COMPARISON OF TRADITIONAL FINANCIAL ACCOUNTING INDICATORS WITH EVA® COMPANIES IN THE BUILDING IN ORDER TO ASSESS ITS ADVANTAGES AND DISADVANTAGES

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Abstract

This paper intends to perform the calculation of its EVA® and compare it with the traditional economic indicators in the determination of net income, verifying the advantages and disadvantages of applying (EVA®) as a Management System Based on value. The relevance of this study is to recognize the best proposal that adequately to measure the amount of capital and its opportunity cost. The proposed methodology is based on applying a metric to adequately measure the value of capital and the cost of their compensation through comparison between the traditional method and (EVA®) ten construction companies extracted from the BM & FBOVESPA website. The study results point out that the book profit does not represent the actual value of gain or loss to the stakeholders. The loss itself does not mean prejudice because the traditional metric does not include the opportunity cost.

Keywords: EVA®, WACC, cost of capital,as Based Management system value

1. INTRODUCTION

In order for companies to remain competitive, they have been conducting a number of structural changes. For that purpose, ongoing structural reorganization becomes part of the daily life of the vast majority of the companies, resulting in the search for new methods and management techniques capable to help them to meet the financial market requirements and stand them out from among competitors.

Business performance evaluation methods, supported only by accounting and financial indicators, are revealed, therefore, to be unsafe according to the market evaluation criteria and not to include all items necessary to perform such evaluation, which is the case of the long-term profitability drivers. This uncertainty caused new value creation-based, competitive management strategies to emerge, capable of giving direction to the companies surrounded by this increasingly abyssal environment (Lueg, 2010).

This finding conducted this study to the analysis of EVA® as a value-based management method for the composition of a financial and economic indicator, the formulation of which by a number of companies of the construction industry enabled to compare and measure EVA® calculation results among them.

The EVA® methodology meets shareholders and managers' need for information, as it reveals whether there is generation of wealth in an investment. Almost opposed to the EVA®, traditional indicators can only show company's financial performance, rather than the details required for an efficient, effective and timely manner decision making, which are known to be the essence for an optimal performance. In this sense, the following problem situation is proposed: How is it possible for a company to obtain a negative, zeroed or positive EVA®, when its Income Statement, which is based on accounting assumptions, demonstrates there to be a net income and why this occurs?

This study aims to show the pros and cons in the use of EVA® as a performance indicator for business growth and a value-based management tool.

It also intends to show how important EVA® is for companies, accounting scholars and researchers on the subject, with a view to describe and identify by means of comparison of the EVA® methodology, whether traditional indicators consider profit from the accounting perspective as an indicator to be used in decision making.

2. LITERATURE REVIEW

2.1 Creating shareholder value

Companies that create value have greater access to financial resources for growth and investment. Those companies' businesses usually deliver value to their customers and enjoy this competitive edge. Globalization provided an increasingly challenging and sometimes hostile environment. Therefore, companies need to develop strategies that enable them to survive and compete successfully. A quick and agile adaptation to a fast-evolving world is of the essence.

The longevity of a company is directly related to its daily capacity for innovation and continuous learning, while adapting to the changes in the world that surrounds them.

Based on this assumption, what method of performance evaluation must be used by the company in order to validate this conclusion?

The fact is that a methodology based on traditional economic performance evaluation indicators cannot determine whether there is creation or destruction of wealth and, consequently, an increase or decrease in the market value of companies.

As a result, a new evaluation method has been presented in order to meet this need. The EVA®, whose methodology enables an in-depth analysis of companies' economic results, and determines whether the company is creating or destroying wealth.

2.2 Economic Value Added (EVA®) concept and NOPAT

EVA® is a financial management system that measures the return obtained on equity or debt capitals by their owners. It measures the difference between the return on a company's equity capital and the cost of that capital.

According to Gitman (2006), EVA® is a measure used to determine whether an investment contributes or not to generate wealth for the owners. Gitman affirms that EVA® is calculated by subtracting the cost of financial resources used to fund an investment from its operating profits after taxes.

According to Harrison (2011), the economic value added concept is aimed at determining the true economic profit of a company. It uses the understanding of financial accounting to measure operations that contributed to the increase in shareholders' wealth. Basically, it represents the residual income generated by a company after the deduction of capital costs. It specifically represents the operating profit minus the capital needed to form the capital employed. EVA® is a registered trademark of financial consulting firm Stern Stewart Gestão Services, Inc.

Ehrbar (1999, p.1) states: "Put most simply, EVA®, an acronym for economic value added, is a measure of corporate performance that differs from most others as it charges the company's profit for the cost of all the capital used by the company."

NOPAT = acronym for "Net Operating Profit After Taxes". Its equivalent in the traditional accounting is the Net Operating Income.

Putting it in a simple manner, NOPAT corresponds to Net Income minus Operating Costs and Expenses (including Depreciation) minus some specific company adjustments and taxes.

Capital Charge = Capital Employed $\times$ Cost of Capital.

Capital Employed: According to EVA® methodology, Capital is the equivalent of the Accounting Balance Sheet. Similarly the Balance Sheet, it can also be analyzed from two perspectives: that of source of funds, called Financial Capital, and allocation of resources, called Operating Capital.

Cost of Capital: The EVA® methodology uses the weighted average cost of capital (WACC), which represents the minimum return required by the providers of capital to the company. It is the weighted average of the cost of equity and the cost of debt.

According to Morard et Balu (2009), Capital Employed represents one of the three main components to measure EVA®: In this methodology, capital is equivalent to that of the Balance Sheet in traditional accounting, the only difference being the fact that the traditional measure does not include the costs of acquisition of capital employed.

According to Assaf Neto (2008), capital is divided into shareholders' equity and debt capital composition of the capital cost so that cost of capital is formed.

Unlike traditional indicators, which only considers the cost of debt, claiming that profit is the return on shareholders' equity, it also takes the cost of capital into account.

For Seoki (2009), the EVA® concept fits as an important instrument of control in the context of financial planning and

control. It measures the value added during a period of time defined by increased margins and profitable redeployment of assets, in addition to being a tool that helps formulate strategies. It is also used to manage financial performance. Value creation becomes a performance measure tool for those margins and the key to their sustainability.

