Shareholder Value Creation at Excessive Growth Levels: Empirical Evidence from Turkey

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ABSTRACT

In this study, to determine value creation rates at high and moderate growth levels, 8 years data of 167 non-financial companies of Borsa Istanbul is employed in a panel data analysis. The study found that growing significantly above sustainable growth rate is systematically associated with value destruction. It is also demonstrated that shareholder return is a concave function of firm growth, proposing an optimal point of sales growth beyond which further growth destroys shareholder value.

Key Words: Value Creation, Firm Growth, Sustainable Growth Rate, Sales growth

Aşırı Büyüme Seviyelerinde Hissedar Değeri Yaratmak: Türkiye Örneği

ÖZ

Bu çalışmada, hızlı ve makul büyüme oranlarının hissedar değeri yaratma hızlarını belirlemek amacıyla, Borsa İstanbul'da işlem gören finans sektörü dışında kalan 167 şirketin 8 yıllık mali

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bilgileri panel veri analizinde kullanılmıştır. Sürdürülebilir büyüme oranı üzerindeki büyümenin sistematik olarak hissedar değerini azaltıcı etki yarattığı belirlenmiştir. Ayrıca, toplam hissedar getirisinin, büyümenin içbükey (konkav) bir fonksiyonu olduğu, belirlenen optimal noktanın üzerindeki satış büyümelerinin hissedar değeri üzerinde azaltıcı etki yarattığı gösterilmiştir.

Anahtar Kelimeler: Değer Yaratma, Firma Büyümesi, Sürdürülebilir Büyüme Oranı, Satış Büyümesi

1. INTRODUCTION

Although growth and profitability are accepted as two major components of widely consented objective of the firm, shareholder value creation, the collapse of fast grown prominent companies over the course of last few decades generated some skepticism regarding the value created by rapid growth. Besides, the widespread belief that by expanding the size (revenues, assets, employment etc.), firms create value for the shareholders at all levels of growth, is not supported by sufficient empirical evidence. Rapid growth brings financial strain and makes it difficult for the firm to sustain its successive growth. Long-lasting growth is only possible when it is backed with sufficient internal cash generation or with capital injection, provided that other resources of the firm are sufficient to support such expansion.

Given the importance of growth for the firm, understanding the relationship between fast or high growth and value generation is particularly important in finance. In order to bring a viable limit for the growth of the firm, several different models are developed by finance scholars (Higgins, 1977; Higgins, 1981; Varadarajan, 1983; Johnson 1981). However, Higgins' model is the most recognized and extensively used one. The idea behind the widely known "sustainable growth rate" (SGR) model (Higgins, 1977) is that assets required for the additional sales should be financed by the retained profit and the additional debt capacity of the growth without changing the financial leverage of the firm.

This study basically elaborates the topic of value creation at excess growth levels, which is defined as the growth above sustainable growth rate by this study. The rest of the paper is organized as follows: Section 2 gives an overview of the literature, section 3 describes the data selection and methodology, section 4 presents the empirical results and section 5 concludes.

2. Literature Review

For a firm to grow in value while growing in size, it must have investment opportunities with positive net present values available. Therefore, key question during the growth process is whether the return on equity in new investments is above or below the cost of equity. If return on equity is above cost of equity, then anticipated growth will create value. When return on equity is less than cost of equity, this will surely result in value destruction.

Studies confirmed the role played by expectations in shareholder value creation process (Kasznik and McNichols, 2002; Varaiya *et al.* 1987). They verified that abnormal annual returns are significantly greater for firms meeting expectations, and that, market assigns higher values to firms that meet or exceed expectations consistently. Another study (Markman and Gartner, 2002) made on 500 hyper-growth firms in United States, exhibited that growth is not related to firm profitability. Additionally, Lintner (1964) suggested that maximizing the expected value of shareholders' equity does not necessarily imply maximizing expected growth rates as generally assumed. These studies actually imply that growth and value relation may be weaker than it is generally presumed.

Lang *et al.*(1996) proposed a negative relation between leverage and future growth for low Tobin's q firms. In other words, the study suggested that leverage restricts growth only for those firms whose growth opportunities are not valuable enough or recognized by the market. Leverage does not seem to reduce growth for firms which have good investment opportunities.

