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DO GROWTH STOCKS GROW FASTER? Empirical Evidence in the Brazilian Stock Market

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1 Introduction

Investment managers and analysts label high (low) book-to-market companies as value (growth) companies. Substantially different growth is expected between the two since the valuation models establish that the firm's value comes from its ability to generate cash flows. Since these cash flows are estimates, much of this value comes from the future films investment opportunities. Because these firms are often at distinct life cycle stages and since the value is a function of future cash flows, there is a conventional wisdom that value and growth stocks grow at noticeably different rates. The question is: is this always true? **Do Brazilian growth stocks grow faster?**

To answer this question, we use correlations, portfolio analysis, and regressions to test the difference in net income and dividends growth. The answer to this question is a contribution to the study of the growth dynamics of firms and the valuation literature. Also, according to Chen (2017), several studies indicate that assets with higher duration are associated with lower returns. These studies show essential explanations for the value effect (Lettau & Wachter, 2007, 2011; Croce, Lettau, & Ludvigson, 2010).

According to Lattau and Wachter (2007), the term structure of equity is downward sloping, so long-duration assets earn lower expected returns. In their model, analogous to long-term bonds, growth firms are high-duration assets while value firms are low-duration assets. Firms with cash flows weighted more to the future endogenously have high price ratios, while firms with cash flows weighted more to the present have low price ratios. Therefore, testing whether growth and value stocks have significant differences in the duration of their cash flows contributes to exposing evidence for this relationship in the Brazilian market.

Our results can be summarized as follows: the overall mean ROE of growth firms is significantly higher than that reported by value firms in almost every year after the portfolios formation. The annual difference in ROE was not significant in the equally weighted portfolios, showing that the profitability of each firm shows little variation in the years after the portfolios formation. Overall, contrary to the results in the US market exposed by Chen (2017), growth companies show higher dividend growth when compared to value companies in Brazil.

The findings have the following practical applications: in the domestic market, growth companies are expected to experience higher dividend growth and higher return on shareholders' equity, confirming the viability of valuation models based on multiples and dividend discount models. Also, conventional wisdom holds that, compared to value stocks, the growth stocks, have substantially higher future cash-flow growth rates and, consequently, longer cash-flow durations.

According to Chen (2017), in the US stock market, the growth stocks do not have substantially higher cash-flow growth rates, and in some scenarios, the value stocks cash flows appear to grow faster. This finding suggests that the duration-based explanation is unlikely to resolve the value premium in the US. However, in the Brazilian stock market, growth companies show higher dividend growth. These findings point to future researches about a possible duration explanation for the value premium.

After this introduction, the remainder of the paper is divided into: (2) the literature review addressing aspects of finance and valuation literature, (3) section about the data and methodology adopted, (4) the section of results, and (5) the conclusion of the study, with the limitations and recommendations for the future research.

2 Do growth stocks grow faster?

The book-to-market ratio is often used to differentiate between growth and value stocks. Generally, when a firm shows a high book-to-market compared to the rest of the companies in the market, we have a value company. When the opposite happens, the company is classified as a growth stock.

Overall, according to the economic literature, the book-to-market is associated with investment efficiency and firm growth. This association derives from the substantial similarity and correlation between the market-to-book ratio and Tobin's *q* (1969) when the latter is generally calculated by the quotient of the market value of a company by the replacement costs of its fixed assets. The replacement costs of fixed assets are given by the capital outlay to repurchase the production capacity for a minimum cost (Famá & Barros, 2000).

The marginal q', is interpreted as a measure of the profitability of new capital investments, defined as the ratio between an additional unit of market value of equity for its replacement cost. In an efficient market, if a company's $q' > 1$, it will maximize its value by investing in profitable projects, until the exhaustion of the projects and resources when the q' will have a value of 1. At a point when $q' < 1$, the firm will do the reverse: it will sell part of its capital stock to rebalance the ratio q' (Tobin, 1969)

Due to this theoretical proposition, in competitive markets, the marginal q' should be close to 1. On the other hand, if the firms have monopoly power or establish entry barriers, there will be scenarios where $q > 1$ – the firm's market value is higher than its replacement cost – indicating returns above the opportunity cost of capital (Lindenberg & Ross, 1981).

Other studies consider the *q* as an indicator of the firms' growth opportunities since firms with high *q* have more incentive to make new capital investments in comparison to those that exhibit a lower *q*. Empirically, consistent with the logic exposed in Tobin's original paper, the M/B ratio reflects the incentives for additional capital investments and an indicator of future growth potential (Famá & Barros, 2000).

In the finance literature, the valuation techniques seek to determine the fair value (in equilibrium) of a firm and its stocks. Generally, according to the rational expectation, the valuation process suggests that the stock price is a function of the expectations of future cash flows discounted by a rate that reflects the required return, the cost of capital. Therefore, *ceteris paribus*, if there are expectations of higher growth in cash flows, the higher should be the shares prices (Damodaran, 2012).

This relationship comes from the normative stock valuation models of classical theory, such as Gordon's dividend discount model, where the price is given by the ratio of future dividends to the cost of capital subtracted from the rate of sustainable growth from the company. The same relation can also be established according to modern models, such as that derived from the third proposition of Modigliani and Miller (1961), where dividends are irrelevant, and the price of shares depends on the investment and growth decisions that increase the free cash flows.

