder the analysis of the real effects of these items on share prices.

According to the results obtained, it was not possible to find significant evidence that items of an intangible nature (goodwill) do not impact share prices (considering a 10% level of significance), particularly because we found that new investment under the rubric of deferred charges significantly affected the share prices (see VARDEF). These results favor not rejecting the hypothesis that: The current share prices of Brazilian companies can be explained by accounting variables (earnings, book value, deferred charges) and by goodwill, with statistically significant coefficients.

The inferences made in this study are restricted to the sample and the periods analyzed. All the limitations of the work are related to the models and proxies utilized. Other, more robust, statistical analyses might bring more accurate perceptions regarding the items of an intangible nature.

For future research, we suggest examining specific economic sectors, which can influence the significance of the coefficients of deferred charges, variation in deferred charges, deferred expenses and goodwill.

References


According to Fipecafi (2001, p. 129), “the dimensioning of the goodwill permits the conciliation between the overall values and the items of equity of an enterprise. This characteristic is taken as very important in identifying the expectations of wealth generation.” However, “from the standpoint of the concepts of objectivity and predictability, goodwill can be highly questionable, depending on the valuation options adopted.” (FIPECAFI, 2001, p. 130).

An ongoing project to improve on previous works of the following researchers: Rezende and Lopes (2005), Rezende (2005) and Alencar and Dalmácio (2006).

BR-GAAP – Brazilian generally accepted accounting principles.