Malvessi (2000, p.43) presents the concept of EVA® methodology in a fully technique manner. In order for EVA® to be calculated, the following formula is used: NOPAT (Net Operating Profit after Taxes, plus depreciation and some accounting adjustments) deducted from their WACC (Weighted Average Cost of Capital).

Acoording to Gitman (2010), Mathematically, economic value added (EVA) is the after-tax operating profits that a firm earns from an investment, minus the cost of funds used to finance the investment. If the resulting value is positive (negative), shareholders wealth is increased (decreased) by the investment. EVA is used for determining if an existing or planned investment will result in an increase in shareholder wealth, and should thus be continued in order to fulfill the financial management function of maximizing shareholder wealth.

2.3 Adjustments to the financial statements for calculation of EVA®

EVA® safely and efficiently portrays the economic situation of companies. However, EVA® calculation is based on their financial statements, which in some cases distorts companies' real economic situation for other purposes (compliance with tax authorities, in the Brazilian case).

For this reason, adjustments are made in traditional financial statements with a view to better reflect the economic performance of the Company through an appropriate measure of value creation for investors (shareholders and third parties).

Figure 01 provides a general view of EVA® methodology understanding and dimension:

Figure 01. Adjustments needed for EVA®

Source: The authors own (2013).

For this reason, adjustments are made in traditional financial statements with a view to better reflect the economic performance of the Company through an appropriate measure of value creation for investors (shareholders and third parties).

The EVA® Model creators identified more than one hundred sixty potential adjustments with respect to accounting policies, involving the period of recognition of revenue and expenses, financing not entered in the balance sheet, foreign currency exchange, valuation of inventories, inflation, among others (Ehrbar, 2000; p.131 and 133).

2.3.1 Calculating NOPAT from the Income Statement

According to the NOPAT concept, as described on pages 03-05, and comparing the traditional Income Statement against NOPAT Statement, the following result is obtained:

Table 01. Income Statement x NOPAT

Statement of Income	NOPAT
Gross Revenue	**Gross Revenue**
(-) Taxes and Deductions	(-) Taxes and Deductions
(=) Net Revenue	**(=) Net Revenue**
(-) Cost of Goods Sold	(-) Cost of Goods Sold
Gross (=) Income	**Gross (=) Income**
(-) Operating Expenses	(-) Operating Expenses
(=) EBITIDA	**(=) EBITIDA**
(-) Depreciation	(-) Depreciation
(=) EBIT	**(=) EBIT**
(+) Interest Income	
(-) Interest expense	
(=) Operating Income	**(=) NOPBT**
(+) Income from Operations	
(+) Extraordinary Items	
(=) Income before Taxes	**(=) NOPBT**
(-) Income Tax and Social Contribution	(-) Tax Operating Cash
(-) Minority Interest	(-) Minority Interest
(=) Net Income	**(=) NOPAT**

Source: Stern, Stewart & Co (2001)

The above table reveals the following issues:

• Financial Expenses are not considered as part of NOPAT, as the cost of debt is charged via the Capital Charge;

• Financial income may (or may not) be considered in the calculation, if the characteristics of business operations recommend Cash to be included (or not) as part of the company's capital;

• In addition to Financial Expenses, the Non-Operating Income and Extraordinary Items are also excluded from NOPAT;

• The tax effects from Financial Expenses, Non-Operating Income and Extraordinary Items are excluded from the Income Tax and Social Contribution assessed in the Income Statement;

• The Accounting Provisions, Income Tax and Social Contribution are processed on a cash basis.

2.3.2 Capital Charge

Capital Charge is to be understood as the return or minimum compensation payable to shareholders (Ke) and to cost of debt (Ki) owed to third parties borrowing funds to the company at a pre-set cost (interest) referred to as Capital Cost. The value of the Charge of Capital is a result obtained by multiplying the Capital Employed (shareholders' equity and debt capital) by the Cost of Capital, where:

• Capital Employed or Financial Capital corresponds to the right side of the Balance Sheet (Liabilities), represented by sources of funds (shareholders' equity and debt capital). Likewise, Operating Capital corresponds to the left side of the Balance Sheet (Assets) and represented by the investment of financial resources (goods and rights).

• The Cost of Capital or Weighted Average Cost of Capital (WACC) represents the minimum return required by providers of capital to the Company. It is the weighted average between the cost of shareholders' equity and the cost of debt.

According to Ross, Westerfild et Jaffe (1995), the method of Weighted Average Cost of Capital, or WACC, is defined as follows:

> "The WACC approach is based on the assumption that indebted companies' projects are financed with both debt capital and equity capital. The cost of capital is a weighted average between the cost of debt capital and the cost of equity."

For Guthrie (2012), the WACC conceptual understanding is used as a key aspect and milestone to determine all the work, where the overall economic cost of an individual project is not only the capital expenditure involved, but also the reduction of the value of such cost of capital to the benefit of the business growth. The investment becomes optimal only when the internal rate of return exceeds the project weighted average cost of capital, referred to as WACC.

Liapis (2010) in his article differentiated management based models and value-based management model, such as: Residual Model of Value (RMV), EVA®, Cash Value Added (CVA), with the main components of residual income (RI), Free Cash Flow (FCF) and the weighted average cost of capital (WACC). These metrics and methodologies have raised interest among scientists, professionals and organizations over the past years.

For Jung (2008), the article discusses the concept of the average cost of capital, or WACC, through a simple proposal, which aims to evaluate the performance from a value perspective. It uses two distinct models for understanding WACC, by using different functions for their understanding and use, such as the Du Pont model (Return on Assets) and the weighted average cost of capital.

For Morard et Balu (2009), The cost of debt should be considered after taxes, so that tax benefit generated by the interests allocated in the traditional Income Statement is excluded. Thus, this benefit should be considered when calculating the Charge of Capital, through WACC.