According to the valuation models, when we apply these concepts to the Market-to-book characteristic, M/B (M/B is the inverse of the book-to-market ratio), it is possible to note that the M/B is a positive function of return on equity (ROE), the payout level and the growth of the dividends, and as a negative function of the required rate of return (Damodaran, 2012):

$$M_{i,t}/B_{i,t} = [E(ROE_{i,t}) \cdot E(DPS_{i,t}/EPS_{i,t})]/(k_{i,t} - g_{i,t}) \quad (1)$$

If $g_{i,t} = (1 - E(DPS/EPS)) \cdot ROE$, we have:

$$M_{i,t}/B_{i,t} = [E(ROE_{i,t}) - g_{i,t}]/(k_{i,t} - g_{i,t}) \quad (2)$$

Where:

E is the expected value operator; *M* is the price of the stock *i* at time *t*; *B* is the book value of the stock *i* at time *t*; *DPS* is the dividends per share; *ROE* is the value of return on equity; *EPS* is the earning per share; *g* is the sustainable growth rate of dividends defined by $g = ROE\ (1\text{-}DPS\ /\ EPS)$, and *k* is the required rate of return.

When analyzing growth opportunities, from the perspective of the corporate life cycle, companies that opened recently tend to have higher revenue growth but would still report negative or low growth profits. After the IPO, the companies with the most exceptional growth opportunities would invest more and present higher revenue and profit growth. Later, these companies will enter a period of maturity and exhaustion of most profitable projects, and then will distribute the profits to the shareholders (Miller & Friesen, 1984; Dickinson, 2011).

For Pastor and Veronesi (2003), the market-to-book ratio tends to decrease as companies grow and establish themselves in the market. At this point, there is an increase in information on future profitability, implying that bigger and older companies will have higher book-to-market ratios (value companies). Therefore, according to this view, companies with more significant growth opportunities, which may be associated with growth stocks, would show higher growth in revenues and profits.

Also, the market-to-book ratio grows with the uncertainty about the average profitability of firms and tends to decrease as investors receive more information and learn about future profitability. At this point, according to their valuation model, it is expected that the profitability of companies will show a mean reversion, implying that companies with high (low) profitability – usually growth companies (value) – display a negative (positive) variation over the years (Pastor & Veronesi, 2003).

In empirical research conducted in developed markets, growth stocks have higher ROE, as well as higher stockholders' equity growth, even after five years of their inclusion in portfolios. Also, value companies with high book-to-market, earnings-to-price, and cash-to-price ratios show lower futures net income, while growth companies report persistently higher net income (Fama & French, 1995, 1998, 2006). The authors attribute the higher growth and persistence of return on equity, net income, and revenues as noise proxies for future cash flows, where lower performance and hence less profitable firms (financial distress) would be riskier, suffering a higher discount.

However, according to Lakonishok, Shleifer, and Vishny (1994), growth stocks have high growth in net income, cash flows and revenues. However, after two years, the value stocks shows significant growth in these indicators. The authors attribute the superior returns of value stocks in the US market to the extrapolation of recent growth based on naive investing, making growth stocks substantially more expensive and value stocks cheaper.

In more recent works, Penman, Reggiani, Richardson, and Tuna (2015) show that, after two years of portfolio formation, the value stocks show more significant growth in net income when compared to growth stocks. According to Chen (2017), in annually rebalanced portfolios cash flows from value stocks grow faster than growth stocks. In Buy & Hold portfolios, the cash flows of both types of shares grow indistinctly. The evidence presented by Chen (2017) broadens the understanding of real firm growth and the difficulty of valuation models in capturing expected growth.

Therefore, based on the normative valuation models presented in Equations 1 and 2, and in the empirical evidence set above, we established the following expected relationships: (1) *Ceteris paribus*, companies with lower book-to-market present higher profitability – so, growth companies are more profitable (Fama & French, 1995, 1998; Haugen & Baker, 1996; Chen, 2017); (2) *Ceteris paribus*, companies with higher earnings growth and dividends, present lower book-to-market ratios (Fama & French, 1995, 2006), and (3) Due to their mean reversion, growth (value) companies present negative (positive) future profitability variation (Pastor & Veronesi, 2003).

3 Data

We used the data from two databases: I. We used the Thomson Reuters Eikon to get the accounting and financial data of each firm, and the website of the Brazilian Institute of Geography and Statistics (IBGE) to collect the Brazilian inflation index (IPCA). We selected all companies with available data between December/1997 and April/2017. As a first filter, We dropped financial, insurance and holding companies, since the book-to-market ratio of these companies disagrees with the rest of the sample.

For the portfolios formation, we dropped companies without complete data for the calculation of the book-to-market ratio and with values bigger than 500 or negative. We use the same filters in the regression analysis. As a result, the sample has an average of 140 stocks per year, with a maximum of 199 stocks in the year 2014 and a minimum of 75 stocks in the year 1999. This number represents 24.14% of the firm's population on average.

The variables of interest were: the level of profitability, *ROE*, the annual change on Return on Equity, *ΔROE*, and the growth of dividends *gDIV*. We used the annual change on ROE because the negative net profits could generate distorted results for growth. We deflated all variables related to growth to January 2018 with the IBGE's Consumer Price Index – IPCA and winsorized all values by 2.5% at every year *t* in both tails. The table below summarizes the procedure that we adopted for the variables calculation.

Table 1

Summary of the variables

Variable	Growth Calculation
Book-to-market	*B/M* = (Book Value of Equity/ Market Value of Equity)
Size	*Size* = ln(Market Value of Equity)
Leverage	*Debt* = Total Loans and Financing / Total Capital Invested
ROE	ROE_t = Net $Profit_t$/Book Value of $Equity_{t-1}$
Change in ROE	$\Delta ROE_t = ROE_t - ROE_{t-1}$
Dividend per Share	DPS_t = Dividend $payed_t$/ Number of $Stocks_t$
Dividend growth	$g(DPS) = \ln(DPS_t / DPS_{t-1})$

3.1 Portfolio Formation

To analyze if there is a difference in the growth rates of value and growth stocks, the first part of the analysis consists of the portfolios formation based on the book-to-market ratio. The use of portfolios reduces noise and measurement errors in comparison with individual assets (Blume, 1975). This procedure is standard in asset pricing research and has used by other similar studies, like Fama and French (1995, 1998, 2006), Lakonishok, Shleifer and Vishny (1994) and Chen (2017).