Davidsson *et al.* (2009) suggested "profitability first" rather than "growth first" as the preferable strategy based on SME (small and medium sized enterprises) studies in Australian and Swedish

firms. They have found no empirical evidence for the existence of profitability advantages due to the growth of sales revenues. According to their study, firms at low levels of profitability are not likely to achieve high profitability by expanding their sales volume. Their study is extended by controlling for firm type and leverage and tested on Turkey's top 1000 firms and revealed a similar result. Low growth and high profitability firms generally had greater probability of becoming a high growth firm, compared to high growth-low profitability firms (Yıldırım, 2011).

Fuller and Jensen (2002) contend that Wall Street companies stretch their targets to meet the expectations' of analysts. However, the expectations for high growth can impose real and lasting costs on companies, especially when the level of expectation is significantly above what is possible for firms to accomplish. Inspired by the Fuller & Jensen's paper Ramezani *et al* (2002) examined the relationship between growth and firm performance. They measured the corporate profitability by EVA (Economic Value Added), ROE (Return on Equity) and ROI (Return on Investment). Using multivariate analysis, they showed that while these measures generally increased with sales growth, an optimal point existed beyond which further growth destroyed shareholder value and adversely effected profitability. They revealed that moderate growth in sales provided the highest rates of return and value creation for the shareholders. The coefficients they found implied an existence of a growth rate where EVA was maximized. They concluded that *"maximizing growth is not necessarily consistent with maximizing shareholder wealth. That is, shareholder value is a concave function of growth".*

The growth and value adding mechanism is not completely disclosed yet. One expects that, growth in firm's earnings should result in higher company value. However, as suggested, sales growth above what is "technically" viable can bring real and lasting problems as well as increasing the systematic risk of the company by changing the leverage, and increasing earnings volatility. So, the question is, what should be the targeted growth or the limit of growth to optimize value created in the growth process? As

suggested by different studies, too much growth (beyond certain level) may have negative impact on financial performance. Therefore, growth for companies should not be a goal but instead a tool for maximizing shareholder value. Although it looks as if a direct link exists between revenue growth and equity value, un-restrained growth may be hindering the ultimate goal of the firm, maximizing shareholder value, instead of serving to it. In most circumstances, growth requires extra financing which can be provided both by internal and external sources. The availability and the extent of these sources are the limiting factors of firm's growth. A firm growing too fast may be over-using its available financial sources. This may jeopardize the sustainability of growth and endanger firm's survival in the long run.

The SGR (Sustainable Growth Rate) is a growth strategy based on two main assumptions. The first is that sales of a company can grow only as fast as its assets. The second assumption is that, consistent with the Trade-off Theory firm has a target debt equity ratio and that the lenders are willing to continue to extend credit at that ratio. This assumption implies that as the equity grows, debt can grow at the same rate to allow maintaining a constant debt equity ratio. Firms generally dislike issuing equity (increasing capital) because of unwillingness of shareholders, possible dilution of shares and high issuance costs. A firm can only increase financial leverage if its debt equity ratio has some margin for further leverage increase. Myers and Majluf (1984) identify this margin as 'financial slack'. The reduction of dividends will not be preferred by the shareholders and it will have negative impact on the company's stock price.

In his standard SGR model Higgins (1977) treats firm's growth rate not as an independent variable, but rather as one of several variables in an interdependent system. In the standard model, depreciation is just sufficient to maintain the value of existing assets. Also, it is assumed that the profit margin on new sales and the ratio of assets to sales on new sales are equal to the average of the same on existing sales.

All versions of SGR equations used by researchers suggest the same. Unless new equity issued, a firm can increase its SGR, only by improving its operating performance (through increasing profitability or increasing asset turnover), by reducing the cash flowing to shareholders or by increasing its leverage. However, increasing leverage will also increase the risk borne by the firm.

A future-looking study (Lockwood and Prombutr, 2010) which examined the relations between stock returns and sustainable growth rates found that firms with high sustainable growth rate, on average, tend to have low BE/ME (Book Equity/Market Equity) and low default risk. Amouzesh *et al.* (2011) investigated the deviation of actual growth rate from sustainable growth rate. Their results exhibited a significant association between the deviation of actual growth rate from sustainable growth rate and ROA and ME/BE ratios.