2.3.3 Capital employed

Capital Employed (or simply Capital) is represented by the amount of funds given to the company by investors (shareholders and third parties) for the generation of NOPAT over the period. Thus, the calculation of Capital should be consistent with the calculation of NOPAT (Figure 02):

**Figure 02.** Statement of sources and application of funds, structure of the Balance Sheet to calculate the NOPAT
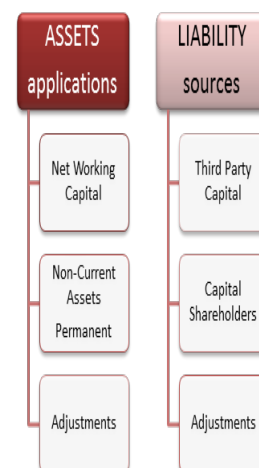
Source: The authors own (2013)

The value of Capital is taken from the Balance Sheet and stated in two approaches in the EVA® methodology, similarly to what occurs in traditional accounting:

• The Operating Capital represented by funds invested in Assets consists of the Net Working Capital plus Long-Term Assets and adjustments, minus the Non-Interest-Bearing Long Term Liabilities.

The Net Working Capital (Figure 03) consists of the Operating Current Assets (excluding Cash) minus the Non-Interest-Bearing Short Term Liabilities. The latter represents the portion of the cost of debt that the Company does not need to explicitly pay, and whose main accounts are Suppliers, Taxes Payable, Wages Payable and Other Accounts Payable. This capital is deemed of non-interest-bearing nature because its cost is already included in the price of goods/services purchased by the company:

Figure 03. Operating Capital
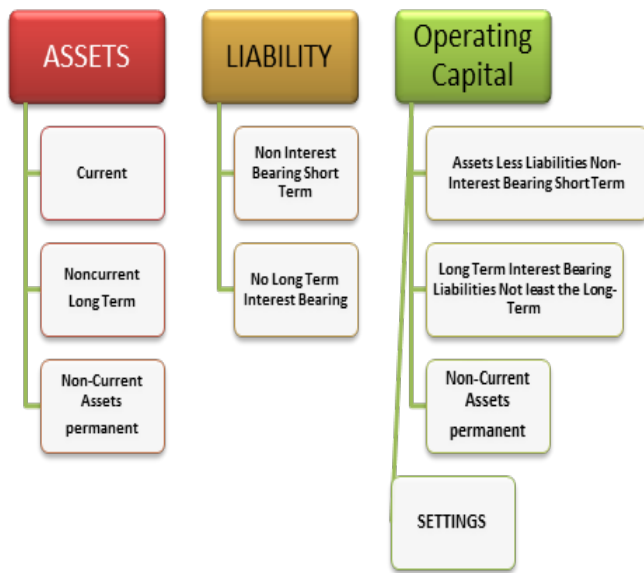
Source: The authors own (2013)

• The Financial Capital represented by the funds from shareholders and third parties (Liabilities), consider the necessary adjustments. The Debt comprises all onerous debts of the company, including those not recorded in the Balance Sheet, such as operating lease transactions, debt to pension funds, gas contracts with take-or-pay provisions, etc. The Equity comprises the Shareholders' Equity.

• It is noteworthy that Non-Interest-Bearing Current Liabilities do not appear in the Financial Capital, contrary to what occurs with the Liabilities of the Balance Sheet. These liabilities are excluded from the company's Operating Capital because they represent a spontaneous source of funds whose cost is already included in the cost of goods purchased by the company.

2.3.4 Cost of capital - WACC

The Weighted Average Cost of Capital (WACC) is the minimum return required by Company's capital providers. It is the weighted average of the cost of equity and the cost of debt:

The WACC is composed of two parts: the Cost of Debt and the Cost of Equity, and is calculated by the following formula:
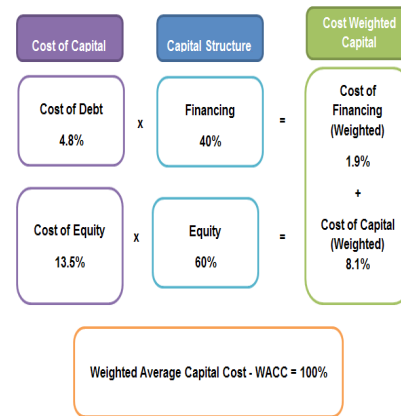
$$WACC = CD \times (D/C) + CE \times (E/C) \qquad (1)$$

Where,

• CD = Cost of Debt after taxes in U.S. dollars;

• CE = Cost of Equity in U.S. dollars;

• D/C = Debt / Total Capital (at market or book values);

• E/C = Equity / Total Capital (at market or book values); and

• Total capital = Equity + Debt (at market or book values).

Figure 04 below shows how the WACC is calculated:

Figure 04. Calculation of WACC

Source: Stern, Stewart & Co (2001)

Therefore, it is assumed that the total funds invested in the activities of a company ($ 1,000) are funded by third parties ($ 400) and the shareholders ($ 600), and that the required return on capital invested by them is of 4.8% p.a. and 13.5% p.a., respectively.

At the end of one year, the value of the capital charge of this company will be $ 100 [($ 400 x 4.8%) + ($ 600 x 13.5%)] or 10% of the total resources invested ($ 1,000).

If that same company had closed a NOPAT of $ 90, that year, it would have a negative EVA® of $ 10 (NOPAT minus WACC) indicating value destruction. Such shareholder value destruction can be explained when we consider that they have neither obtained the minimum return nor the opportunity cost required for the invested capital of $ 81

($ 600 x 13.5%), because after the return of debt in $ 19 ($ 400 x 4.8%), only $ 71 remained from the NOPAT for the company's shareholders, thus, leaving $ 10 (negative EVA®) "missing" to the minimum return of $ 81 for shareholders.

2.3.5 EVA® Adjustments

The EVA® Model creators identified more than one hundred sixty potential adjustments with respect to accounting policies, involving the period of recognition of revenue and expenses, financing not entered in the balance sheet, foreign currency exchange, valuation of inventories, inflation, among others (Ehrbar, 2000; p.131 and 133).

When calculating the EVA® of a company, there are two main reasons that explain the adjustments:

• to portray the economic reality, removing accounting distortions, which improves the correlation of the EVA® measure to the market value of the company;

• to distinguish operating activities from financial activities, highlighting the results of each. This effect comes embedded in the concept of EVA® itself, which measures the operating performance through NOPAT, and the financial performance through the Capital Charge.