For this research, we adopted a procedure like that described by Chen (2017): in April of each year *t*, from 1998 to 2016, we ranked stocks according to their book-to-market ratio. Then, we formed five portfolios based on the quantiles 20º, 40º, 60º, 80º. Stocks between the 20th and 40th quantiles represent growth stocks. Stocks between the 60th and 80th quantiles represent value stocks. Stocks between the 40th and 60th quantile represents the neutral portfolio. After the portfolio construction, we developed two types of portfolios for each variable analyzed: (i) Equally Weighted Buy & Hold and (ii) Value Weighted Buy & Hold.

Each of the two portfolios has a specific objective: The Buy & Hold portfolios allow the monitoring of the same stocks and the analysis of the variables dynamics over time. This same procedure was adopted by Chen (2017) for the US market, allowing the comparison by the size of the company. Thus, if growth rates are higher (smaller) in equally weighted portfolios, but do not show the same dynamics in market-weighted portfolios, it is possible that big firms show larger (smaller) growth than the small ones.

3.2 Regression Models and Expected Signals

The regression analysis sought to analyze the explanatory power of the book-to-market ratio in the growth of the studied variables. First, we performed univariate and multivariate regressions (controlling for firm size and financial leverage). Thus, we used the non-parametric quantile regression technique, which was adequate in this research considering the data characteristics: the presence of outliers and extreme observations. Also, this estimation is robust for heteroscedasticity, autocorrelation, and non-normality of the errors (Brooks, 2014, Duarte, Girão, & Paulo, 2017).

The first model tested is exposed in Eq. 03, where the primary independent variable of interest is the book-to-market ratio, *B/M*. Also, we added some control variables as the market value of firms, adopted as a proxy for size and financial leverage, which is crucial because the *B/M* is associated with the leverage effect (Bhandari, 1988) and the financial distress (Dichev, 1998).

$$G_{i,t} = \beta_0 + \beta_1 \ln(B/M_{i,t}) + \sum Controls + \varepsilon_{i,t} \quad (3)$$

Where:

G is the growth-dependent variable studied: *ROE*, *ΔROE*, *g(DPS)*; *B/M* is the book-to-market ratio, calculated as set out in Table 1; *ΣControls* is the group of control variables, such as *ln(VM)* given by the market value of the firm's shareholders' equity in June of year *t*, and *Debt*, is the financial leverage ratio, given by the ratio between the liabilities for total capital invested.

Table 2 summarizes the expected signs of the variables and the respective papers that supported them.

Table 2

Summary of Expected Signals

Empirical Model: $G_{i,t} = \beta_0 + \beta_1 \ln(B/M_{i,t}) + \sum Controles + \varepsilon_{i,t}$			
Var. Dependent	**Var. Independent**	**Expected Signals**	**Source**
g(DPS)	ln(B/M)	-	Lakonishok, Shleifer and Vishny (1994); Damodaran (2012)
ROE	ln(B/M)	–	Fama and French (1995, 1998, 2006), Haugen and Baker (1996), Chen (2017).
ΔROE	ln(B/M)	+	Pastor and Veronesi (2003)
g(DPS)	ln(B/M)	+	Lakonishok, Shleifer, and Vishny (1994), Fama and French (1995, 2006), Penman, Reggiani, Richardson, and Tuna (2015), Chen (2017).

4 Results

We split this section into three parts. The first one is descriptive and briefly presents the characteristics of the sample. In the second one we analyzed two types of portfolios: equally and value weighted portfolios. In the last part we conducted a regression analysis.

4.1 Descriptive and Correlation Analysis

Table 3 presents the descriptive statistics of the studied variables. The return on equity (ROE) had the highest number of observations in the study, along with the difference in ROE, leverage and market value. The primary variable of interest, the book-to-market ratio, presented one of the most substantial standard deviations of the sample due to the presence of significant outliers. Therefore, the trimmed mean at 2.5% would be adequate for comparison with other studies that use the variable in Brazil. Thus, the B/M trimmed mean of 0.93, was lower than the average reported by Machado and Cordeiro (2013), between 1995 and 2008, of 1.81, and agrees with the tendency that the book-to-market has been reducing in Brazil, with the predominance of growth companies.

On average, companies showed an ROE of 7%. The annual change in ROE difference was close to zero and corroborate with findings in the U.S. market that profitability is persistent over the years (Fama, 1995; Chen, Novy-Marx, & Zhang, 2010). Regarding the real growth of the dividends, the sample presented minimum and maximum quite high, with mean and median close to zero.

Table 3

Descriptive Measures

Variáveis	NObs	Mean	Apar. (2.5%)[b]	Median	Min	Max	SD
Ln(B/M)	2677	-0.07	-0.07	-0.11	-4.90	4.93	1.15
Ln(VM)	3113	19.79	19.82	19.98	8.61	32.61	2.63
Debt	3159	0.35	0.34	0.36	0.00	1.00	0.26
ROE	3277	0.07	0.09	0.09	-5.15	2.74	0.52
ΔROE	3165	0.00	-0.01	-0.01	-4.34	6.01	0.64
DPS	772	1.25	0.91	0.45	0.00	35.49	2.78
gDPS [a]	492	0.01	0.00	0.00	-7.26	7.29	0.37

Note: [a] g is the annual growth, given by $\ln(DPS_t/DPS_{t-1})$; [b] Trimmed mean at 2.5% on both tails sides

Table 4 shows the Spearman correlation matrix, with the first insights of the association between the studied variables and allows the observation of possible multicollinearity problems in the regression analysis stage. In this sense, this possibility was rejected, since according to Brooks (2014), multicollinearity problems only arise when there are correlations between independent variables higher than 0.8. As reported, in general, the variables presented a low association, especially the negative association between market value and book-to-market. Value companies also had a negative association with the amount of debt per invested capital and the firm's profitability. The firms book-to-market ratio showed a positive and significant correlation with the annual difference in ROE. However, there were no significant results for the dividends per share and its annual growth.