Growth above sustainable growth rate (SGR) is often unintended, unplanned growth. Those over-growing companies are forced to retain all of the generated profit and forced to cut their dividends. Dividend cuts are often perceived negatively by the market. Besides, profit level is not expected to improve during hyper-growth periods as these firms are aggressively increasing market share or building a new market. Thus, unplanned overgrowth above the sustainable growth rate requires supplementary financing. This extra financing mostly comes from short-term debt, which increases the riskiness of the firm, and end up in value decrease.

3. Data and Methodology

A firm's growth is determined by a complex system of variables, but mainly depends on its re-investment rate and its return on these investments. Investments include acquisition of new fixed assets, new companies, as well as investments in marketing capabilities and distribution channels.

In a backward looking study, the SGR equation to be used should be the one with minimum critical variables and preferably without the variables which original model assumes to be constant.

Only by this approach, one can eliminate the volatility created in the SGR calculations stemming from instability of the variables which are supposed to be stable. Therefore, instead of Higgins' (1977) below equation a shorter version is more appropriate for the calculation of SGR in backward looking empirical studies.

$$g = \frac{\Delta s}{s} = \frac{p(1-d)(1+L)}{t-p(1-d)(1+L)} \quad (1)$$

p = the profit margin on new and existing sales after taxes,	d = the target dividend payout ratio, (1-d) therefore is the target retention ratio,
L = the target total debt to equity ratio,	t = the ratio of total assets to net sales on new and existing sales
s = sales at the beginning of the year and	Δs = increase in sales during the year

Equation (1) simplifies as below, where E stands for the equity and D stands for the debt of the company

$$SGR = \frac{p(1-d)(1+{}^{D}/_{E})}{\frac{E+D}{S} - p(1-d)(1+{}^{D}/_{E})} x \frac{S}{S} SGR = \frac{p(1-d)(\frac{(E+D)}{E} xS}{(E+D) - p(1-d)(\frac{(E+D)}{E})xS}$$

Assuming

$\frac{pxS}{E}$ and dividing by (E+D) the SGR formula becomes

$$SGR = \frac{ROE\ x(1-d)}{1-ROE(1-d)} \quad (2)$$

ROE in the above formula is calculated from the ending balance sheet, since beginning period and ending period leverage (L) has to be the same. As said, in a backward looking study, equation (2) which utilizes minimum number of variables (only ROE and d) is more convenient.

In this study, it is aimed to test whether growth rate above sustainable growth rate (SGR) which is described by equation (2), create value and whether this value creation is at the same rate as the growth rate below SGR. Secondly, it is also intended to determine how value creation changes at growth levels beyond SGR.

The data used in this study composed of financial statements and stock prices of 167 manufacturing and service companies publicly traded in Borsa Istanbul (BIST) between 2003 and 2012.

Based on this data, 1670 annual observations are obtained for the variables net sales, net profit, shareholders' equity, total debt, dividends, market capitalizations. Financial companies and banks are particularly excluded as total revenues would be less meaningful for these companies in measuring firm size. Additionally, the annual data for 2004 incorporated inflation adjustments. It is the only year in the dataset which is subject to inflation adjustments. In order to preserve the consistency of the figures, the data collected before 2005 is not taken into consideration. Final analysis is made on the data from 2005 onwards, basing on 1336 annual observations. On the other hand, for some variables year-end figures are required, so in the final analysis actually 1169 full year observations are employed.

