

# FIRM'S GROWTH DILLEMA: IS IT POSSIBLE FOR A FIRM TO GROW TOO MUCH?

## 1. INTRODUCTION

Increasing the Firm's Growth (FG) is usually one of the most perused firm objectives. However, researches suggests that Firm Growth above the Firm's Financial Capabilities (FFC) can be harmful to the overall Firm Performance (FP). The first objective of this study is to evaluate the effects of a Firm's Growth that surpasses a Firm's Financial Capabilities.

If this hypothesis is true, the companies that manage to have a growth that is above the Competitors Average Growth and below the Firm's Financial Capabilities, the performance should, in theory, reach its peak levels. The second objective of this study is to evaluate if the firms that have optimum levels of growth have the best overall firm performance.

Through multiple analysis on Brazilian public listed companies, we provide evidence of Firm's Growth beyond the Firm's Financial Capabilities having negative impact on the Firm Performance.

We also provide evidence that Firm Performance is at its best levels when the Firm's Growth is above the Competitors' Average Growth (CAG) and below the Firm's Financial Capabilities.

## 2. RESEARCH PROBLEM AND OBJECTIVES

With some researches pointing to the idea that in order to maximize Firm Performance, Firm's Growth has to stay within optimum levels that make the firm competitive in comparison to it's rivals and respect the Firm's Financial Capabilities, this research aims to validate this idea by analyzing Firm Performance as a dependent variable of the Firm's Growth, evaluating the effect of marginal growth above the Competitors' Average Growth and marginal growth above the Firm's Financial Capabilities.

In that regard, we create the first hypothesis, that follows:

**Hypothesis 1** – The firm's performance is impacted by the firm's growth, being positively impacted by growing above the competitors' average growth and negatively by the firm's financial capabilities

The Hypothesis 1 can be segregated in two, considering the two break points that the Hypothesis takes in account:

**Hypothesis 1a** – Growing above the competitors' average growth has a positive impact on the firm's performance

**Hypothesis 1a** – Growing above the firm's financial capabilities has a negative impact on the firm's performance

In complementarity, this research also compares the firm's performance of the firms that has a Firm's Growth within this theoretical optimum interval against their counterparts that fails

to do so, either having sub-optimum levels of growth or excessive growth. Thus, we create the second hypothesis, that follows:

**Hypothesis 2** – The firm will have a peak performance if the firm’s growth is above the competitors’ average growth and below the firm’s financial capabilities

### 3. THEORETICAL APPROACH

#### 3.1.1. FIRM PERFORMANCE

For the firm performance, four performance indicators were used as proxies, being two market performance indicators: the (i) Total Return to Shareholders (TRS); and the (ii) Tobin’s Q. The other two indicators are return based indicator from the firm’s financial statement, those being: (i) the Return over Assets (ROA) and the Return over Equity (ROE).

#### 3.1.2. GROWTH

Following Delmar (1997) approach on firm growth, the sales growth rate was used as a proxy for the Firm Growth (FG), being calculated as:

$$FG = (\text{Sales}_{it} / \text{Sales}_{it-1}) - 1$$

The Competitors’ Average Growth (CAG) is calculated as the expected values for the firm growth for a given BOVESPA subsegment in a given year. In order to analyze the marginal effects of the firm growth above the Competitors’ Average Growth, we created the variable Marginal Competitive Growth (MCG), where  $(FG_{it} > CAG_{it})$  assumes value 1 if the Firm Growth is higher than the Competitors’ Average Growth:

$$MCG_{it} = (FG_{it} - CAG_{it}) * (FG_{it} > CAG_{it})$$

The firm’s financial capability (FFC) is calculated by the Higgins (1977) sustainable growth rate equation, where P is the net profit margin, D the dividend payout ratio, L the debt-to-equity ratio and A the total assets to sales ratio:

$$FFC_{it} = (P_{it} (1 - D_{it})(1 + L_{it})) / A_{it} - (P_{it} (1 - D_{it})(1 + L_{it}))$$

Finally, the Marginal Unsustainable Growth is the marginal growth above the firm’s financial capability, calculated by the following formula, where  $(FG_{it} > FFC_{it})$  assumes value 1 if the Firm Growth is higher than the firm’s financial capability:

$$MUG_{it} = (FG_{it} - FFC_{it}) * (FG_{it} > FFC_{it})$$

### 4. METHODOLOGY

In order to evaluate the effects of the Firm Growth in the Firm’s Performance (**Hypotheses 1**), a series of panel data linear regression analysis on Brazilian public listed companies was used utilizing the Firm’s Performance as the dependent variable having the Firm Growth, the Marginal Competitive Growth and the Marginal Unsustainable Growth as explanatory variables.