Table 4

Spearman correlation matrix

Variables	ln(B/M)	(2)	(3)	(4)	(5)	(6)
(2) ln(VM)	-0.58 ***					
(3) Debt	-0.19 ***	0.11 ***				
(4) ROE	-0.22 ***	0.20 ***	-0.09 ***			
(5) ΔROE	0.14 ***	-0.01	-0.07 ***	-0.07 ***		
(6) DPS	0.03	0.15 ***	-0.13 ***	-0.13 ***	0.08 **	
(7) gDPS [a]	-0.05	-0.01	-0.09 **	-0.09 **	0.26 ***	0.20 ***

Sig: *** p-value <0.01, ** p-value <0.05, * p-value <0.1. **Note:** [a] g is the annual growth, given by $\ln(DPS_t/DPS_{t-1})$.

Finally, despite being a quick analysis of the existing relations, the Spearman correlation test does not allow more consideration about the behavior and evolution of ROE, ΔROE and the growth of dividends, since the above analysis only compares pairs of variables in the same year *t*. At the same time, it does not allow control over other variables that can influence profitability and growth. The analysis of the portfolios, developed below, seeks to fill these gaps.

4.2 Equally Weighted Portfolios

Firstly, we present the results of the equally weighted portfolios for the *ROE*, *ΔROE* and *gDIV* variables in panels A, B, and C of Table 5. These portfolios consider the same weight for all the stocks, regardless of the market value of each one. We used a t-test to test for the difference between the growth and value portfolios variables.

As shown in Panel A of Table 5, all portfolios had statistically significant returns. By comparing the overall profitability of Growth 5 portfolios (G5) with the overall profitability of Value 1 portfolios (V1), growth stocks are more profitable than value stocks, with a global mean of 9.93%, versus 2.57%, respectively. In the year-on-year comparison between the two extreme portfolios, growth stocks were more profitable than value stocks in almost every year, except for the first year after the portfolio formation. However, only the average of the year 0 (year of portfolio formation) and the second year appears to be statistically significant.

Panel B of Table 5 compares the annual growth of firm profitability. As reported, no portfolio comparison presented statistically different results from zero (except for the second-year *t+2*). These findings corroborate those reported in the US market that profitability is consistent over the years, with no sizeable annual variation per company (Fama & French, 1995; Chen, Novy-Marx, & Zhang, 2010).

Panel C reports the annual growth of dividends per share. The results showed that, in general, dividends of growth stocks grew faster than the dividends of value stocks, with a mean of 2.76% for growth stocks and -0.82% for value stocks, in the five years of portfolio formation. As for the year-on-year comparison, the growth stocks dividends growth was higher than those reported for value stocks. However, the difference between the portfolios was statistically significant only in the first and second years after portfolio formation.

Table 5

Profitability, Change in Profitability and Dividend Growth in B&H Equally Weighted Portfolios

Panel A – Annual and Overall mean of ROE (Equally Weighted)							
Year	The annual mean of ROE					t-Test 5-1	Growth vs. Value
	Growth		Neutral	Value			
	G5	G4	N3	V2	V1		
0	0.0926	0.1305	0.0839	0.0834	0.0210	0.0716 **	0.0594 **

+1	-0.0056	0.0900	0.0896	0.0425	0.0008	-0.0064	0.0205
+2	0.1205	0.1451	0.0740	0.0486	0.0105	0.1100 **	0.1032 ***
+3	0.0987	0.1165	0.1152	0.0394	0.0409	0.0578	0.0674 **
+4	0.1212	0.1259	0.1091	0.0757	0.0425	0.0787	0.0645 *
+5	0.1146	0.1025	0.1322	0.0868	0.0298	0.0848	0.0503
	The overall mean of ROE						
	0.0993 ***	0.1154 ***	0.1031 ***	0.0589 ***	0.0257 *	0.0736 **	0.0609 ***

Panel B – Annual and Overall mean of ΔROE (Equally Weighted)

Year	The annual mean of ΔROE					t-Test 5-1	Growth vs. Value
	Growth		Neutral	Value			
	G5	G4	N3	V2	V1		
+1	-0.0461	-0.0407	0.0030	-0.0436	-0.0025	-0.0436	-0.0203
+2	0.1246	0.0535	-0.0143	-0.0039	0.0000	0.1246 *	0.0909 *
+3	-0.0169	-0.0381	0.0353	-0.0227	0.0157	-0.0326	-0.0235
+4	0.0198	0.0012	-0.0150	0.0249	-0.0127	0.0325	0.0044
+5	-0.0077	-0.0311	0.0131	-0.0093	-0.0289	0.0212	-0.0003
	The overall mean of ΔROE						
	0.0088	-0.0092	0.0039	-0.0132	-0.0056	0.0144	0.011

Panel C – Annual and Overall means of Dividend Growth (Equally Weighted)

Year	The annual mean of Dividend Growth					t-Test 5-1	Growth vs. Value
	Growth		Neutral	Value			
	G5	G4	N3	V2	V1		
+1	0.0238	0.0323	0.0336	0.0019	-0.0134	0.0372	0.0319
+2	0.0468	0.0027	0.0183	0.0148	-0.00825	0.0550	0.0224
+3	0.0203	0.0349	0.0151	0.0039	-0.01600	0.0363	0.0337
+4	0.0338	0.0046	-0.0327	0.0239	0.0002	0.0336	0.0071
+5	0.025	0.0260	-0.0141	-0.0240	-0.0040	0.0290	0.0380 *
	The overall mean of Dividend Growth						
	0.0276 ***	0.0212	0.0053	0.0041	-0.0082 *	0.0358 ***	0.0267 **

Sig: *** p-value <0.01, ** p-value <0.05, * p-value <0.1.