The data collected using the FINNET software is randomly cross-checked with some other publicly available data sources. All detailed calculations of variables and ratios are made by a spreadsheet program after collecting the raw data. Final analysis of the data and empirical study is made using EVIEWS econometric software. As the collected data have the same cross-sectional units (firms) surveyed over time, panel data methodology is adopted. The variables used in the study are as follows:

TRS (total return to shareholders) is the rate of increase in the market capitalization (number of outstanding shares multiplied by market share price) of the firm adjusted for any capital increases in cash and dividend payments made. It is estimated with the below equation

$$TRS_{it} = (Market\ Value_{it} - Market\ Value_{i,t-1} - Capital\ Increase_{it} + Dividends_{it}) / Market\ Value_{i,t-1}$$

Where

$Market\ Value_{it}$ is the market capitalization of the firm i at the end of year t;

$Capital\ Increase_{it}$ is the capital increase of firm i made during the year t;

$Dividends_{it}$ is the dividend payments made in firm i during the year t

Growth is the rate of increase in the sales revenues of the firm over its sales volume in the previous year. It is estimated as follows:

$$Growth_{it} = (Sales_{it} - Sales_{i,t-1})/Sales_{i,t-1}$$

Where

$Sales_{it}$ is the net sales volume of firm i in year t.

SGR_{it} is the sustainable growth rate of firm i for the year t, calculated with Equation (2)

$$SGR_{it} = p_{it} \times ROE_{it} / (1 - p_{it} \times ROE_{it})$$

where p_{it} is the plowback or retention rate of firm i in year t. It is calculated with below equation

$$p_{it} = 1 - dividend_{it} / Net\ profit_{i,t-1}$$

ROE_{it} is return on equity calculated with the equation

$$ROE_{it} = Net\ profit_{it} / Equity_{it}$$

$Overgrowth_{it}$ is the rate of growth above the sustainable growth rate for firm i in year t, estimated as follows,

$$Overgrowth_{it} = growth_{it} - SGR_{it}$$

$Size_{it}$ is the variable indicating size of the individual firm, measured by the annual sales volumes in Turkish Lira divided by 1 million to avoid dealing with big numbers.

$Cap\_inc\_pro_{it}$ is the proportion of capital increase made during year t in firm i to its market capitalization at the end of year t-1. The estimation equation is as follows:

$$Cap\_inc\_pro_{it} = capital\ increase_{it} / market\ capitalization_{i,t-1}$$

The hypothesis and associated null hypothesis of the study is suggested as follows:

H_0: The growth rate above SGR creates value at the same rate as the growth rate below SGR,

H_1: The growth rate above SGR creates value at a rate less than the growth rate below SGR, or destroys value

This hypothesis is tested with the dependent variable TRS_{it} which measure the rate of value creation for the shareholders and the independent variables:

X_{1it}: $growth_{it,}$

X_{2it} : $Overgrowth_{it}$

X_{3it} : $Size_{it}$

X_{4it} : $Cap\ inc\_pro_{it}$

Besides testing the above hypothesis, the study especially aimed to examine exact shareholder value creation behavior at excess growth levels above SGR, in order to disclose any optimal point of growth, if exists.

Size and *Cap_inc_pro* are variables which control for the possible effects of size of the firm and capital increase on value addition.

In Table 1, the correlations between the explanatory variables are given. Obviously there is no multi-collinearity problem between the independent variables of the model. The highest correlation between the explanatory variables is between sales and growth, being only 6.2%.

Table 1. Correlations Between the Independent Variables

	GROWTH	OVERGROWTH	SALES	CAP_INC_PRO
GROWTH	1.000000	0.036316	0.061962	-0.037415
OVERGROWTH	0.036316	1.000000	0.002884	-0.050624
SALES	0.061962	0.002884	1.000000	-0.019468
CAP_INC_PRO	-0.037415	-0.050624	-0.019468	1.000000

Non-stationarity or unit root in time-series may result in spurious relations in regressions. The series are tested for unit root before constraining the sample as growth above SGR in order not to distort balanced nature of the series. Four major tests are applied to the data, namely Levin, Lin and Chu, Im. Pesaran, Shin

W-stat, ADF – Fisher Chi-square, PP – Fisher Chi-square. All series are found stationary except sales. Apparently, sales series is non-stationary which can be expected as companies generally grow overtime or disappear. A company's sales volume is expected to increase no less than the inflation rate, even if there is no expansion in the operations. A sales increase less than the inflation rate actually indicates a decrease in the size of the firm.