For the comparative analysis of the effects of the growth within the optimum levels, the Smart Growth Tunnel (**Hypotheses 2**), the same sample was used and the performance indicators were compared by segregating the companies in three categories: (i) Inside the

Tunnel (Optimum Growth); (ii) Below the Tunnel (Sub-Optimum Growth); and (iii) Above the Tunnel (Excessive Growth).

#### 4.1. SAMPLE

The sample consists in financial data from 287 public listed companies in the São Paulo Stock Market, the B3, from the years of 2010 up to 2020, as 2010 was the deadline year to Brazilian companies to adopt the international accounting standards, making the companies only to be comparable within those years. All data was collected from the Economatica® platform.

Since the Firm Growth is a variable that utilizes data from the previous year, the final sample contained data from 2011 until 2020, summing a temporal space of 10 years). Considering that Economatica® database has missing values for some years in some companies, the final number of observations was 2,253 in total.

#### 4.2. GROWTH LEVEL EFFECTS ANALYSIS AND EXPECTED RESULTS

In order to evaluate the effects of growth above the CAG and the FFC, regression models were constructed having the firm performance as a dependent variable and the Firm Growth, the Marginal Competitive Growth and the Marginal Unsustainable Growth as explanatory variables. The natural logarithm on the firm's total assets was also used as a control variable.

The first step is to validate the **Hypothesis 1a**, that growth above the CAG has a positive effect on the FP.

$$FP_{it} = \beta_0 + \beta_1 FG_{it} + \beta_2 MCG_{it} + \beta_3 \ln(\text{Total Assets}_{it}) + u_{it}$$

For this model, it is expected that  $\beta_1$  presents a positive value, that is, that the company's growth is translated into performance. Furthermore, it is expected that  $\beta_2$  is also positive, that the above-average marginal growth will translate into higher levels of performance.

The second step is to validate the **Hypothesis 1b**, that growth above the FFC has a negative effect on the FP.

$$FP_{it} = \beta_0 + \beta_1 FG_{it} + \beta_2 MUG_{it} + \beta_3 \ln(\text{Total Assets}_{it}) + u_{it}$$

Likewise,  $\beta_1$  is expected to present a positive value, see previous explanation. This time, it is expected that  $\beta_2$  has a negative value, that is, that growth above the company's sustainability level will generate a negative impact on business performance, shareholder return and value creation.

For the final model of the validation of the possibility of the existence of optimum growth tunnel, the **Hypothesis 1**, both models above will be joined, thus generating the final model of the joint test. Predictions remain the same considering the variables tested.

$$FP_{it} = \beta_0 + \beta_1 FG_{it} + \beta_2 MCG_{it} + \beta_3 MUG_{it} + \beta_4 \ln(\text{Total Assets}_{it}) + u_{it}$$

#### 4.3. PERFORMANCE COMPARARION AND EXPECTED RESULTS

Four groups of companies will be created: (i) Optimum Growth – those that have an FP greater than the CAG and an FP lower than the FFC ( $FFC > FP > CAG$ ); (ii) Excessive Growth – those that have an FP greater than the FFC and FFC greater than the CAG ( $FP > FFC > CAG$ ); (iii) Sub-Optimum Growth – Those that have FP lower than CAG and CAG lower than FFC ( $FFC > CAG > FP$ ); and companies (iv) Without Tunnel are those that cannot have Optimum Growth, since the CAG is greater than the FFC, regardless of the FP position ( $CAG > FFC$ ).

The tunnel will not be checked by observation, but rather by the average number of years of each company in each position, considering only companies with at least 5 years of observation. The tuneless companies will not be analyzed as their situation is incomparable as there is no possibility for those companies to be inside Optimum-Growth levels.

The company will be considered Tunneled if RCA is less than the SGR for at least 40% of the time period, otherwise it is considered Tunnelless and classified as such. In mathematical terms:

$$\text{Without tunnel} = (\text{Years with tunnel} < 0.4 * \text{Years without tunnel})$$

The tunneled company will be considered in optimum growth if it spends at least 80% of the total time in Sub-optimum Growth or in Excessive Growth in Smart Growth. In mathematical terms:

$$\text{Optimum Growth}_i = (\text{Years with Tunnel} > 0,4 * \text{Years without Tunnel}) * [(\text{Years in Optimum Growth}_i > 0,8 * \text{Years in Sub-Optimum Growth}_i) * (\text{Years in Optimum Growth} > 0,8 * \text{Years in Excessive Growth}_i)]$$