The major adjustments required in the financial statements are detailed in figure 05 below:

Figure 05. Major adjustments

Source: The authors own (2013)

2.4 How to calculate the EVA®

According to Vogel (2011), the Economic Value Added - EVA® is calculated based on this formula:

EVA = NOPAT – (Capital Employed × WACC)   (2)

Where,

(NOPAT = Net Operating Profit After Taxes), represents the opportunity cost;

Capital Employed;

WACC: Weighted Average Cost of Capital: it is the capital invested, both equity and debt capital. In this formula, the EVA® is the residual income, i.e., the net operating profit after tax less the cost of capital employed in the investment.

Calculation of Economic Value Added - EVA® it is calculated based on the following formula: (NOPAT = Net Operating Profit After Taxes), adapted from The Quest for Value (1990:137), where: NOPAT: Net Operating Profit After Tax, in which financial costs are not included in WACC: Weighted Average Cost of Capital: it is the capital invested, both equity and debt capital. In this formula, the EVA® is the residual income, i.e., the net operating profit after tax less the cost of capital employed in the investment. Some adjustments are required to determine the NOPAT and the Capital. Based on the book income to find the economic income, Frezatti (2001: 51-60) classifies the necessary adjustments as follows: EVA® = NOPAT – WACC x Capital. Stewart (1990:435) determines the cost of debt in a more direct manner:

2.5 Determining the average cost of capital

The cost of debt can be determined in a more direct manner. For Stewart (1990: 435):

> "The cost of debt is the rate that a company should pay in the current market for new long-term financing. Its best indication is the prevailing rate in the negotiation of company's debts in the public and open market. In the absence of a quotation for its debits, the cost of debt of a company can be determined by an approximation based on the current rate being paid on the acquisition of debits from companies with the same review."

Example of WACC calculation:

Note: The cost of financial and long term liabilities should be after taxes, because these types of funds engender tax reduction; therefore, its cost should be reduced proportionately to this saving (an effect named financial leverage). In this example, the income tax rate is of 30%.

Follows below the capital structure of the company in the example and its costs:

(Short-term) financial liabilities with 15% of the total with cost of 25%.

Long-term liabilities with 30% of the total with cost of 20%.

Equity (shareholder's equity) with 55% of the total with cost of 30%.

Table 02. Example of WACC calculation

Source of capital	Weight A	After tax cost B	Weighted cost C=A*B
Financial liability	0,15	25% x (1 - 0,3)	2,63
Long-term liabilities	0,30	20% x (1 - 0,3)	4,20
Equity	0,55	30%	16,5

Source: The authors own (2013)

2.6 Advantages and disadvantages of EVA®

Saurin *et al.* (2000) believe that all economic performance measure or index have advantages and disadvantages. For these authors, the EVA® is not different. One of its advantages as an economic measure is its usage, since it can be implemented in all types of companies, except for financial institutions, which by regulation build capital reserves.

EVA® also has restrictions as an indicator for companies with intellectual capital assets. According to these authors, today it is clear that businesses have a very different profile from the past, with industries increasingly focused on intellectual capital. For them, this mismatch between practice and income statements causes distortions, which are observed in the equity results by Accounting. Actually, the EVA® based on traditional income statements neglects this change, ignoring the relevance of intellectual capital (Cordioli; Mussi; Saurin, 2000).

Figure 06 illustrates the advantages of adopting an economic measure of Based management system value through EVA®, presented by Stern Stewart & Co.:

Figure 06. Benefits of Adopting the Economic Measure through EVA®
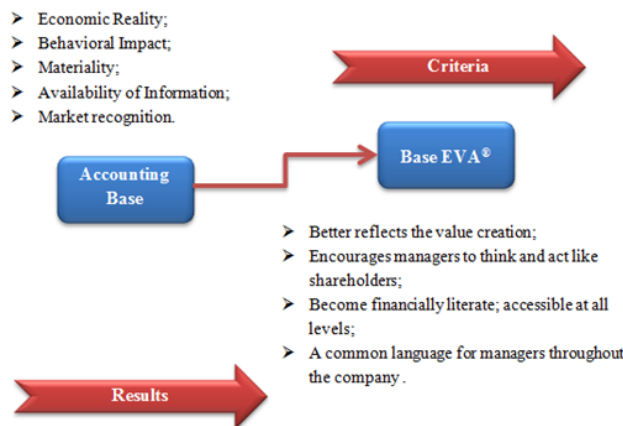
Source: Stern, Stewart & Co (2001)

3. METHODOLOGY

Taking into account the issue and objective proposed, we have chosen an exploratory, document-based study as the investigation method. Hence, some procedures were developed for the collection and processing of data.

Within the exploratory aspect, we used the material available on the Internet, publications on the subject, and specialized technical files, such as: final papers, theses and dissertations, journals and articles, both national and international; Analyze and compare EVA® of several companies that have adopted this methodology through a document-based study, as well as the possible causes of its variations.

To support this choice of method, Gil (2008) defines the types of research according to the objectives below:

• Exploratory research: its primary objective is to develop, clarify and change concepts and ideas based on the formulation of the problem or searchable hypotheses for further studies.

• Descriptive research: describes the characteristics of a given population or phenomena, or the establishment of relationships between variables.

• Explanatory Research: identifies the causes that contribute to the occurrence of the phenomenon.

Therefore, this research was made taking into account the three aspects detailed below:

Descriptive - it describes the evolution, analysis and understanding of the EVA® tool;

Explanatory - it explains the comments and quotes from authors researched and discussed.

Gil (2008) believes that document-based researches are important not because they give answers to a problem; rather, they provide a better insight that leads to hypotheses by other means. According to Gil:

"In connection with this problem, it is worth remembering that some document-based researches are important not because they give final answers to a problem, but because they provide a better view of the problem, or of hypotheses that lead to verification by other means."

The documentation grounding this research was the financial statements of ten companies from the construction industry for the years 2010, 2011 and 2012. All financial statements were taken from the BM&FBOVESPA website. They are divided into consolidated Balance Sheet and Income Statement for the fiscal years above mentioned.

Gil (2008) says that documentary research resembles the bibliographic research. The latter is grounded on the nature of the sources, since it draws on materials which have not yet received analytical treatment, or that need to be redone according to the objects of the research. Besides analyzing "first hand" documents (document from archives, unions, institutions, etc.), there are also those materials that have already been processed, but can still support other interpretations, such as business reports and tables.

