

## Classification of Growth Opportunities for Brazilian Companies by Sector

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### Introduction

This article presents the results of a mapping of growth opportunities in some Brazilian business sectors. The study was prepared based on the Real - Options Growth Matrix of Smit & Trigeorgis (2004) and Luehrman (1998).

We delimit a classification matrix of companies formed by four quadrants, defined by the Present Value of Growth Opportunities and by the Naïve Net Present Value. Market data relative to companies that have stock negotiated on the Brazilian stock exchange (the São Paulo Stock Exchange - Bovespa) for the years 2005 and 2006 were utilized. The retail, textile, iron and steel, and metallurgy, petroleum and gas, chemicals, telecommunications, foodstuffs and beverages, power and paper and pulp sectors were contemplated.

### Value and Growth Opportunity

Aggarwal (2001, p. 169; 170; 187; 188) and Amram & Kulatilaka (2000, p.9) consider that managerial flexibility represents the ability to alter the strategic direction of the business in response to internal and environmental changes in a competitive and uncertain context. The management flexibilities comprehend the opportunities of expansion or the relinquishing of activities; of putting off or bringing forward investments, to create synergies or reduce losses. In business and projects that operate under conditions of uncertainty, it is possible to measure the

value of the strategic flexibilities, through option pricing models, whose predominant variables include volatility, interest rates, time of duration of the opportunities and dimension of the capital invested. Projects with opportunities for expansion or contraction, of abandonment, postponement, among others, refused due to their negative NPVs, can be feasible when the value of their embedded real options is considered. (Trigeorgis, 1996, p.4-15). In addition, in a context that incorporates management flexibilities and aspects in connection with strategic interaction between agents, the value (expanded or strategic) of a business includes its NPV(naïve), the value of the option representative of managerial flexibility, and the value of the strategic commitment effect. (Smit and Trigeorgis, 2004, p. 13)

According to Smit (1999) and Smit and Trigeorgis (2004, p. 5) in a dynamic environment, strategic adaptability is essential as an appropriate reply to competitive movements. Eventually, the strategic positioning, adaptability and growth opportunities are reflected in the share prices of the companies. Growth shares, such as those of biotechnology, information technology and pharmaceuticals companies, typically presented high price-earnings and price-book value indices. It is precisely the value of intangible assets and growth opportunities that largely determines the market value of high technology shares.

Smit and Trigeorgis (2004, p. 76), based on the BCG (Boston Consulting Group) Matrix and the Option-Value Space of Luehrman (1998), propose the ROG (Real-Options Growth) Matrix. This interesting tool combines the strategic attributes of the Boston Consulting Group model with the presupposed conflicting choice (trade-off) between short-term profit and Luehrman's long-term growth potential.

The ROG Matrix compares the Present Value of Growth Opportunities (PVGO) with the Net Present Value of the business. These two parameters form the Expanded Net Present Value (Expanded NPV = NPV+ PVGO). According to Smit and Trigeorgis (2004, p. 78), the PVGO can be estimated in two ways. The direct and more complex way consists in the adoption of an options pricing model, which requires the identification of individual strategic flexibilities and of the interactions among them and the definition of their parameters. The second method avoids these complexities and uses the "opinion" of the market with respect to the spectrum of strategic opportunities of which the company may avail itself. This indirect method obtains the band of values of the strategic opportunity from the market value of share capital deducted from the "static" value, or the value without share growth, calculated by standard techniques of discount from cash flows.

The ROG Matrix, reproduced below, is divided into six regions that arise from the PVGO x NPV interaction

		<b>NPV</b>	
		-	+
-		<u>Region 6</u> Invest Never	<u>Region 1</u> Invest Now
		<u>Region 5</u> Opportunities with low profitability and low growth potencial	<u>Region 2</u> Profitable projects with low growth potencial
<b>PVGO</b>		<u>Region 4</u> Opportunities with commercialization potencial	<u>Region 3</u> Profitable projects with growth potencial
+			

Figure 1: ROG Matrix (Smit & Trigeorgis 2004, p. 77)

Region 1 indicates that the investment should be made immediately, as the NPV is significantly high and growth opportunities are small or there is little uncertainty in the environment. Region 6 absorbs projects of the type “never-carry out”, as they possess negative NPV and the opportunities for growth or of a change of state in the NPV, are insignificant.