In general, in equally weighted portfolios, growth companies show higher profitability and growth in dividends per share than value stocks. We do not find evidence that the profitability was changed during the five years of stock maintenance.

4.3 Value Weighted Portfolio

The analysis of the value-weighted portfolios aims to detail the role of large companies in stock portfolios. If the results are the same as those reported in the equally weighted portfolio analysis, size is not essential for firm profitability and growth.

In Panel A of Table 6, growth firms showed higher overall profitability, the results hold during all years after the portfolios formation, with an overall mean of 28.87% and 15.85% for the companies of growth and value, respectively.

Panel B reports the annual difference in profitability. As noted, the overall profitability of growth stocks declined -2.60% on average over the five years after the formation of portfolios. The analysis does not allow the assertion that there are significant differences between the two portfolios. Therefore, the findings with the value-weighted portfolios show that the firms with the highest market value contributed to a more significant reduction in the annual portfolios profitability.

Panel C shows the annual growth in dividends per share of value-weighted portfolios. The overall mean value of the Growth portfolio (G5) was 5.44%, versus 1.25% of the Value portfolio (V1). However, only the overall portfolio average (G5) was significant, while all others were not statistically different from zero. These results, when compared to those reported in the equally weighted portfolios, demonstrate that the companies with the highest market value have higher dividend growth, increasing the growth obtained in the extreme portfolios. The same was not observed in the portfolios (G4), (N3) and (V2). These portfolios show superior results in the equally weighted analysis.

Table 6

Profitability, Change in Profitability and Dividend Growth in B&H Value Weighted Portfolios

Panel A – Annual and Overall mean of ROE (Value Weighted)							
Year	The annual mean of ROE					t-Test 5-1	Growth vs. Value
	Growth		Neutral	Value			
	G5	G4	N3	V2	V1		
0	0.2467	0.1575	0.1275	0.0720	0.0584	0.1883 ***	0.0866 **
+1	0.2266	0.1880	0.1021	0.0968	0.0227	0.2039 **	0.1577 ***
+2	0.2924	0.1697	0.1216	0.1130	0.0973	0.1951 ***	0.1358 ***
+3	0.3066	0.1970	0.1167	0.0898	0.1035	0.2031 ***	0.1633 ***
+4	0.2874	0.2166	0.1600	0.1203	0.1237	0.1637 ***	0.1363 ***
+5	0.2852	0.2352	0.2335	0.0969	0.1585	0.1267 **	0.1314 ***
	The overall mean of ROE						
	0.2887 ***	0.1992 ***	0.1409 ***	0.1041 ***	0.0980 ***	0.1907 ***	0.1462 ***
Panel B – Annual and Overall mean of ΔROE (Value Weighted)							
Year	The annual mean of ΔROE					t-Test 5-1	Growth vs. Value
	Growth		Neutral	Value			
	G5	G4	N3	V2	V1		
+1	-0.0076	0.0073	-0.0344	-0.0173	-0.1179	0.1103 *	0.0744 *
+2	-0.0208	-0.0367	0.0159	-0.0151	0.03505	-0.0558	-0.0439
+3	-0.0229	-0.0044	-0.0159	-0.0342	-0.0365	0.0136	0.0203
+4	-0.0534	-0.0062	0.0017	0.0078	0.0761	-0.1295	-0.0855
+5	-0.0205	-0.0025	0.0434	-0.0343	0.2112	-0.2317	-0.1262
	The overall mean of ΔROE						
	-0.0260 **	-0.0105	0.0028	-0.0173 *	0.0046	-0.0697	-0.0327
Panel C – Annual and Overall means of Dividend Growth (Value Weighted)							
Year	The annual mean of Dividend Growth					t-Test 5-1	Growth vs. Value
	Growth		Neutral	Value			
	G5	G4	N3	V2	V1		
+1	0.0919	0.0553	0.0272	-0.0900	0.0111	0.0808	0.113 **
+2	0.0678	-0.0384	0.1291	0.0297	0.0214	0.0464	-0.0108
+3	0.0592	-0.0032	-0.0035	-0.010	0.0260	0.0332	0.0204
+4	0.0459	-0.0465	-0.0187	0.0213	0.0237	0.0222	-0.0228
+5	0.0174	0.0742	0.0533	-0.0301	0.0055	0.0119	0.058
	The overall mean of Dividend Growth						
	0.0544 ***	0.0006	0.0391	-0.0088	0.0125	0.0419	0.0330

Sig: *** p-value <0.01, ** p-value <0.05, * p-value <0.10

Thus, the results presented in the analysis of the portfolios allows some considerations, as listed below:

1. The overall ROE of growth firms is significantly higher than that reported by value firms. The weighting by market value exacerbates the difference between these two types of stocks, indicating that the size of the company is an essential factor in the profitability of these firms;

2. The annual difference in ROE was not significant in the equally weighted portfolios, showing that the profitability of each firm shows little variation in the years after the portfolios formation. However, the difference in profitability was significant in value-weighted portfolios, implying that larger companies have a greater annual reduction in profitability;

3. Growth companies have higher dividend growth in equally weighted portfolios when compared to value companies. At this point, the average dividend growth of value firms was negative in the period studied. In value-weighted portfolios, only the dividends growth of high growth companies' portfolio (G5) were statistically different from zero. The market value increases the relevance of dividends in the extreme portfolios (G5) and (V1), but it is not possible to statistically affirm that growth stocks show higher dividend growth than value stocks in these portfolios;

Figure 2 summarizes the dynamics found in each of the portfolios studied.