Gil then defines the documentary research and its proposition:

I. Set objectives: Specific objectives and hypothesis testing;

II. Prepare the work plan: Survey of issues to be addressed in the documents;

III .Identify sources: Survey of documents;

IV. Locate the sources based on the material used to select the documents;

V. Locate the sources based on the material suitable to the research;

VI. Treat data: Initially run a pre-analysis to select the relevant documents. VII Thus, formulate the hypotheses, and then prepare the material that will ground the analysis. The present research was used as the basis of the financial statements documentary study of ten companies from the construction industry sector, for the years ended 2010, 2011 and 2012, all extracted from the BM & FBOVESPA website. The consolidated financial statements and separate into Balance Sheet and Income Statement were considered in this document analysis.

Gil (2008) documentary research resembles the bibliographic. This occurs in the nature of the sources, since this form relies on materials which have not yet received analytical treatment, or need to be reworked according to the objects of research. In addition to analyzing the documents of "first hand" (document files, unions, institutions etc.), there are also those that have already been processed, but can still receive other interpretations, such as company reports, tables.

In this sense, this research used as evidence base ten companies of Construction, with all these Financial Statements published in the public domain, taken by the author of the BM & FBOVESPA website. In this sense Consolidated Financial Statements were used represented the Balance Sheet and the Income Statement for the financial years 2010, 2011 and 2012 these were considered values of Total Assets, Net Income. For calculation purposes was considered the NOPAT. The WACC has been prepared considering the rate of attractiveness and return compiled by the author, being composed for each year by the composition of the IGP-DI and Selic, studied for years and finally realized the EVA calculation that takes into consideration these variables presented .

4. ANALYSIS OF THE RESULTS

4.2 Determining the Capital, Net Income. Calculation of NOPAT, WACC and EVA®.

Upon the Analysis of Results, it was possible to draw up a summary of the variables studied for the years 2010, 2011 and 2012.

Table 03. Variables by company – 2010

Company	Net Income	Nopat	Wacc	Eva
Brookfield	(388.004)	(242.683)	1.172.131	(1.414.814)
Const A Lind	3.031	4.236	3.300	936
Cr2	(26.540)	(11.834)	76.400	(88.234)
Cyrela Real	778.719	760.564	1.577.039	(816.475)
Direcional	230.167	206.525	345.185	(138.660)
Even	270.564	279.080	430.317	(151.237)
Eztec	338.220	294.368	244.342	50.026
Gafisa	(76.363)	130.577	1.034.376	(903.799)
Helbor	272.116	238.837	393.370	(154.533)
Jhsf Part	184.163	232.296	372.466	(140.170)

Source: The authors own (2013)

Chart 01: Variables for the year 2010
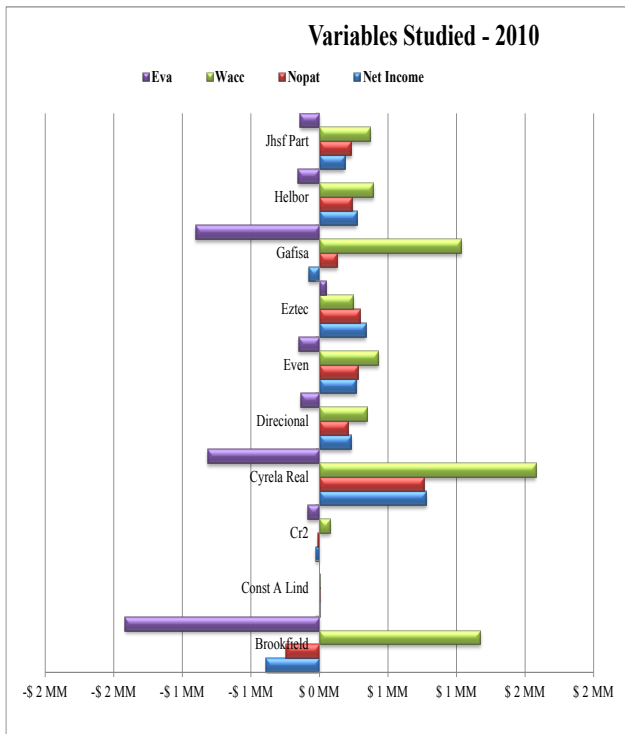
Source: The authors own (2013)

Table 04. Variables by company – 2011

Company	Net Income	Nopat	Wacc	Eva
Brookfield	161.547	334.128	453.515	(119.387)
Const A Lind	(5.142)	(2.314)	1.255	(3.569)
Cr2	13.312	26.035	40.407	(14.372)
Cyrela Real	592.186	542.567	699.801	(157.234)
Direcional	181.590	152.672	125.752	26.920
Even	232.782	219.774	178.946	40.828
Eztec	330.741	266.152	90.998	175.154
Gafisa	(905.189)	(745.286)	487.571	(1.232.857)
Helbor	213.345	176.007	134.903	41.104
Jhsf Part	184.163	232.296	167.523	64.773

Source: The authors own (2013)

Chart 02: Variables for the year 2011
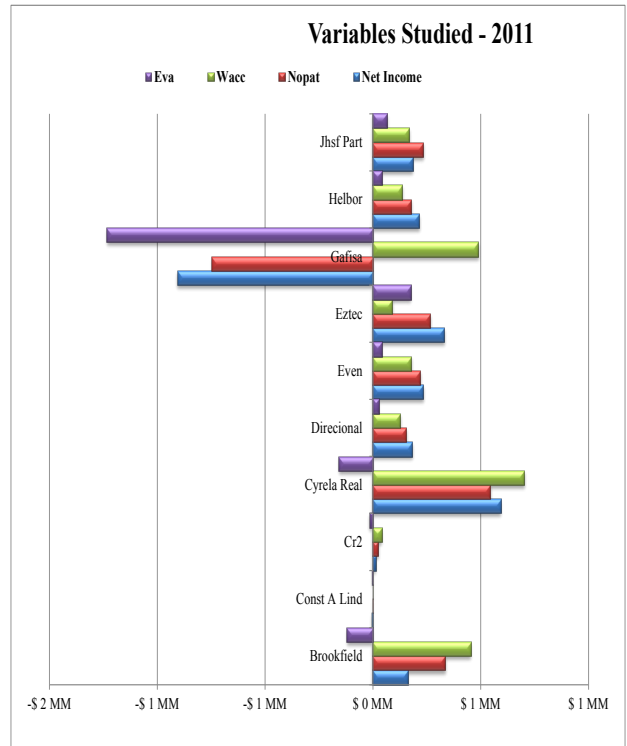
Source: The authors own (2013)

