DYNAMIC RELATIONSHIP AMONG SUSTAINABLE GROWTH RATE, PROFITABILITY AND LIQUIDITY OF FIRMS
A CASE STUDY FROM PHARMACEUTICAL SECTOR IN PAKISTAN

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ABSTRACT
This paper aims to examine the relationship among profitability, liquidity and sustainable growth rate of pharmaceutical firms which are listed in the Pakistan stock exchange during 2007-2014. By using correlation analysis to examine the relationship among the sustainable growth rate and Return on Assets (ROA), Return on Equity (ROE,) Earnings per Share (EPS), Current and Acid test ratios. It is analyzed that there is significant relationship between sustainable growth rate and quick ratio, current ratio, return on asset and earnings per share while there is no evidence received from this study for relationship between the sustainable growth rate and firm size and return on equity.
Keywords*:* Sustainable Growth Rate, Financial ratio, Profitability ratio and Liquidity ratio
JEL Classification: G3

1. INTRODUCTION

As development requires comparable increment in resources for support without value issuance, any benefit increments must be financed with included liabilities or from held income. In this manner if money related arrangements are unaltered, the rate of shareholder value development will constrain deals development. The sustainable development rate is particularly significant on the grounds that it consolidates working (overall revenue and resource effectiveness) and monetary (capital structure and consistency standard) components into one far reaching measure.[1] Utilizing sustainable growth rate, directors and financial specialist can start to gage whether the firm's future development arrangements are sensible in view of their present execution and approach or not.

Along these lines, Sustainable Growth Rate can give administrators and speculators understanding into the levers of corporate development.[2] The idea of Sustainable Growth Rate was initially created by C. Higgins. He showed that the money related approaches of numerous enterprises may be at difference with their development objective.

As a guide for setting perfect budgetary arrangements and development destinations. Supportable Growth Rate is the greatest rate at which organization deals can increment without consumption money related assets.[3]

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[1] Nasrollah Amouzesh, *Sustainable Growth Rate and Firm Performance: Evidence from Iran Stock Exchange*, International Journal of Business and Social Science, 2 (2011) no. 23: 249
[2] Nirali Pandit and Rachana Tejani, *Sustainable Growth Rate of Textile and Apparel Segment of the Indian Retail Sector*, 11 (2011) 6, 39-44
[3] Robert C. Higgins, *How much growth can a firm afford?* Financial management, (1998) 7-17.

The Sustainable Growth Rate of any organization is dictated by the accompanying four elements:

1. Overall revenue. an expansion in the overall revenue increment the association's capacity to create finances inside and in this way increment its economic development.
2. Net resource turnover. An expansion in the firm's net resources turnover builds the deals produced for every rand in resources; this decline the firm's requirement for resources as deals develop consequently increment the Sustainable Growth Rate.
3. Money related strategy. An expansion in the Debt/Equity proportion increment the firm "s money related use; and since this makes extra obligation financing accessible, it increment the SGR
4. Profit arrangement. A reduction in the rate of net benefit after assessment paid out as profits increment the maintenance proportion, thusly expanding inside produced value and hence expanding practical development.

The Sustainable Growth Rate equation is a profitable arranging device since it stresses the connection between the four elements portrayed above and Sustainable Growth Rate. It is additionally certain that if an organization does not have any desire to issue offers or change its benefit, resource turnover, money related adapting or profit approach; it has just a single Sustainable Growth Rate. [4] A real development rate in deals not quite the same as manageable development rate is conflicting with a settled monetary arrangement and like it or not, organizations will be notable keep up money related focuses under this condition.

Profitability ratios are a class of financial metrics that are used to assess a business's ability to generate earnings compared to its expenses and other relevant costs incurred during a specific period of time. For most of these ratios, having a higher value relative to a competitor's ratio or relative to the same ratio from a previous period indicates that the company is doing well.