The other sectors lie in regions 2 to 5. Region 2 encompasses profitable projects, but with low growth potential. These projects can be evaluated appropriately through traditional techniques of discount from cash flows, as the real options are of small value. Region 3 is formed by projects with positive NPV (in the money) and growth opportunities. In some cases, they can be more valuable if exercised later. Region 4 unites business with growth potential, but with negative NPV. They are projects that can be good opportunities for investment on future occasions. Finally, there is Region 5 with projects of NPV and growth opportunities both small.

### Mapping of Some Brazilian Industrial Sectors

Based on the BCG and Luehrman approaches, and the Smit & Trigeorgis summary, it was sought to identify the segments with the largest growth opportunities, in the belief that the market can absorb the value of these opportunities (PVGO) in the market price. The following sectors were contemplated: retail (6 companies), textile (13 companies), iron and steel, and metallurgy (23), petroleum and gas (8), chemicals (15), telecommunications (12), foodstuffs and beverages (10), power (21) and paper and pulp (6). The quantity of companies representative in each sector was determined by the availability of data from 2005 and 2006

Our Matrix classified the companies in four sectors delimited by the NPV (if positive or negative) and PVGO (if above or below the average value).

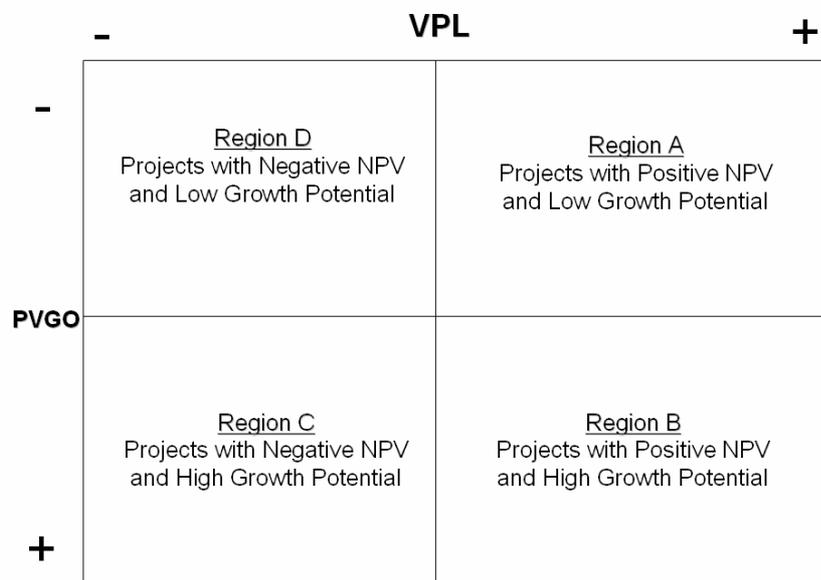


Figure 2 -Simplified ROG Matrix (adapted by the authors)

Region A includes companies with positive NPV and PVGO below average value, which may be those of the “cash cow” type of the BCG Matrix. It is presumed that the traditional sectors, and those with the largest barriers to entering, possess more companies in this area. Region B incorporates companies with high NPV and PVGO. The front line and more dynamic sectors should be represented with more companies in this Region. Region C gathers together companies with negative NPV, but that can be promising in the future for investment. Finally, our Matrix is completed with Region D, which contains companies with negative NPV and low PVGO. Antiquated technology sectors and those in an advanced stage of decline possess more companies within this area.