Table 05. Variables by company – 2012

Company	Net Income	Nopat	Wacc	Eva
Brookfield	363.669	480.449	604.168	(123.719)
Const A Lind	(4.698)	520	1.018	(498)
Cr2	54.281	63.495	66.733	(3.238)
Cyrela Real	685.066	619.834	987.092	(367.258)
Direcional	180.442	151.837	137.667	14.170
Even	255.044	267.357	250.872	16.485
Eztec	245.462	204.534	113.235	91.299
Gafisa	288.484	370.601	741.046	(370.445)
Helbor	182.058	149.869	172.066	(22.197)
Jhsf Part	220.769	243.016	208.638	34.378

Source: The authors own (2013)

Chart 03: Variables for the year 2012
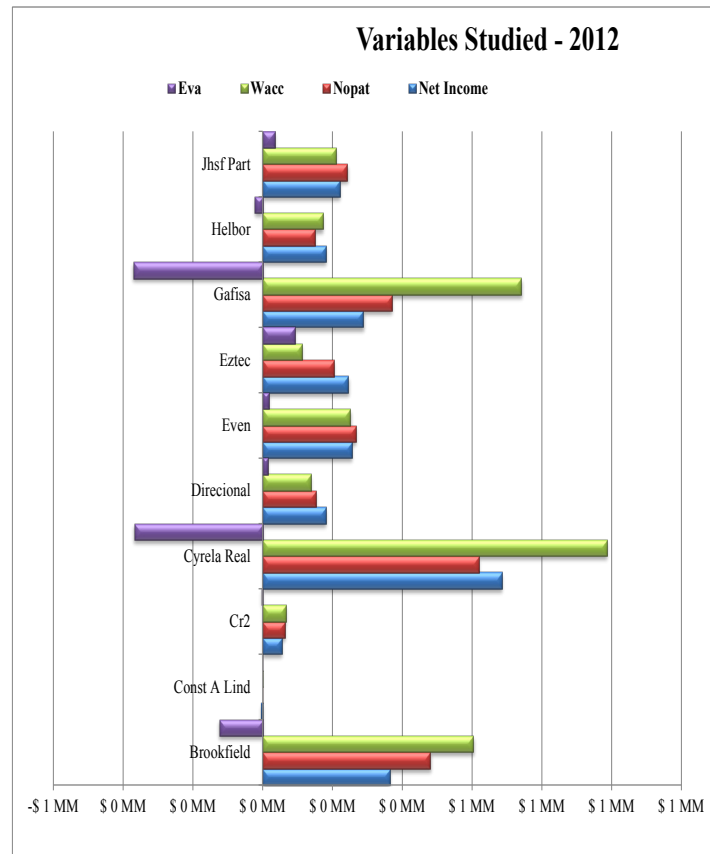
Source: The authors own (2013)

Follows below each one of the variables and their variations for the periods studied:

Variation in Capital according to Table 06 below:

Table 06. Variation in Capital for the years 2010, 2011 and 2012.

Company	Capital			Variation Held (%)		Variation of Capital	
	2010	2011	2012	2011/2010	2012/2011	2011/2010	2012/2011
Brookfield	10.279.040	8.842.604	7.370.875	(14)	(17)	⬇	⬇
Const A Lind	28.943	24.477	12.415	(15)	(49)	⬇	⬇
Cr2	669.990	787.859	814.146	18	3	⬆	⬆
Cyrela Real	13.829.895	13.644.677	12.042.561	(1)	(12)	⬇	⬇
Direcional	3.027.111	2.451.913	1.679.543	(19)	(32)	⬇	⬇
Even	3.773.681	3.489.080	3.060.645	(8)	(12)	⬇	⬇
Eztec	2.142.761	1.774.278	1.381.471	(17)	(22)	⬇	⬇
Gafisa	9.070.994	9.506.624	9.040.791	5	(5)	⬆	⬇
Helbor	3.449.668	2.630.337	2.099.216	(24)	(20)	⬇	⬇
Jhsf Part	3.266.354	3.266.354	2.545.388	-	(22)	⬆	⬇

Source: The authors own (2013)

Variation in Net Income according to Table 07 below:

Table 07. Variation in Net Income for the years 2010, 2011 and 2012.

Company	Net Income			Variation Held (%)		Variation of Net Income	
	2010	2011	2012	2011/2010	2012/2011	2011/2010	2012/2011
Brookfield	(388.004)	161.547	363.669	(142)	125	⬇	⬆
Const A Lind	3.031	(5.142)	(4.698)	(270)	(9)	⬇	⬇
Cr2	(26.540)	13.312	54.281	(150)	308	⬇	⬆
Cyrela Real	778.719	592.186	685.066	(24)	16	⬇	⬆
Direcional	230.167	181.590	180.442	(21)	(1)	⬇	⬇
Even	270.564	232.782	255.044	(14)	10	⬇	⬆
Eztec	338.220	330.741	245.462	(2)	(26)	⬇	⬇
Gafisa	(76.363)	(905.189)	288.484	1.085	(132)	⬆	⬇
Helbor	272.116	213.345	182.058	(22)	(15)	⬇	⬇
Jhsf Part	184.163	184.163	220.769	-	20	⬆	⬆

Source: The authors own (2013)

Variation in NOPAT according to Table 08 below:

Table 08. Variation in NOPAT for the years 2010, 2011 and 2012.