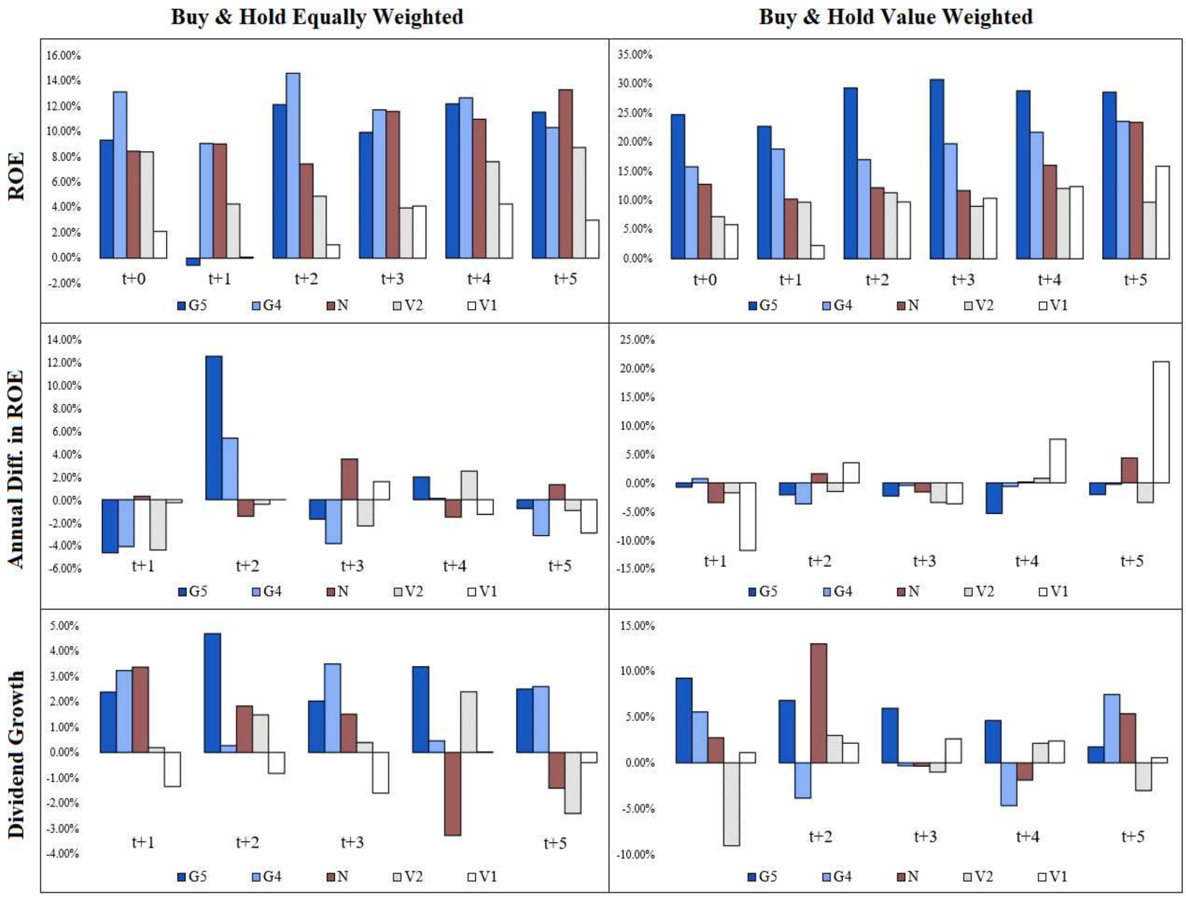

Figure 2. Equally Weighted B&H Portfolios and Value Weighted B&H Portfolios
Source: Prepared by the author with data from Tables 5 and 6.

4.3 Analysis of Regression with Individual Shares

In this section, we present the results of the quantile regressions, whose objective is to test whether book-to-market ratio and size are associated with the level and growth of profitability and the growth of firms' dividends. We show evidence that growth (value) stocks grow faster (slowly) in the analyzed period. The analyses were performed with univariate and multivariate regressions, with each model being estimated with the independent variables in period *t* and period *t-1*.

Also, since the Brazilian market has changed to the adoption of International Financial Reporting Standards (IFRS), it is possible that the analyses carried out in a recent time interval show divergent results from the sample in the complete period. Thus, we split the sample into two periods: using all observations (1997 to 2016) and analysis from 2010 to 2016.

Panel A of Table 7 reports the results for the profitability of individual firms. According to the findings of the univariate analyses, the book-to-market presented a negative relation with profitability at time *t* and *t-1*. The results are robust even if they are controlled by the size of the firms (market value) and the financial leverage. The size and leverage show a significant relationship between positive and negative signals, respectively. In the estimation with the recent sample period, the estimated results of the coefficients are maintained, with the same significance and reported signals.

In Panel B the annual difference in ROE as the dependent variable. In the univariate analyses, book-to-market ratio presented a positive signal, implying that value companies have a more significant positive annual variation in their profitability. In the multivariate regressions, the book-to-market maintained its positive sign in the two sample periods employed. The size and the leverage appear to have a positive and negative sign, respectively. The results are robust to the change in the sample period.

Panel C shows the growth in dividends. In the univariate regressions, the book-to-market presented a negative relation, but the results have a p-value between 5% and 10% and are not significant at *t-1*. When controlling for size and financial leverage, the coefficients lose statistical significance in the whole sample. In the most recent sample period, book-to-market is significant in the same year *t* in the simple and multivariate regressions. Also, the size was not significant, whereas the financial leverage presented a negative sign.