Data from 2005 and 2006 (when available) were utilized for the classification of the companies in the proposed Matrix. As proxy of the PVGO the difference between (a) the Enterprise Value, calculated by the sum of the market value of share capital with the stock of net debt of the business, and (b) the perpetuity of the EBITDA after tax, discounted by the average weighted cost of the capital<sup>1</sup> was considered.

$$PVGO = EV - \frac{EBITDA \cdot (1-t)}{WACC} \quad (1)$$

$$PVGO = (PL_M + DIV_{Liq}) - \frac{EBITDA \cdot (1-t)}{WACC} \quad (2)$$

For the determination of the NPV the difference between the perpetuity of the EBITDA after tax, discounted by the average weighted cost of the capital, and the book value of the total company assets was used.

$$VPL = \frac{EBITDA \cdot (1-t)}{WACC} - AT \quad (3)$$

The first item on the right side of equation (3) refers to the value of the business, in the *status quo*<sup>2</sup> condition (value without growth), determined from the EBITDA. This condition assumes that CAPEX (Capital Expenditure) is equal to total depreciation and that  $\Delta OpWC$  (*Operational Working Capital Changes*) are nil. Under these conditions and in the long run the EBITDA after taxes converge to the FCFF (*Free Cash Flow to Firm*).

For

PVGO = Present value of growth options

NPV = Naive net present value

EV = Enterprise value

EBITDA = Earnings before interest, taxes, depreciation and amortization.

WACC = weighted average cost of capital

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<sup>1</sup> Our proxy of the PVGO conforms to the criterion of Smit and Trigeorgis (2004, p. 6), that define it as the difference between the market value of the share capital less the perpetuity of net profit, discounted at a risk free rate plus 6% per annum of risk premium.

<sup>2</sup> The *status quo* value is different from the naive NPV concept. The latter can contemplate vegetative growth of the business cash flow, supported by the net investment and working capital increases. The *status quo* value assumes tacitly that the cash flow growth rate is zero and, therefore, the net investment is zero and the working capital is constant.

t = rate of tax (34%)

AT = Book value of total Assets

## Results

We demonstrate in the following graphs the results of the comparison between PVGO and NPV.