4. Empirical Results

In pooled estimation of companies which grew above their SGR, all the coefficients are with expected signs and all t-values of coefficients are highly significant ($p<0.01$). F statistic is also highly significant confirming the overall validity of the model. The selected model explains 6.8% variation in total shareholder return (Table 2). One of the underlying assumptions of ordinary least squares estimation is that all observations have the same error variance and that errors are uncorrelated with one another. A simple pooled ordinary least squares regression forces the coefficients to be identical across the firms and periods, and eliminates heterogeneity.

Cross-sectional fixed effects model calculation reveals that cross-sectional fixed effects model is not the appropriate for the analyzed data. The p value for F- statistics proves that the model is not a valid one.

Table 2. Summary of Regressions with Different Methods

Coefficient	Pooled Least Squares	Panel EGLS with Period Fixed Effects	Panel EGLS with Cross-section random Effects	Panel EGLS with Period Random Effects
Growth	0.190518***	0.263738***	0.190518	0.261692***
Overgrowth	-0.109837***	-0.059388	-0.109837**	-0.059993**
Cap_Inc_Pro	-0.982576***	-0.938463***	-0.982576***	-0.938772***
R^2	0.068091	0.461235	0.068091	0.101675
F-statistic	2941***	68***	18***	27***

*** $p<0.01$, ** $p<0.05$, * $p<0.10$

When we allow fixed effects for periods, the model's F-statistics becomes significant with an R^2 of around 46%. However, the t statistic for the coefficient of overgrowth turns out to be insignificant (Table 2). The signs of the coefficients remain same as in the pooled model. In the cross-sectional random effects model, although the F-statistic is significant, the t-statistic for growth is not significant. When we look at the component variance (effects specification), no effect seem to originate from cross-section random. In the chosen data, period effects are more substantial compared to cross section effects. Consequently, a model with period random effects offers a better model estimation. The model explains roughly 10% of the variation in total return to shareholders and signs of coefficients are as expected and all t-values of the coefficients are significant ($p<0.05$).

The null hypothesis underlying Hausman (Hausman and Taylor, 1981) test is that the FEM (Fixed Effects Model) and REM (Random Effects Model) estimators do not differ significantly. When the null hypothesis is rejected, the conclusion is that REM is not appropriate because random effects are correlated with one or more regressors. In this case, since null hypothesis is not rejected, REM model is preferred to FEM (Table 3) as the actual regression results also advised.

The Breusch-Pagan (Breusch and Pagan, 1980) Lagrange Multiplier test examines the presence of individual specific random effects against the null hypothesis of i.i.d. (independently and identically distributed) errors. In other words, it proposes a model selection methodology between the pooled model and the REM model. The result of Breusch-Pagan test is given in Table 3. According the test the null hypothesis is rejected, in other words, the test prefers the REM model over the pooled model.

Table 3. Hausman and Breusch-Pagan Test Results

Hausman Test (TRS) – period random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	4.617654	3	0.2020
Lagrange multiplier (LM) test for panel data (TRS)			
Null (no rand. effect)	Cross-section	Period	Both
Alternative	One-sided	One-sided	
Breusch-Pagan	12.99524	4372.859	4385.854
	(0.0003)	(0.0000)	(0.0000)

In Table 2, the coefficients of the variables estimated with different methods are presented. As seen in the last column of the table, roughly 10% of growth in sales increases 2.6% of the market value of equity of the company, but at the same time every 10% marginal growth above SGR decreases the return to shareholders by 0.6%. Exceeding SGR seems to create a counter effect on shareholder value creation process. To confirm this, total return to shareholders for the sample that has growth below their SGR has also been analyzed. Again, random period effects model is preferred as it appeared to be better reflecting the variation in the dataset. The growth coefficient for the observations below sustainable growth rates and with positive growth is 1.31, which is significantly above the coefficient for the growth above SGR (0.261692). The result proposes that the growth which does not exceed SGR creates significantly more value for the shareholders than the growth above SGR. Additionally, the coefficient of capital increase (cap_inc_pro) is insignificant, meaning that value creation is not effected from capital increase at the growth rates below SGR. This might be expected since capital increase is a financing choice and should not have any major impact on shareholder value other than changing the capital structure of the firm. Of course, one can always claim that when leverage is reduced with capital injection some of the tax benefit is lost. However, that is only valid for profitable firms. Secondly, some tax benefit is lost but at the same time financial distress cost is also decreased.