Table 7

Quantile Regression of Growth in Median

Panel A – Dependent variable: ROE								
Sample	Full Sample (1998-2016)				Recent Sample (2010-2016)			
	t	*t-1*	*T*	*t-1*	*t*	*t-1*	*T*	*t-1*
Intercept	0.096***	0.093***	-0.167***	-.096***	0.075***	0.073***	-0.189**	-0.250**
	(28.54)	(24.43)	(-2.61)	(-1.60)	(22.01)	(15.64)	(-2.11)	(-2.44)
log(B/M)	-0.042***	-0.033***	-.024***	-.019***	-0.065***	-0.055***	-0.051***	-0.036***
	(-10.97)	(-8.08)	(-3.64)	(-2.40)	(-11.29)	(-6.67)	(-5.35)	(-2.93)
log(VM)			0.013***	0.009**			0.014***	0.017***
			(4.76)	(3.34)			(3.38)	(3.50)
Debt			-0.096***	-0.049***			-0.144***	-0.130***
			(-5.14)	(-2.45)			(-6.30)	(-4.98)
NObs	2564	2460	2564	2460	1332	1319	1332	1319
Pseudo-R^2	2.72%	1.56%	3.81%	2.03%	4.94%	4.64%	7.63%	4.64%
Panel B – Dependent variable: ΔROE								
Sample	Full Sample (1998-2016)				Recent Sample (2010-2016)			
	t	*t-1*	*T*	*t-1*	*t*	*t-1*	*t*	*t-1*
Intercep	-0.006***	-0.009***	-0.074**	-0.012	-0.015***	-0.017***	-0.134***	-0.123***
	(-3.08)	(-4.47)	(-2.03)	(-0.36)	(-5.21)	(-6.39)	(-3.40)	(-2.92)
log(B/M)	0.012***	0.006***	0.016***	0.006*	0.006**	0.005**	0.015***	0.013***
	(4.87)	(3.24)	(3.91)	(1.63)	(2.29)	(1.88)	(3.34)	(3.09)
log(VM)			0.003**	0.000			0.006***	0.005***
			(2.17)	(0.19)			(3.43)	(2.87)
Debt			-0.042***	-0.011			-0.065***	-0.052***
			(-3.30)	(-0.94)			(-4.01)	(-3.53)
NObs	2466	2378	2466	2378	1332	1319	1332	1319
Pseudo-R^2	0.33%	0.08%	0.60%	0.10%	0.12%	0.07%	1.16%	0.66%
Panel C – Dependent variable: Growth of Dividends								
Sample	Full Sample (1998-2016)				Recent Sample (2010-2016)			
	t	*t-1*	*t*	*t-1*	*t*	*t-1*	*t*	*t-1*
Intercep	-0.008	0.008	0.041	0.127	-0.024	-0.017	0.190	0.151
	(-0.34)	(0.28)	(0.13)	(0.36)	(-0.98)	(-0.58)	(0.47)	(0.40)

log(B/M)	-0.036 *	-0.006	-0.044	-0.024	-0.041**	-0.029	-0.056 *	-0.044
	(-1.69)	(-0.27)	(-1.45)	(-0.87)	(-2.06)	(-1.21)	(-1.74)	(-1.43)
log(VM)			0.001	-0.003			-0.004	-0.004
			(0.11)	(-0.21)			(-0.21)	(-0.24)
Debt			-0.266**	-0.148			-0.395***	-0.227**
			(-2.11)	(-1.32)			(-2.95)	(-1.93)
NObs	492	477	492	477	314	308	314	308
Pseudo-R^2	0.22%	0.01%	0.82%	0.21%	0.60%	0.13%	2.15%	1.14%

Sig: *** p-value <0.01, ** p-value <0.05, * p-value <0.1.

Note: Standard errors obtained by bootstrap with 1500 resampling.

The results obtained here strengthen those of the previous analysis: the positive relationship between growth and profitability firms (ROE) was significant in all periods studied and robust to size and financial leverage. These findings are similar to those reported by Fama and French (1995) and Chen (2017), which present evidence of the profitability superiority of growth companies in the US market.

Diverging from the results of the portfolio analysis that shows no significant differences between value and growth portfolios, the regression analysis showed that value stocks have a positive and significant relationship with the changes in ROE, even when controlled by size and leverage and when restricted to the most recent years of the sample. These findings raise evidence that although less profitable, value stocks show growth in profitability in the year and the next year after observation.

Thus, the theoretical models and the empirical evidence presented by Pastor and Veronessi (2003) regarding the mean reversal of profitability are reinforced, where the high profitability of low book-to-market companies tends to converge to the market. These results explain the positive (negative) relation between value stocks (growth) and the annual variations in profitability. Such a reversal is made explicit in the portfolio analysis of Figure 2.

The findings for dividend growth also expand portfolios results. In the regressions, growth companies (low book-to-market) are related to the growth of dividends per share at the observation year, both in the full sample period and in the recent sample. These findings are like those observed in equally weighted portfolios. However, when we added other controls to the model, the book-to-market coefficients loses significance in the complete sample and are significant only in year *t* with p-value <10%, corroborating with the value-weighted portfolios findings. Even more important, financial leverage is the primary predictor of the dividends growth rate, where firms with higher debt per invested capital have lower dividend growth per share.

5 Conclusion

This study sought to analyze the profitability and dividends levels and growth of value and growth stocks. The rationale for this is based on the common sense of corporate valuation literature that growth stocks grow faster than value stocks, with higher profitability and dividend growth. In the same line, studies sought to evaluate if these conventions are observed empirically showed divergent results.

Our results show that the profitability levels of growth stocks are higher than those of value stocks. These results are confirmed by the analysis of portfolios and by univariate and multivariate regressions. However, the results are not easily observed for the annual profitability difference, since they are only visualized in the regression analyses with individual stocks but are not significant in the portfolios analysis. In the same line, we show evidence that growth stocks have higher dividend growth, with greater importance for the growth of smaller companies.

The results of this research corroborate the findings of Fama and French (1995, 2006) and Chen (2017) for the higher levels of profitability of growth stocks. At the same time, contrary to the findings of Chen (2017), the growth companies show higher dividend growth in the overall mean and the first year after the portfolios formation. At this point, although there was no significant growth difference between the two, at no time did the growth of value stocks exceed the growth of growth stocks.