If the company with tunnel does not present Smart Growth and is more years in Excessive Growth than in Sub Growth, it will be considered Excessive Growth and vice versa. In mathematical terms:

$$\text{Excessive Growth}_i = (\text{Years with Tunnel} > 0,4 * \text{Years without Tunnel}) * (\text{Years in Excessive Growth}_i > \text{Years in Sub-Optimum Growth}_i)$$

$$\text{Sub Growth}_i = (\text{Years with Tunnel} > 0,4 * \text{Years without Tunnel}) * (\text{Years in Sub-Optimum Growth}_i > \text{Years in Excessive Growth}_i)$$

It is expected that the average performance of companies in Optimum Growth is higher than that of companies outside this situation, especially in relation to companies in a Sub Growth situation.

If this is the case, it will be possible to infer that being inside the Optimum Growth tunnel is a competitive advantage since it is the return range for the company's growth, whether internal or for the shareholder, and higher market value compared to value assets as recorded in the accounting.

## 5. RESULTS ANALYSIS

### 5.1. REGRESSION ANALYSIS

In all models using market performance, the results of the Hausmann tests were not significant ( $p > 0.05$ ) and, therefore, the Random Effects (RE) model was used in all cases. The models also showed heteroscedasticity and residual autocorrelation, so the models are also presented using Robust Regression (RE, ROB) and in the Robust Feasible Generalized Least Squares model (FGLS, ROB).

**Table 1** – TRS and Tobin's Q Regression Analysis

Variables Model	TRS FGLS, ROB	TRS FGLS, ROB	TRS FGLS, ROB	Tobin's Q FGLS, ROB	Tobin's Q FGLS, ROB	Tobin's Q FGLS, ROB
$\ln(\text{Total Assets}_{it})$	1.608*** (0.402)	1.628*** (0.399)	1.628*** (0.403)	-0.0235*** (0.00442)	-0.0242*** (0.00443)	-0.0226*** (0.00441)
$FG_{it}$	4.624***	1.003***	5.136***	0.0801***	0.0106***	0.0871***

	(1.289)	(0.316)	(1.317)	(0.0142)	(0.00310)	(0.0142)
MCG <sub>it</sub>	5.924***		5.764***	0.101***		0.0999***
	(1.753)		(1.781)	(0.0184)		(0.0181)
MUG <sub>it</sub>		-0.693**	-0.634**		-0.00833***	-0.00797***
		(0.300)	(0.307)		(0.00244)	(0.00238)
Constant	-13.08**	-13.07**	-13.09**	1.011***	1.040***	1.004***
	(6.150)	(6.088)	(6.166)	(0.0701)	(0.0700)	(0.0700)
Observations	2,253	2,253	2,253	2,253	2,253	2,253
Number of Companies	287	287	287	287	287	287

Standard Errors in Parenthesis

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Elaborated by the Authors

In the models using ROA, there were no differences in the Hausmann, Heteroscedasticity and Residual Autocorrelation tests compared to the previous item. Thus, the Random Effects (RE), Robust Regression (RE, ROB) and Robust Feasible Generalized Least Squares (FGLS, ROB) models were used.

**Table 2 – ROA Regression Analysis**

Variables	ROA	ROA	ROA
Model	FGLS, ROB	FGLS, ROB	FGLS, ROB
ln(Total Assets <sub>it</sub> )	0.0267***	0.0229***	0.0281***
	(0.00105)	(0.00117)	(0.00102)
FG <sub>it</sub>	0.0233***	0.000663	0.0230***
	(0.00391)	(0.000885)	(0.00401)
MCG <sub>it</sub>	0.0315***		0.0298***
	(0.00518)		(0.00525)
MUG <sub>it</sub>		-0.000888	-0.000682
		(0.000604)	(0.000557)
Constant	-0.391***	-0.331***	-0.413***
	(0.0167)	(0.0185)	(0.0161)
Observations	2,253	2,253	2,253
Number of Companies	287	287	287

Standard Errors in Parenthesis

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Elaborated by the Authors

For the models using ROE, there were significant Hausmann test results ( $p < 0.05$ ) in the second equation test and in the joint test and, therefore, the Fixed Effects (FE) and Robust Fixed Effects (FE, ROB) models were used in these cases, together with the Robust Feasible Generalized Least Squares (FGLS, ROB) model due to residual autocorrelation and heteroscedasticity.

