

Valuation Properties of Accounting Numbers in Brazil

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Abstract: this work investigates the valuation properties of accounting numbers in Brazil under three traditional frameworks: earnings capitalization, book value of equity and residual income. The sample was selected from companies traded at the São Paulo Stock Exchange (BOVESPA) from 1995 to 1999, dividing the sample in two groups: companies with preferred and with common shares. My results show that the earnings capitalization model did not perform well for common shares and have a better performance for preferred shares because of the mandatory dividend distribution as a percentage of net income in Brazil and because earnings have no use as information asymmetry reducers in Brazil. The book value model performed better for common shares than for preferred shares while residual income had a comparable performance. This demonstrates that book value seems to be the dominant accounting-based valuation model for common shares. For preferred shares the residual income model performs better. The residual income term alone presents no significant difference for the two sets of companies. For both set of companies accounting income did not incorporated economic income.

Key words: valuation; emerging markets; international accounting; residual income; quality of earnings

Data Availability: data are available from sources identified in the paper

I. Introduction

Under the economics-based positive paradigm, accounting is viewed as relevant only if it has clear impacts on users economic decisions. In the capital market arena these users are easily identified as investors: institutional or individuals. Equity investors are concerned with firm valuation in order to orientate their investment decisions. The role of accounting information in firm valuation has been an active area of research in financial accounting. Penman and Sougiannis (1998), just one example, investigated the role of cash flows, dividends, and earnings approaches to security valuation providing evidence of the superiority of accounting measures when compared to cash flows and dividends. The role of accounting numbers in securities' valuation is an active and challenging debate in the accounting literature.

However, almost all the evidence on the properties of accounting numbers for equity valuation has been obtained in developed markets specially in the US and UK. Emerging markets are not so well investigated as the developed ones. Little evidence exists on how market imperfections, concentrated ownership etc, can affect the relevance of accounting numbers. Recent research has shown that accounting earnings are not asymmetrically biased towards conservatism in Brazil (Lopes, 2001). This evidence is consistent with the results of Ball et all (2000) and Ball and Shivakumar (2001), which showed that earnings quality is not a function of accounting standards characteristics. Demand for accounting information is a much more relevant factor. Common vs. code law countries present completely different functions for accounting information; these functions determine accounting relevance for investors. Despite this evidence, accounting properties for security valuation in emerging markets remains an unanswered question.

In this work I investigate the role of accounting numbers for security valuation in Brazil as proxy for an emerging market. Specifically, I test three valuation models well used in the literature: earnings capitalization, book value and residual income. I assess each model's performance by examining its explanatory power and testing whether the estimated parameters lie within the bounds predicted by the model. I use a sample of 318 firm-year observations for common shares and 693 firm-year observations for preferred shares both traded at the São Paulo Stock Exchange (BOVESPA). This distinction is important in Brazil because preferred shares are more traded and no company really has its control on public hands. Brazilian accounting standards provide an interesting venue for investigation because they come from governmental regulation (through the company law) and allow for more discretion than US-GAAP. This study is the first to document the valuation properties of Brazilian Standards. This investigation attempts to answer the following question: ***is financial accounting information relevant for security valuation purposes in Brazil? If so, which valuation model is better suited for Brazilian data?*** Traditional research (Penman and Sougianis, 1998; Francis et al., 2000) report that the residual income model is the dominant valuation model for US firms that report in accordance to US-GAAP. Previous research has not investigated the performance of the residual income model when valuing non-US firms presenting non-US-GAAP financial statements.

My results show that the earnings capitalization (EC) model does not fit well for common shares confirming previous research that shows earnings as reducers of information asymmetry and as so without any significant role for companies with a strong ownership concentration as Brazilians have. The model, despite modest explanatory power, fits better for preferred shares. This result demonstrates how earnings are important in terms of dividend distribution in Brazil, as dividends are mandatory as a percentage of profits. These results contribute to the debate initiated by Ashbaugh and Olsson (2002). They report superior performance of the earnings capitalization model for firms reporting IAS numbers over the book value and residual income models. They report the reasons for that performance as the violations of the clean-surplus relation so common in the IAS framework (revaluation, for example). My results show a poor performance of the earnings capitalization model for firms issuing common shares and a better performance of the model for firms issuing preferred shares, both preparing statements under Brazilian GAAP. This shows that the relative performance of the model doesn't depend solely on the accounting standards in place but also on the kind of security issued and, consequently, on the corporate governance arrangements present.