For practical implications, the results help to estimate the growth rates in the valuation process of companies and stocks. Based on our findings, we recommend caution in the extrapolation of growth rates for the long term, since growth companies showed a mean reversion, as discussed in Pastor and Veronessi (2003). Since the findings of this research contradict those exposed by Chen (2017), the implications of this study are the inverse of the US study: contrary to the results in the US markets, this finding suggests that the duration-based explanation could be a vital factor in resolving the value premium in the Brazilian stock market.

For theoretical limitations, there is a lack of studies about the relationship between growth and value stocks and the growth of profitability and dividends in the local market, making it impossible to compare with other research in the same market. About the empirical limitations, it is possible that the database used does not contain complete and entirely reliable accounting data, which may partially affect the results.

References

Bhandari, L. C. (1988) Debt/equity ratio and expected common stock returns: empirical evidence. *Journal of Finance 43*(2). 507-528.

Blume, M. E (1975) Betas and their regression tendencies. *Journal of Finance 30*(3). 785-795.

Brooks, C. (2014). *Introductory Econometrics for Finance* (3th Edition). Cambridge University Press.

Chen, H. J. (2017). Do Cash Flows of Growth Stocks Really Grow Faster? *The Journal of Finance*, *72*(5), 2280–2330. Retrieved from https://doi.org/10.1111/jofi.12518

Chen, L., Novy-Marx, R., & Zhang, L. (2010). An alternative three-factor model. U*npublished working paper*

Croce, M. M., Lettau, M., & Ludvigson, S. C. (2007), Investor information, long-run risk, and the duration of risky cash flows, *NBER Working paper 12912*, Retrieved from http://www.nber.org/papers/w12912.pdf

Damodaran, A. (2012). *Investment Valuation: Tools and techniques for determining the value of any asset.* 3th Edition. Retrieved from https://doi.org/978-1-118-01152-2

Damodaran, A. (2016). *Narrative and Numbers: The Value of Stories in Business.* 1th Edition. Columbia Business School Publishing.

Dichev, I. (1998). Is the risk of bankruptcy a systematic risk? *Journal of Finance 53*, 1141–1148.

Dickinson, V. (2011). Cash flow patterns as a proxy for firm life cycle. *The Accounting Review 86*(6). 1969-1994.

Duarte, F. C. de L., Girão, L. F. de A. P., & Paulo, E. (2017). Avaliando Modelos Lineares de Value Relevance: Eles Captam o que Deveriam Captar? *RAC – Revista de Administração Contemporânea, 21*(6), 110–134.

Fama, E. F., & French, K. (1993). Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics*, *33*(1), 3–56. Retrieved from https://doi.org/10.1016/0304-405X(93)90023-5

Fama, E. F., & French, K. R. (1992). The Cross-section of expected stock returns. *Journal of Finance*, *47*(2), 427–465. Retrieved from https://doi.org/10.2307/2329112

Fama, E. F., & French, K. R. (1995) Size and book-to-market factors in earnings and returns, *Journal of Finance 50*, 131–155

Fama, E. F., & French, K. R. (1998). Value versus Growth: the international evidence. *The Journal of Finance 53*(6), 1975-1999.

Fama, E. F., & French, K. R. (2006). Profitability, investment and average returns. *Journal of Financial Economics 82*(3), 491–518.

Fama, E. F., & French, K. R. (2015) A five-factor asset pricing model. *Journal of Financial Economics 116*(1), 1-22. https://doi.org/10.1016/j.jfineco.2014.10.010

Famá, R., & Barros, L. (2000). O Q de Tobin e seu uso em finanças: aspectos metodológicos e conceituais. *Caderno de Pesquisas Em Administração*, 7(4), 27–43

Graham, B., & Dodd, D. (1934). *Security Analysis*. McGraw-Hill, New York.

Griffin, John M., and Michael L. Lemmon, 2002, Book-to-market equity, distress risk, and stock returns, *Journal of Finance 57*, 2317–2336.

Haugen, R. A., & Baker, N. L. (1996). Commonality in the determinants of expected stock returns. *Journal of Financial Economics 41*, 401–439.

Lakonishok, J., Shleifer, A., & Vishny, R. (1994). Contrarian investment, extrapolation, and risk. *Journal of Finance 49*, 1541–1578.

Lettau, M., & Wachter, J. A. (2011) The term structures of equity and interest rates, *Journal of Financial Economics* 101, 90–113.

Lettau, Martin, and Jessica A. Wachter, 2007, Why is long-horizon equity less risky? A duration-based explanation of the value premium, *Journal of Finance* 62, 55–92.

Lindenberg, E., & Ross, S., (1981) Tobin's Q Ratio and Industrial Organization, *Journal of Business*, v. 54.

Machado, M. A. V., & Cordeiro, R. A. (2013). Estratégia de valor ou de crescimento? Evidências empíricas no mercado acionário brasileiro. *Revista Brasileira de Gestão de Negócio – RBGN 15*(46). 91-111.

Miller, D., & Friesen, P. H. (1984). A longitudinal study of the corporate life cycle. *Management Science 30*(10). 1161-1183.

Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares, *Journal of Business 34*, 411–433.

Pástor, L., & Veronesi, P. (2003). Stock Valuation and Learning about Profitability. *Journal of Finance 58*(5). 1749-1789.

Penman, S., Reggiani F., Richardson, S. A, & Tuna, I. (2015) An accounting-based characteristic model for asset pricing, *Working paper*, Columbia University.

Tobin, J. (1969). A General Equilibrium Approach to Monetary Theory. *Journal of Money, Credit and Banking, 1*(1), 15–29. Retrieved from http://www.jstor.org/stable/1991374