**Table 3 – ROE Regression Analysis**

Variables	ROE	ROE	ROE	ROE	ROE
Model	FGLS, ROB	FE, ROB	FGLS, ROB	FE, ROB	FGLS, ROB
ln(Total Assets <sub>it</sub> )	0.0113***	0.0279	0.0121***	-0.0560	0.0124***
	(0.00136)	(0.0203)	(0.00162)	(0.0739)	(0.00160)
FG <sub>it</sub>	0.0251***	0.281***	0.139***	0.267***	0.152***
	(0.00524)	(0.0841)	(0.00866)	(0.0898)	(0.0124)
MCG <sub>it</sub>	0.0356***			-0.0354	0.0184

MUG <sub>it</sub>	(0.00737)	-0.283***	-0.140***	(0.0962)	(0.0131)
		(0.0843)	(0.00849)	(0.0840)	(0.00857)
Constant	-0.122***	-0.245	-0.0483**	1.019	-0.0539**
	(0.0215)	(0.324)	(0.0238)	-1.106	(0.0235)
Observations	2,253	2,253	2,253	2,253	2,253
Number of Companies	287	287	287	287	287

Standard Errors in Parenthesis

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Elaborated by the Authors

In general terms, we can say that the Hypothesis 1 has been validated since, in a systematic approach, it was possible to observe a positive significant effect of growing above the MCG (Hypothesis 1a) and a negative significant effect of growing above the FFC (Hypothesis 1b).

Some problems occurred with the models for ROA and ROE. In the ROA, the MUG had no significance in any model. For the ROE, it can be seen that the variable MCG lost significance due to the use of the fixed effects model. Even so, considering the results of the individual tests, the overall results considering a systematic approach remains the same.

## 5.2. PERFORMANCE COMPARASION

The final result of the classification is in Table 4:

**Table 4 – Classification Results**

Classification	Companies	Percentage	Cumulative
Optimum Growth	40	17,02%	17,02%
Sub-Optimum Growth	51	21,70%	38,72%
Excessive Growth	12	5,11%	43,83%
Tuneless	132	56,17%	100,00%
Total	235	100,00%	100,00%

Source: Elaborated by the Authors

It is possible to note that Optimum Growth is not a possibility for all Brazilian companies, given that 56.17% of them do not have this tunnel where FFC is greater than CAG. Even so, a significant number of companies, 43.83% may be within this range, even if they do not.

Thus, the performance of companies within these categories is analyzed through Tables 5 and 6. In almost all cases, it can be seen that being within the Optimum Growth tunnel gives the company the best levels of return and performance market.

**Table 5 – Firm Performance Comparison**

Firm Performance	TRS	Tobin's Q	ROE	ROA	%Companies
Inside the Tunnel	<b>17,9</b>	<b>90,66%</b>	<b>3,70%</b>	<b>0,80%</b>	17,02%
Outside the Tunnel	11,73	66,04%	-3,43%	-14,01%	26,81%
Average Performance	14,13	75,60%	-0,66%	-8,26%	43,83%

Source: Elaborated by the authors

**Table 6 – Firm Performance Comparison**

Firm Performance	TRS	Tobin's Q	ROE	ROA	%Companies
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Optimum Growth	<b>17,9</b>	<b>90,66%</b>	<b>3,70%</b>	0,80%	17,02%
Sub-Optimum Growth	12,6	64,03%	-4,97%	-18,95%	21,70%
Excessive Growth	8,07	74,59%	3,13%	<b>6,99%</b>	5,11%
Average Performance	14,13	75,60%	-0,66%	-8,26%	43,83%

Source: Elaborated by the authors

The only case in which the hypothesis that being inside the Smart Growth tunnel gives the best results does not seem to be confirmed is for the ROA, especially for Table 6. However, when returning to the linear regression results, especially the test as a whole, remember that the ROA does not have an upper limit, that is, it is not affected if the FP is greater than the FFC.

Even so, although this penalty does not exist, if the company has the FP at levels higher than the FFC, all other performance metrics tend to be worse than in other situations. In this way, it can be understood, based on this systemic view, that being inside the Smart Growth tunnel is the best decision that companies can make if this is possible. In this regard, the Hypothesis 2 was confirmed.

## 6. CONCLUSION

In this research, we provide evidence that growing above a firm's financial capabilities can have a negative impact on the firm's performance, as multiple performance indicators tend to decrease after reaching this sustainable growth levels, but growing above the average competitor's growth is a necessity.

Staying inside the optimum growth tunnel tends to maximize the overall firm performance, considering the chosen performance measures. Despite being a possibility for only 43% of the Brazilian companies, the 17% that stays within this interval have the best overall performance.

## 7. REFERENCES

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