The Book Value (BV) model fits extremely well for common shares showing how relevant book values are for security valuation purposes in Brazil. This result is probably due to the legal implications of BV for liquidation. The BV model has a poorer performance for preferred shares showing that investors in those companies are less concerned with the long term prospects of these firms. The Residual Income (RI) model does not present incremental power over the BV model for common shares. It shows significant incremental performance for preferred shares confirming the relevance of earnings for dividend distributions for owners of preferred shares. Finally, accounting income does not incorporate economic income for both cases also confirming previous research. Again, the prevalence of the BV model over EC shows that the demand for accounting information plays a significant role in explaining the performance of the valuation models examined.

The rest of the paper is organized as follows: section II presents a brief introduction to accounting and capital markets in Brazil. Section III presents the models and how I expect them to perform. Results are presented in Section IV and the conclusion on section V.

II. Accounting and Capital Markets in Brazil

Brazil presents a very particular accounting and capital markets scenario. This section does not aim to completely explore the topic but rather to show some aspects that are of great significance for the role of accounting in financial markets. Lopes (2002) provides a more profound treatment of this topic. Brazil has a governmentally regulated accounting profession with great part of the accounting rules coming from the Companies Law issued by the military government in the sixties. These rules allow for great flexibility and discretion in the measurement arena with revaluations and capitalization of research and development expenditures, for example. As a consequence of this structure, Brazilian profession has a minimal part in the regulation of the topic and, as it is expected, accounting in Brazil is seen as a tool to attend the government and the tax authorities. An example of that is the ending (by a law) of the inflation adjustments, which were strongly favored by the profession. Tax regulations have a enormous influence on accounting practice and external monitoring is normally seen as not being the primary function of accounting numbers. Additionally, firms in Brazil haven't traditionally depended on equity markets to finance their operations. Credit has been the major venue for funding. Despite creditors can use accounting information in their decisions its use is very different from the use of accounting for equity valuation purposes.

Financial markets in Brazil possess its own idiosyncrasies also. First the ownership concentration is enormous. No major Brazilian company is really public. Normally, less than three shareholders control the majority of voting capital. This scenario mitigates dramatically the role of accounting as an information asymmetry tool. Owners/managers don't need accounting to monitor the performance of their companies once they have special access to information. This is especially true for preferred shareholders. Under Brazilian law those shareholders don't have voting rights unless the company fail to pay dividends for a three consecutive years period. They are interested in capital gains and dividends, however they don't have any power to impose a given dividend policy

III. Models and Hypothesis

This work uses the same econometric definitions as proposed by Ashbaugh and Olsson (2002). They propose the following three regressions:

□ ***Residual Income framework (RI):***

$$(1) P_{jt} = w_{0t} + w_{1t}BV_{jt} + w_{2t}RI_{jt} + \varepsilon_{jt}$$

Where:

P_{jt}	stock price at the year ending 4 months after year-end
BV_{jt}	book value per share for the period ended at time t
RI_{jt}	Residual Income ⁱ = Net income per share – 0.10 times the one year lagged book value per share adjusted for changes in the number of stocks outstanding.

ε_{jt} error term at time t

This is an empirical implementation of the model developed by Ohlson (1995).

□ **Earnings Capitalization (EC):**

$$(2) P_{jt} = w_{0t} + w_{2t}EARN_{jt} + \varepsilon_{jt}$$

Where:

${}_tEARN_{jt}$ Net income for the period t

This specification is designed to investigate how relevant earnings are for valuation purposes.

□ **Book Value (BV):**

$$(3) P_{jt} = w_{0t} + w_{1t}BV_{jt} + \varepsilon_{jt}$$

This specification compares the accounting valuation of the firm (book value) with the market valuation of the firm (price). Given our level of knowledge of Brazilian accounting standards and Brazilian corporate governance model (Lopes, 2001), we can expect the following results:

- **Intercept:** I do not expect the intercept to be statistically significant for the RI model in common shares. I do expect the intercept to be significant for the RI model for preferred shares and for the EC and BV models for preferred and common shares;
- **Coefficients:** in the book value specification, the coefficient is expected to be lower than one given the non-conservative feature of accounting numbers in Brazil (Lopes, 2001). In the earnings capitalization model, the coefficient is the inverse of the earnings response coefficient (ERC) reflecting the discount rate for permanent earnings. So, it is expected to be lower than one. In the residual income model the RI coefficient is expected to be the inverse of the discount rate to infinity. This results depends on the assumption that abnormal earnings follow an mean-reverting process (AR 1). I expect the book value coefficient to be higher for common shares given its liquidation implications which are not preferred shareholders concern;
- **R²:** RI is expected to have the higher explanatory power for both sets of companies.

There is a rich literature on the appropriateness of these models when valuing US firms' US-GAAP accounting variables (Collins et al, 1999). Investors and other market participants use the EC, BV, and RI models in making investment decisions (Barker, 1998; Goldman Sachs, 1999). These models build on the idea that a firm's market price is equal to investors' expected discounted future cash flows. The specifications proposed test how accounting variables reflect future cash flow information.