Table 4. Coefficients of Growth and Overgrowth for Different Overgrowth levels

	Growth Coefficient		Overgrowth Coefficient		Net Marginal Contribution of Growth
Growth<SGR	1.312428	***			1.312428
Growth>SGR	0.261692	***	-0.059993	**	0,201699
Overgrowth>0.01	0.243123	***	-0.061227	**	0,181896
Overgrowth>0.02	0.232964	***	-0.062209	**	0,170755
Overgrowth>0.03	0.238603	***	-0.063868	**	0,174735
Overgrowth>0.04	0.215210	***	-0.064096	**	0,151114
Overgrowth>0.05	0.221532	***	-0.065998	**	0,155534
Overgrowth>0.06	0.221919	***	-0.064491	**	0,157428
Overgrowth>0.07	0.211644	**	-0.067009	**	0,144635
Overgrowth>0.08	0.192105	**	-0.062828	**	0,129277
Overgrowth>0.09	0.163920	**	-0.057738	*	0,106182
Overgrowth>0.10	0.112673		-0.049998	*	0,062693

*** p<0.01, ** p<0.05, * p<0.10

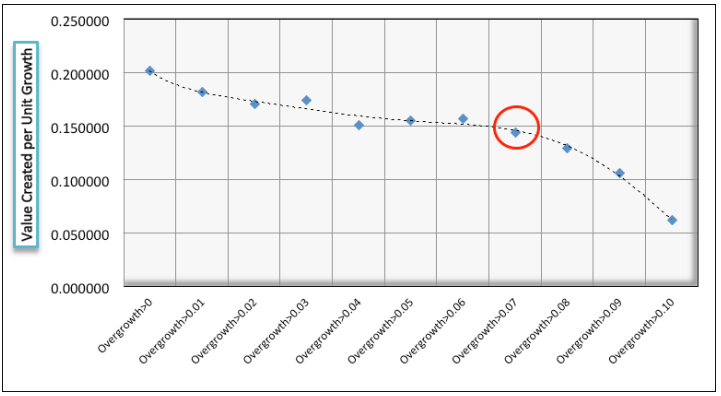
To see the actual effect of sales growth on shareholder return above SGR, different growth levels beyond SGR are analyzed by restricting the sample with 1% increments of growth rate. The results are presented in Table 4.

On average a firm that does not exceed its SGR creates 1.31% shareholder value for 1% of marginal growth in its net sales. On the other hand the value creation per unit growth diminishes as growth exceeds SGR. Marginal growth above SGR on average creates value only as much as 1/6 of the average growth below SGR.

Figure 1 demonstrates how marginal shareholder value creation behaves at different growth levels above SGR. When a company's growth rate exceeds its sustainable growth rate, the rate of marginal shareholder value creation, by means of sales revenue increase, seems to continuously decrease. Figure 1 also hints the possibility of providing same or higher amount of return

to shareholders with less growth. Value creation rate seems to turndown steeply after the overgrowth level of 7%.

Figure 1: Marginal TRS at Different Overgrowth Levels



The inflection point on Figure 1 is the evidence of an overgrowth level where value creation maximizes and thereafter starts to decrease. Figure 2 illustrates how Total Return to Shareholders (TRS) behaves when growth rate exceeds SGR for three different SGR levels. Data points are estimated with the growth value 0.5% above the restriction level. In other words, the data point for the sample with above 1% overgrowth level is estimated with the overgrowth level of 1.5%. Clearly, a firm continues to enhance shareholder value at growth levels above SGR. However, total value created does not increase in line with the growth. It starts to decrease when growth rate is roughly 7% above the SGR. Although Figure 1 suggests a decreasing marginal contribution of growth to shareholder value creation when growth exceeds SGR, Figure 2 explicitly shows that a company may start destroying value when growth rate significantly exceeds SGR. For instance, according to the Figure 2, a company with 10% sustainable growth rate may be creating same amount of shareholder value with 15% and 18.5% growth in sales. In other words, extra 3.5% sales growth does not create any extra value for shareholders. Further to this, same company when chooses to grow faster (above 18.5%), creates even less value compared to growing at 15%.