### Field: Retail

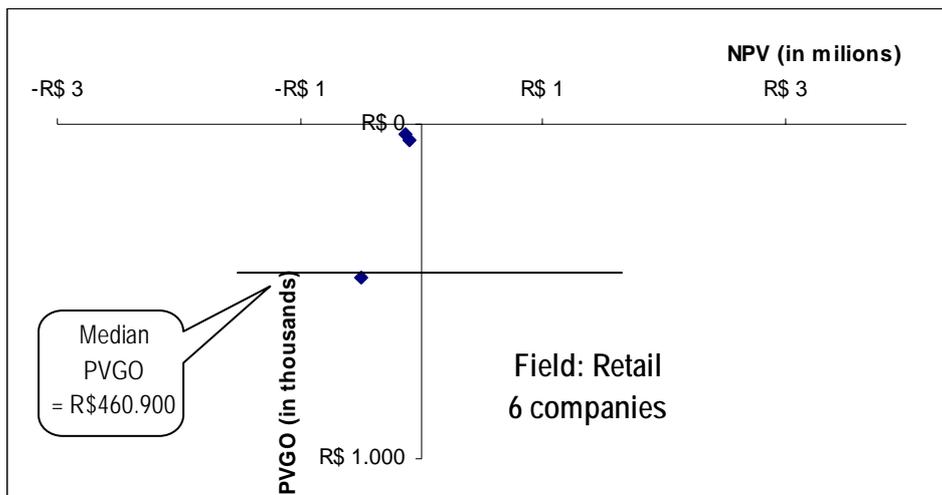


Figure 3

### Field: Textile

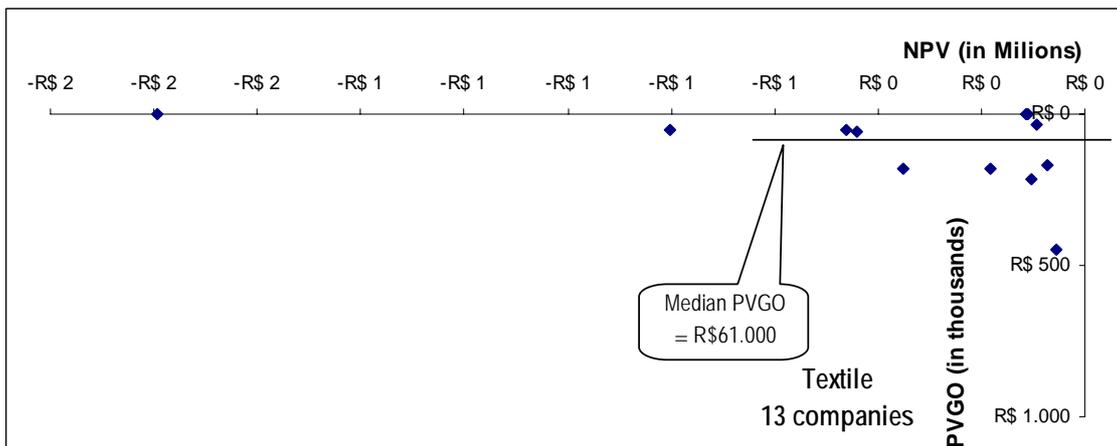


Figure 4

Field: Iron and steel, and metallurgy

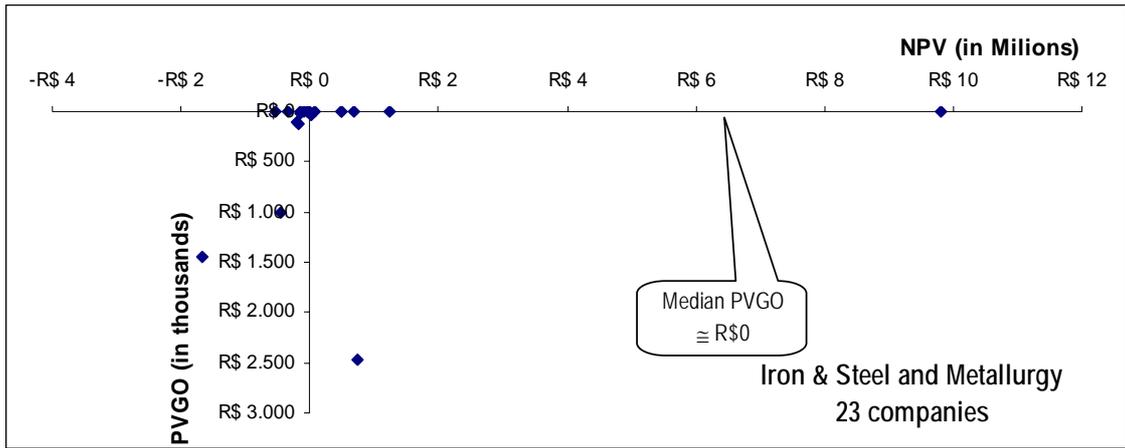


Figure 5

Field: Petroleum and gas

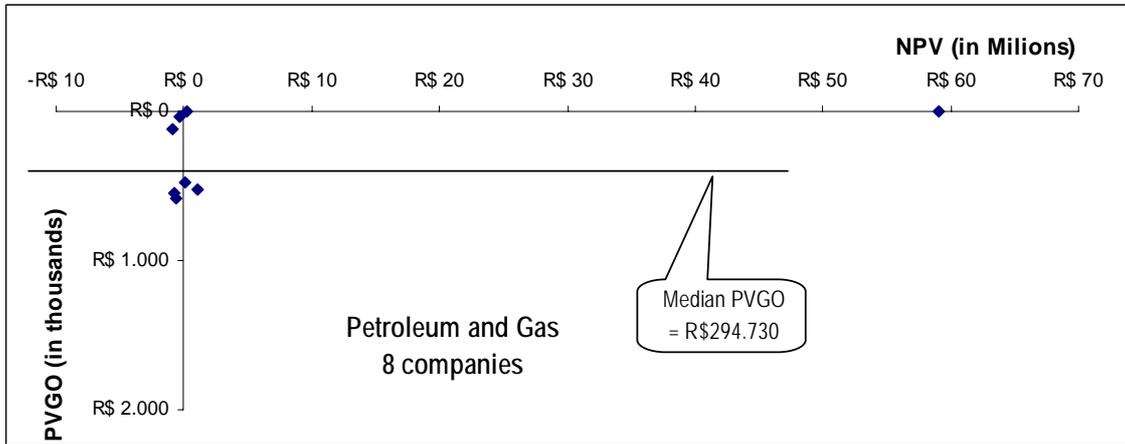


Figure 6

Field: Chemicals

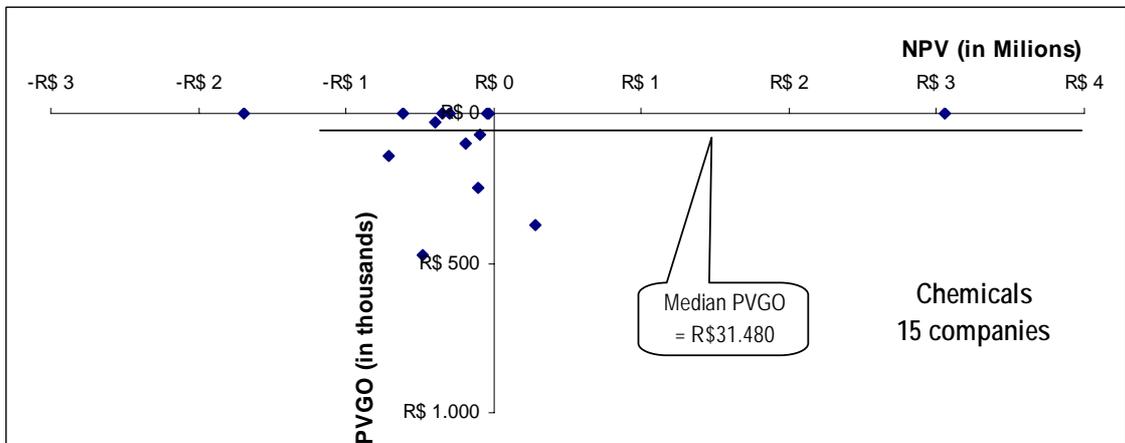


Figure 7

Field: Telecommunications

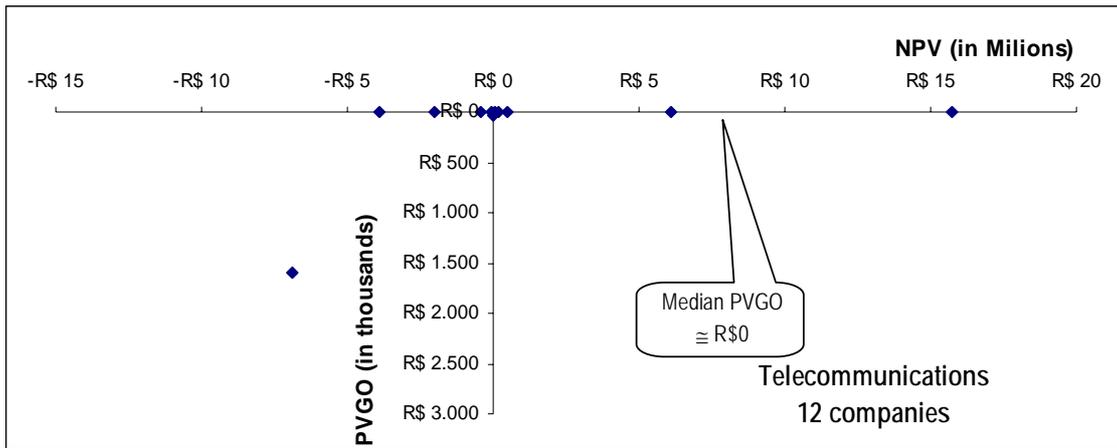


Figure 8

Field: Foodstuffs and beverages

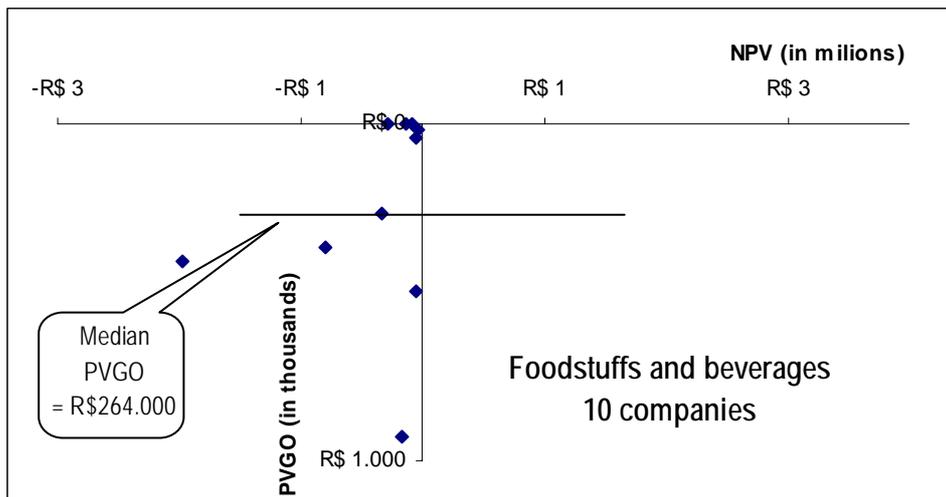


Figure 9

Field: Power

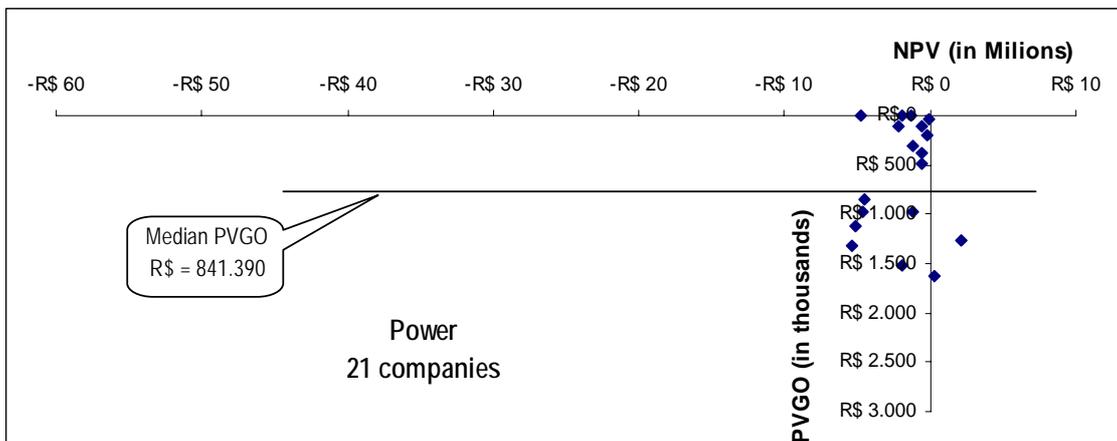


Figure 10

Field: Paper and pulp

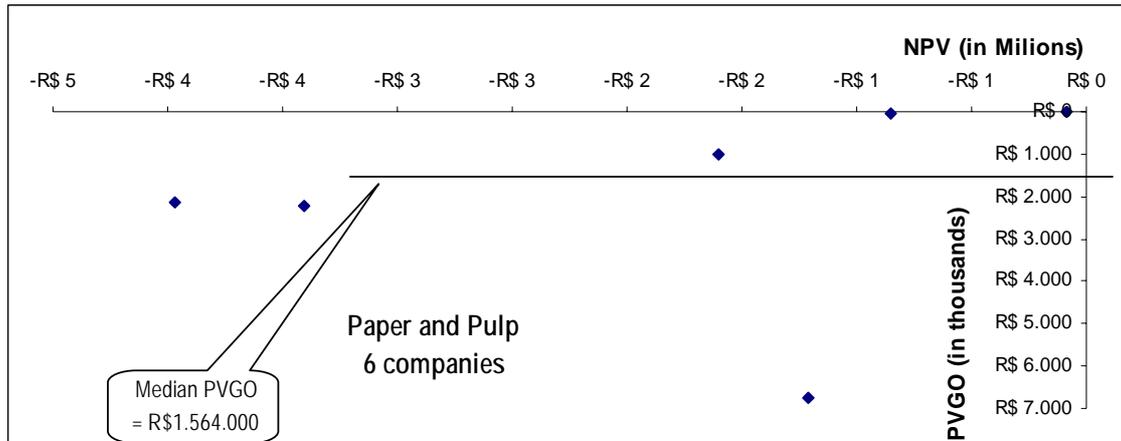


Figure 11

In the first place, we consider that the textile, iron and steel, and metallurgy, paper and pulp, and power sectors are more traditional and possess less intense dynamic technology. The other sectors, retail, petroleum and gas, chemicals, telecommunications, and foodstuffs and beverages evince the largest growth opportunities, because of technology and market dynamics. Adapting the assertion of Smit and Trigeorgis (2004, p.5) on the positive relationship between PVGO and share price to our model of the four regions, we could assume that shares of companies from more dynamic sectors would be classified within regions B and C of Figure 