Additionally, I test the asymmetric recognition of accounting income.

$$NI_{jt} = \beta_{0t} + \beta_{1t}D + \beta_{2t}R_{jt} + \beta_{3t}DR_{jt} + \varepsilon_{jt}$$

Where:

NI_{jt} net income for the company j for the year t
 D dummy variable that equals one if return R_{jt} is negative and zero otherwise
 R_{jt} annual rate of return for company j at the year t
 ε_{jt} error term at time t

I do not expect accounting income to incorporate economic income in the Brazilian scenario. Earnings are not reducers of information asymmetry in such an environment and as so could not be highly explanative.

IV. Data Selection and Results

The sample was selected from firms traded at the São Paulo Stock Exchange (BOVESPA) in the 1995-1999 period. The database used was ECONOMATICA. Following traditional sample selection procedures, the sample is composed of 318 firm-year observations for common shares and 693 firm-year observations for preferred shares. Table one presents descriptive statistics for the sample showing a huge standard deviation characteristic of Brazilian data.

Table 1
Descriptive Statistics for Common and Preferred Shares
Common Shares Preferred Shares

Variables	Mean	Median	Max	Min	Mean	Median	Max	Min
Net Income	0,17	0,01	20,53	-40,66	-1,25	0,00	65,80	-245,37
Return	27,77	4,17	690,22	-80,11	12,89	-17,39	904,50	-92,89
Price	2,99	0,10	100,00	0,0002	1,83	0,03	137,54	0,001
Book Value	4,47	0,21	203,71	-0,03	2,75	0,07	286,71	-162,11
RI	-0,28	0,00	2,07	-46,06	-1,52	0,00	62,57	-229,16
P/E	9,42	5,50	360,00	-59,59	3,64	2,03	457,66	-404,06
MTB	0,87	0,58	6,39	-6,03	0,72	0,32	71,48	-14,52

Correlation matrix for both common and preferred shares is presented at the Table 2 showing reasonable low levels for the variables investigated.

Table 2
Correlation Matrix for Common and Preferred Shares*

	Net Income	Return	Price	BV	RI	P/E	MTB
Net Income	1,00	0,06	-0,45	0,03	0,99	0,01	-0,07
Return	0,00	1,00	-0,01	-0,03	0,07	0,05	0,08
Price	0,02	0,04	1,00	0,65	-0,54	0,02	0,21
BV	0,12	-0,05	0,87	1,00	-0,11	-0,01	-0,01
RI	0,73	0,04	-0,58	-0,59	1,00	0,01	-0,07
P/E	0,02	0,06	-0,01	-0,01	0,02	1,00	0,25
MTB	0,00	0,26	0,06	-0,04	0,03	0,02	1,00

*Numbers in the upper diagonal are for preferred shares and numbers in the lower diagonal are for common shares

Following, the results of the models are presented in Table 3 below which shows that the Earnings Capitalization (EC) Model has a poorer performance for the common shares sample (R^2 of 0,00) and a better performance for the preferred shares sample (R^2 of 0,20). This result

is expected given the Brazilian ownership structure where public companies are virtually non-existent and earnings do not play a significant role as information asymmetry reducers. The BV model performed extremely well for common shares and with a lower, however significant, explanatory power for preferred shares. This result is probably due to legal (liquidation) implications of the BV for common shareholders. The RI model performs equally better for common shares than for preferred shares. However, isolating the RI term, it is shown that this better performance for common shares is totally due to the BV effect. The RI term has the same impact for common and preferred shares.

The intercepts are significant for all models showing that the accounting numbers valued by the market are not reported on balance sheets for the sample. The superior performance of the BV and EC models for both sets confirms the notion that adding balance sheet variables to income statement variables improves the performance of both samples.

Table 3
Comparisson of Valuation Properties of Accounting Numbers for Common and Preferred Sharesⁱⁱ

$$EC \text{ Model: } P_{jt} = w_{0t} + w_{2t}EARN_{jt} + \varepsilon_{jt}$$

$$BV \text{ Model: } P_{jt} = w_{0t} + w_{1t}BV_{jt} + \varepsilon_{jt}$$

$$RI \text{ Model: } P_{jt} = w_{0t} + w_{1t}BV_{jt} + w_{2t}RI_{jt} + \varepsilon_{jt}$$