Figure 2. TRS at Different Growth Levels and SGR

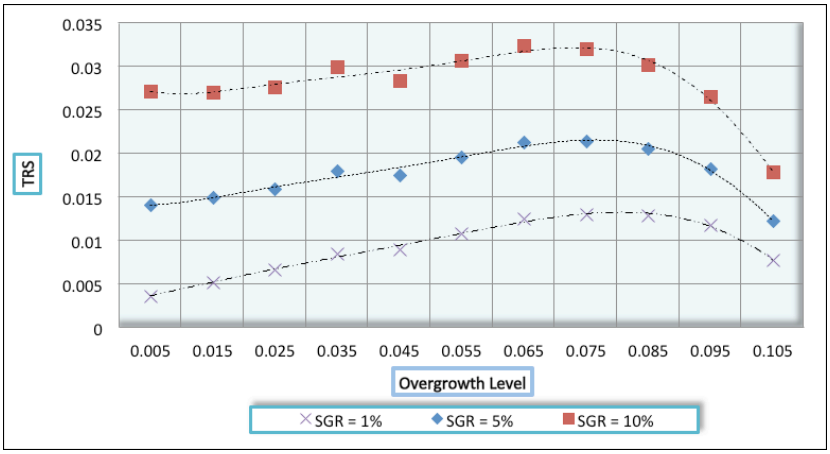


Figure 2 implies that the companies in our sample create value for the shareholders up to a growth level of maximum around 7% above their sustainable growth rate. Beyond that level, they seem to start destroying value of shareholders. Figure 2 actually confirms the concave nature of value creation of growth suggested by Ramezani *et al.*(2002) In their study, EVA increased until the third quartile of firms which were sorted according to their growth level, and declined in the fourth. They presumed an inverted U-shaped relationship between EVA and growth. However, we see in Figure 2 the precise evolution of shareholder value against the growth levels similar to what they have actually hypothesized.

5. Conclusion

Firm growth is generally expected to result in higher company value, consequently higher return to shareholders. But growth and value adding mechanism, especially the value contribution of high growth are not clarified with sufficient empirical evidence. This study empirically evaluated the validity of the claim that fast paced growth or excessive growth leads to destruction of value. It is empirically demonstrated that there is an optimal point of sales growth, beyond which further growing sales revenues of the firm destroys shareholder value. As evident from the findings of this study, firms continue to create value until a specific growth level above SGR.

Beyond that, additional growth only contributes to destruction of shareholders' value. Given the undesirability of fast growth which generally ends up with higher debt level, and the observation that significant amount of value might be destroyed by overgrowing, firms may willingly restrain their growth rate.

The firms in the sample continued to create value by growing their sales volume up to 7% above SGR in each period. We can interpret the result, in line with the 'financial slack' proposal of Myers and Majluf (1984), that the firms in the dataset were operating below their optimal leverage and the margin between current leverage and optimal leverage was only enough to support a growth rate of around 7%. In other words, firms had some "cash under mattress" or room to further increase their indebtedness for unforeseen emergencies. Beyond optimal leverage level, firms start to destroy their shareholders' value by further growing.

One other interpretation may be that we have underestimated SGR levels by 7% on average or SGR is not a workable limit of growth in practice. Nevertheless, both interpretations do not change the fact that there exists a specific limit of growth beyond which firms start to destroy value. Although the ultimate goal of the firm is to maximize the value of shareholders' equity and growing revenues of the firm is one of the most important tools to achieve this goal, fast growth may be sometimes value destructing.

Generally, unavailability of financing is seen as a headwind that drags back the pace of growth. However, empirical evidence in this study shows that even if the firm is capable of financing high growth, it has to reconsider it. By growing excessively, it may be destroying the value of its shareholders. If the crystal balls of the firm promise a long high growth period, with an average growth rate significantly above the projected SGR, then definitely an equity injection has to be considered. High and rising levels of leverage may eventually spark financial distress. Without a sizeable capital injection, the firm may run into financial trouble through high cash required by the expansion of its operation.

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