2, through having the largest PVGO. On the other hand, those companies operating in more stable markets and with a less volatile technology, would be located within the regions A and D, because they have share values tied to the norm of long term stable profit generation .

The textile sector revealed a considerable number of companies within regions B and C. It could have been expected that textile companies would be, for the most part, classified in regions A or D, because they are traditional companies. This however is compatible with the fact that despite fierce Chinese competition in the sector, internal demand has been so intense that for some companies it has been hard to meet. The retail sector, today seen as being very dynamic, given the recent innovations in the logistics of the distribution processes, possesses more companies within Region D, which characterizes corporations with market value less than book value and with low growth potential. This result, accordingly, runs counter to the expectation that retail companies, because they are today very dynamic, would occupy the regions B and/or C. Perhaps the explanation here lays on intense competition which makes most growth option non proprietary. The iron and steel and metallurgical sector possesses companies that are

located in regions A and D, as was to be expected, as it is represented by traditional units, with stable technology and markets. Many of the companies in this field are of the "cash cow" type. The telecommunications units, surprisingly, are almost all located in regions A and D, indicating that small growth potential is discerned in this market. The value of the companies is more tied to the perspective of stable profit generation. Again competition is probably the explanation for the findings. The rapid development, for instance of technologies related to VOIP (voice over internet protocol) are a barrier to certain growth options. The chemicals, power, and foodstuffs and beverages sectors possess corporations concentrated in the regions C and D, indicating a certain disparity between companies in these sectors. Our reading of this is that the market identifies distinct growth opportunities for each company of these sectors and not for all of them together. The petroleum sector possesses four companies with NPV and PVGO near zero, indicating market value of the companies equal to book value and with low growth potential; and four companies with NPV also near zero, but with some potential for growth in value.

## Conclusions

Our study has attempted to establish a methodology for the calculation of potential for the growth in value of companies and sectors, inspired by the intelligent trade-off of Smit and Trigeorgis. In applying the method to Brazilian companies, we identified some disparities between the structural characteristics of some sectors and their growth potential. The telecommunications, textile and retail sectors are more evident in this respect. The iron and steel sector presented a mapping consistent with its structural characteristics. Other sectors presented companies with different growth potentials, leading us to believe that the share market determines growth opportunities for each business unit taken individually.

Our approach possesses one weak point that deserves a digression. Some companies studied possess shares of low liquidity, making the prices inelastic to market movements. This low liquidity tends to make the effective pricing of growth opportunities by the market difficult. In any case, it seems that this barrier, represented by low liquidity of some shares of the group studied, makes its presence felt in almost all studies linked to the stock market, but it definitely does not represent a decisive factor or one that invalidates the results. In our particular case, the majority of the companies studied possess significant presence and volume on the floor of the São Paulo Stock Exchange.

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