Panel A: Common Shares

EC Model	Intercept	Earnings	Book Value	RI	Adj R ²
Coefficient	2,97	0,08			0,00
(std error)	0,63	0,27			
p-value	0,00	0,75			
BV Model	Intercept	Earnings	Book Value	RI	Adj R ²
Coefficient	0,79		0,49		0,75
(std error)	0,32		0,02		
p-value	0,0157		0,0000		
RI Model	Intercept	Earnings	Book Value	RI	Adj R ²
Coefficient	0,83		0,46	-0,42	0,76
(std error)	0,32		0,02	0,13	
p-value	0,0099		0,0000	0,0019	

Table 3 (continued)

RI Alone	Intercept	Earnings	Book Value	RI	Adj R ²
Coefficient	2,36			-2,24	0,33
(std error)	0,52			0,18	
p-value	0,0000			0,0000	

Panel B: Preferred Shares

EC Model	Intercept	Earnings	Book Value	RI	Adj R ²
Coefficient	1,47	-0,29			0,20
(std error)	0,32	0,02			
p-value	0,0000	0,0000			

BV Model	Intercept	Earnings	Book Value	RI	Adj R ²
Coefficient	1,06		0,29		0,42
(std error)	0,27		0,01		
p-value	0,0001		0,0000		
RI Model	Intercept	Earnings	Book Value	RI	Adj R ²
Coefficient	0,66		0,26	-0,30	0,64
(std error)	0,21		0,01	0,01	
p-value	0,0021		0,0000	0,0000	
Table 3 (continued)					
RI Alone	Intercept	Earnings	Book Value	RI	Adj R ²
Coefficient	1,30			-0,35	0,29
(std error)	0,30			0,02	
p-value	0,0000			0,0000	

Where:

P_{jt}	stock price at the year ending 4 months after year-end
BV_{jt}	book value per share for the period ended at time t
RI_{jt}	Residual Income = Net income per share – 0.10 (one year lagged book value per share) adjusted for changes in the number of stocks outstanding.
$EARN_{jt}$	Net income for the period t
ε_{jt}	error term at time t

As expected, accounting income fails to recognize economic income for both common and preferred shares. It seems that Brazilian accounting rules are not designed for economic representation but for tax and governmental purposes. This results confirms the superiority of balance sheet numbers over income statement numbers in Brazilian GAAP.

Table 4

Contemporaneous Association between Earnings and Returns for Preferred and Common Shares

$$NI = \beta_{0t} + \beta_{1t}D + \beta_{2t}R + \beta_{3t}DR + \varepsilon_{jt}$$

	β_{0t}	β_{1t}	β_{2t}	β_{3t}	R ²
Preferred	-0,14 (-0,13)	1,02 (0,57)	0,00 (0,23)	0,07 (2,26)**	0,01
Common	-0,23 (-0,99)	0,64 (1,43)	0,00 (1,30)	-0,001 (-0,20)	0,01

Where:

NI_{jt}	net income for the company j for the year t
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D	<i>dummy variable that equals one if return R_{jt} is negative and zero otherwise</i>
R_{jt}	<i>annual rate of return for company j at the year t</i>
ε_{jt}	<i>error term at time t</i>
*, **, ***	<i>significant at 0,01 level, 0,05 level and 0,10 level respectively</i>
t statistics in parentheses.	

V. Concluding Remarks and Suggestions for Future Research

This paper documents the relative performance of the Earnings Capitalization, Book Value of Equity and Residual Income models for Brazilian Companies listed at the São Paulo Stock Exchange (BOVESPA). The sample is divided into companies issuing preferred shares and companies issuing common shares. My results show that the EC model presents a poor performance for companies issuing common shares when compared to companies issuing preferred shares. The BV model dominates EC and RI models for common shares. For preferred shares, the RI model shows superior performance over the BV and EC models. Accounting income fails to incorporate economic income for both sets of companies. These results show that security design, demand for accounting information and corporate governance arrangements have a strong influence on the relative performance of the security valuation models examined.

Future research would be directed to what factors determine this valuation structure. From a theoretical point of view there is much research to be done on the determinants of the value of preferred shares in Brazil. Financial accounting research is currently totally directed to the valuation of equity. The valuation of debt and debt-like instruments or convertibles lacks any further investigation even in the international literature.

Another possible venue for deeper investigation is the corporate governance structure that underlies most of the contracts in Brazil. Recent research suggests that corporate governance arrangements play a major role on the level of the use of accounting information by investors and other participants. Brazil is a very special case of a very concentrated market with, at least formally, public companies. What are the implications of this kind of arrangement? Do accounting information plays other roles in this scenario? I believe the answer to these questions can improve our understanding of the theoretical foundations of accounting.

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ⁱ Additional sensitivity tests were performed with other rates. Empirical evidence (Ashbaugh and Olsson, 2002) has shown that results do not change with substantial variations in the rate.