Company	Nopat			Variation Held (%)		Variation of Nopat	
	2010	2011	2012	2011/2010	2012/2011	2011/2010	2012/2011
Brookfield	(242.683)	334.128	480.449	(238)	44	⬇	⬆
Const A Lind	4.236	(2.314)	520	(155)	(122)	⬇	⬇
Cr2	(11.834)	26.035	63.495	(320)	144	⬇	⬆
Cyrela Real	760.564	542.567	619.834	(29)	14	⬇	⬆
Direcional	206.525	152.672	151.837	(26)	(1)	⬇	⬇
Even	279.080	219.774	267.357	(21)	22	⬇	⬆
Eztec	294.368	266.152	204.534	(10)	(23)	⬇	⬇
Gafisa	130.577	(745.286)	370.601	(671)	(150)	⬇	⬇
Helbor	238.837	176.007	149.869	(26)	(15)	⬇	⬇
Jhsf Part	232.296	232.296	243.016	-	5	⬆	⬆

Source: The authors own (2013)

Variation in WACC according to Table 09 below:

Table 09. Variation in WACC for the years 2010, 2011 and 2012.

Company	Wacc			Variation Held (%)		Variation of Wacc	
	2010	2011	2012	2011/2010	2012/2011	2011/2010	2012/2011
Brookfield	1.172.131	453.515	604.168	(61)	33	⬇	⬆
Const A Lind	3.300	1.255	1.018	(62)	(19)	⬇	⬇
Cr2	76.400	40.407	66.733	(47)	65	⬇	⬆
Cyrela Real	1.577.039	699.801	987.092	(56)	41	⬇	⬆
Direcional	345.185	125.752	137.667	(64)	9	⬇	⬆
Even	430.317	178.946	250.872	(58)	40	⬇	⬆
Eztec	244.342	90.998	113.235	(63)	24	⬇	⬆
Gafisa	1.034.376	487.571	741.046	(53)	52	⬇	⬆
Helbor	393.370	134.903	172.066	(66)	28	⬇	⬆
Jhsf Part	372.466	167.523	208.638	(55)	25	⬇	⬆

Source: The authors own (2013)

Variation in EVA® according to Table 10 below:

Table 10. Variation in EVA® for the years 2010, 2011 and 2012.

Company	Eva			Variation Held (%)		Variation of Eva	
	2010	**2011**	**2012**	**2011/2010**	**2012/2011**	**2011/2010**	**2012/2011**
Brookfield	(1.414.814)	(119.387)	(123.719)	(92)	4	⬇	⬆
Const A Lind	936	(3.569)	(498)	(482)	(86)	⬇	⬇
Cr2	(88.234)	(14.372)	(3.238)	(84)	(77)	⬇	⬇
Cyrela Real	(816.475)	(157.234)	(367.258)	(81)	134	⬇	⬆
Direcional	(138.660)	26.920	14.170	(119)	(47)	⬇	⬇
Even	(151.237)	40.828	16.485	(127)	(60)	⬇	⬇
Eztec	50.026	175.154	91.299	250	(48)	⬆	⬇
Gafisa	(903.799)	(1.232.857)	(370.445)	36	(70)	⬆	⬇
Helbor	(154.533)	41.104	(22.197)	(127)	(154)	⬇	⬇
Jhsf Part	(140.170)	64.773	34.378	(146)	(47)	⬇	⬇

Source: The authors own (2013)

4.3 Analysis and Summary of Results determined.

4.3.1 Analysis of Results

Follow below all the variables studied and the analysis developed for purposes of understanding:

Table 11. Variation in EVA® for the year 2010.

Company	Variables Studied - 2010				
	Capital	**Net Income**	**Nopat**	**Eva**	**Wacc**
Brookfield	10.279.040	(388.004)	(242.683)	(1.414.814)	1.172.131
Const A Lind	28.943	3.031	4.236	936	3.300
Cr2	669.990	(26.540)	(11.834)	(88.234)	76.400
Cyrela Real	13.829.895	778.719	760.564	(816.475)	1.577.039
Direcional	3.027.111	230.167	206.525	(138.660)	345.185
Even	3.773.681	270.564	279.080	(151.237)	430.317
Eztec	2.142.761	338.220	294.368	50.026	244.342
Gafisa	9.070.994	(76.363)	130.577	(903.799)	1.034.376
Helbor	3.449.668	272.116	238.837	(154.533)	393.370
Jhsf Part	3.266.354	184.163	232.296	(140.170)	372.466

Source: The authors own (2013)

Table 12. Variation in EVA® for the year 2011.

Company	Variables Studied - 2011				
	Capital	Net Income	Nopat	Eva	Wacc
Brookfield	8.842.604	161.547	334.128	(119.387)	453.515
Const A Lind	24.477	(5.142)	(2.314)	(3.569)	1.255
Cr2	787.859	13.312	26.035	(14.372)	40.407
Cyrela Real	13.644.677	592.186	542.567	(157.234)	699.801
Direcional	2.451.913	181.590	152.672	26.920	125.752
Even	3.489.080	232.782	219.774	40.828	178.946
Eztec	1.774.278	330.741	266.152	175.154	90.998
Gafisa	9.506.624	(905.189)	(745.286)	(1.232.857)	487.571
Helbor	2.630.337	213.345	176.007	41.104	134.903
Jhsf Part	3.266.354	184.163	232.296	64.773	167.523

Source: The authors own (2013)

Table 13. Variation in EVA® for the year 2012.

Company	Variables Studied - 2012				
	Capital	Net Income	Nopat	Eva	Wacc
Brookfield	7.370.875	363.669	480.449	(123.719)	604.168
Const A Lind	12.415	(4.698)	520	(498)	1.018
Cr2	814.146	54.281	63.495	(3.238)	66.733
Cyrela Real	12.042.561	685.066	619.834	(367.258)	987.092
Direcional	1.679.543	180.442	151.837	14.170	137.667
Even	3.060.645	255.044	267.357	16.485	250.872
Eztec	1.381.471	245.462	204.534	91.299	113.235
Gafisa	9.040.791	288.484	370.601	(370.445)	741.046
Helbor	2.099.216	182.058	149.869	(22.197)	172.066
Jhsf Part	2.545.388	220.769	243.016	34.378	208.638

Source: The authors own (2013)

4.3.2 Summary of Results

Follows below the summary developed for purposes of understanding:

The EVA® behaves differently in relation to Net Income mainly due to the fact that it considers the opportunity cost in its calculation basis, or even the weighted average cost, which confirms the understanding proposed by the authors on the WACC and the formula for calculating EVA® (Seoki, 2009; Malvessi, 2000; Ross, Westerfild *et* Jaffe 1995; Morard *et* Balu 2009; Frezatti 1999; Guthrie; 2012; Jung 2008; Paulo, 2003; Tsuji 2006; Liapis, 2010).

When positive, the NOPAT was greater than the Net Income; when negative, as shown in Brookfield and Cr2

examples, the NOPAT was lower than net income. This is explained by the fact that NOPAT does not include the financial results in its composition, thus confirming the understanding of many authors from the bibliography studied in this research (Backes, 2002; Copeland *et al*, 2005; Richard *et al*, 2009).

By partial analysis of each company, it is possible to outline the NOPAT and EVA® of all companies studied for the years 2010, 2011 and 2012 in percentage of ownership. Below are shown the comparisons and explanations obtained through the analysis of tables and charts presented above:

For the year 2010, by analyzing the chart and understanding the table of the composition of variables, only the companies Const. A Land and Eztec have presented

positive EVAs®; the remaining companies from the construction industry presented negative EVAs®.

The EVA® differs from the Net Income as it includes the cost of capital or the opportunity cost, or even the weighted average cost, WACC, in the formula for its calculation, as understood by the authors herein presented with regards to the formula of EVA® and WACC (Seoki, 2009; Malvessi, 2000; Ross, Westerfild *et* Jaffe 1995; Morard *et* Balu 2009; Guthrie; 2012; Jung 2008; Tsuji 2006; Liapis, 2010).

For the year 2011, upon making up Nopat and EVA® values, by analyzing the chart and understanding the table of the composition of variables, only the companies Direcional, Even, Eztec, Helbor and Jhsf Part have presented positive EVAs®; the remaining companies from the construction industry presented negative EVAs®.

The EVA® differs from the Net Income mainly because it includes the cost of capital or the opportunity cost, or even the weighted average cost, WACC, in the formula for its calculation, as understood by the authors herein studied (Seoki, 2009; Malvessi, 2000; Ross, Westerfild *et* Jaffe 1995; Morard *et* Balu 2009; Guthrie; 2012; Jung 2008; Tsuji 2006; Liapis, 2010).

It is worth mentioning that the positive EVA® presented by the companies above detailed is because the calculation of EVA®, which takes into account the opportunity cost or the WACC, weighted average cost. The fact that in theses cases the WACC was smaller than both the Net Income and NOPAT has contributed to a positive EVA®.

This is also explained by the fact that the financial results and other necessary accounting adjustments were left out of the NOPAT calculation, which reinforces the conceptual understanding of the authors studied herein (Stern, Stewart *et* Co, 2001; Backes, 2002; Copeland *et al*, 2005; Richard *et al*, 2009).

For the year 2012, upon making up Nopat and EVA® values, by analyzing the chart and understanding the table of the composition of variables, only the companies Const. A Land, Direcional, Even Eztec e Jhsf Part have presented positive EVAs®; the remaining companies from the construction industry presented negative EVAs®, following the reasoning presented in the global EVA® e NOPAT of companies for 2012, taking into account the level of ownership in the company's equity.

Another fact noticed for this year is that the NOPAT is greater than the Net Income when the latter is mostly positive. This is explained by the fact that the financial results and other necessary accounting adjustments were left out of the NOPAT calculation, which reinforces the conceptual understanding of the authors studied herein (Stern, Stewart *et* Co, 2001; Backes, 2002; Copeland *et al*, 2005; Richard *et al*, 2009).

5. CONCLUSION

The following conclusions can be drawn from this paper: In theory, to determine the EVA® is to determine the Operating Profit (NOPAT) and the company's Capital Invested from the Financial Statements, applying to the last one a cost of capital to find the value that has been added to the capital.

Determining the EVA® of several companies from the construction industry did not simply involve the rearrangement of numbers and formulas from the Financial Statements. It was necessary to adapt them to the EVA® methodology, a complex task in itself that would require several adjustments (One hundred sixty on average).

It is possible to affirm that many companies from the construction industry present most of negative EVAs® in 2010, experiencing an improvement in 2011 followed by a retreat in 2012, as determined in the analysis of results. An annual opportunity cost has been considered for calculation, represented according to Table 14 below:

Table 14. Composition of the interest rate applied

TABLE			
YEAR	IGPM-DI	SELIC	Interest rate applied
2.010	11,3058	0,0973	11,4031
2.011	5,0125	0,1162	5,1287
2.012	8,1121	0,0846	8,1967

Source: The authors own (2013)

A disadvantage for determining the EVA® is related to the difference between the economic and financial environment of the U.S. and Brazil. The EVA® calculation methodology was developed in an environment of low inflation rates, in a simplified tax system and in a high liquidity capital market, i.e., in a context that facilitates its determination. Brazil's framework is quite different, hindering the proper calculation of EVA® as it suffers constant variations due to the country's economic instability.

The great advantage of using this methodology would be to understand the composition of costs for capital generation, and where these costs do not add value to the company.

The Brazilian tax system, especially when it comes to tax incentives, directly affects the way to calculate operating taxes that constitute the calculation basis for the company's NOPAT. As most companies from the construction industry runs businesses in several regions with different tax systems, it was not possible to calculate the operating taxes as suggested by the EVA® methodology.

Determining the cost of capital by the WACC method also involved another series of adjustments. We recommend a value of cost close to the reality of our country, such as the

IGP-DI plus the Selic rate. It is worth noting that we have only changed the costs of capital, however, no alteration was made to its method of calculation, which has remained intact and metrically complete.

The Based management system value used by the EVA® methodology evaluates how much wealth has been generated for a given capital. In this sense, the EVA® can help improve the understanding of what actually is being generated as wealth in companies. This can contribute to improve their performance, since decisions will be made based on information collected on the cost for capital generation.

Through the increasing dissemination of the culture of business and finances throughout the company, employees now have a clearer view of how to improve business performance, highlighting the awareness-raising of employees on the fact that the entire capital employed has an owner, who should manage and pay it accordingly. This evidences to all stakeholders if the proposal used by the systematic is advantageous or not, mainly depending on the type of Company and corporate policies adopted.

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