Liquidity ratios measure a company's ability to pay debt obligations and its margin of safety through the calculation of metrics including the current ratio, quick ratio and operating cash flow ratio. Current liabilities are analyzed in relation to liquid assets to evaluate the coverage of short-term debts in an emergency. Growth of a firm requires the monitory

[4] JH De Wet, Growth sales and value creation terms of the financial strategy matrix, *University of Pretoria ETD,* (2004)

resources and liquidity that how quick a firm can liquidate its assets and these are determinants which are studied in this study.

2. THEORETICAL FRAMEWORK

Develop firms frequently have actual development rates that are not as much as sustainable growth rate. In these cases, administration's primary target is finding profitable utilizations for the trade streams that exist out overabundance of their needs. Alternatives accessible to entrepreneurs and administrators in such cases incorporate giving back the cash to shareholders through expanded profits or basic stock repurchases, lessening the association's obligation stack, or expanding ownership of lower procuring fluid resources. Over the past several years, various growth models have been defined.

These models can be categorized into two areas: traditional (debt /equity) determined and cash flow – determined models. Traditional growth rate model use the debt to equity or debt to total assets ratio as a limiting factor. The growth rates of capital intensive companies are best determined with a traditional model.[5]

2.1 Zakon's model

A well- known model is that of the Boston Consulting Group's Model (BCG):

SGR = D/E. (R-i) p + Rp

Where,
SGR = Sustainable growth rate
D/E = debt / equity ratio
R = ROA
I = interest rate (1- taxation rate) and
p= retention ratio

When we investigations the parts of the equation ,unmistakably the SGR is resolved as far as an organization's gainfulness, and also money related strategies in regards to budgetary adapting and profits.

2.2 Van Horne's Model of Sustainable Growth Rate

Sustainable Growth Rate also defined as the maximum annual percentage increase in sales that can be achieved based on target operating, debt and dividend-payout ratios.[6] Given this definition, a company can determine if their projected

[5] Hong-Yi Chen, Manak C. Gupta, Alice C. Lee and Cheng-Few Lee, *Sustainable Growth Rate, Optimal Growth Rate, and Optimal Payout Ratio: A Joint Optimization Approach* (2011).
[6] Van Horn and C. James, *Sustainable Growth Modelling, Journal of Corporate Finance*, (1998) 19-25.

sales are a realistic goal. Van Horne's sustainable growth rate model is the quantitative descriptive of the sustainable growth rate which is the variance of the sale income, i.e.

SGR =b (NP/S) (1+D/E)/ (A/S)-b (NP/S) (1+D/E)

Where,
A/S is the rate of the total assets and the sales,
NP/S is the net profit rate,
b is the retained profits (1-b is the dividends ratio),
D/E is the ratio of the debt and the equity,
S is the sales in the recent year, and
ΔS is the absolute variance of the sales in the recent year.

This formula can be written in following way also.[7]

SGR = ROE x b / 1 – (ROE x b)

Where,
b is the Dividend Payout Ratio (dividends divided by earnings)
ROE is the Return on Equity (net income divided by shareholders' equity).

2.3 Higgins's Model of Sustainable Growth Rate

Higgins's Model the model for computing SGR is[8]:

SGR = (P) (1-R) (1+L)/A-(P) (1-R) (1+L)

Where,
P=Profit Margin on Sales after Taxes
R=Percent of Profit Returned to Owners
L = Debt to Equity Ratio
A = Asset to Sales Ratio

SGR is a measure that firms for different purposes, such as to evaluate the creditworthiness of companies. If the actual growth rate in the sales of a company is greater than the SGR, financial institutions are prepared to advance loans to the company or to assist in the issue of shares in order to provide the capital needed. If the actual growth rate of sales is consistently lower than the SGR, the cumulative cash surpluses would need to be invested and the financial institution may offer investment products to the company.[9]

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[7] Rui Hung , Guiying Liu. (2009).Study on the enterprise sustainable growth and the leverage mechanism. International Journal of Business and Management. vol 4 . No 3 , pp . 200-205
[8] Robert C. Higgins, *How much growth can a firm afford?* Financial management, (1998) 7-17.
[9] JH De Wet, Growth sales and value creation terms of the financial strategy matrix, University of Pretoria ETD, (2004)

It can also be written as;

SGR = *PRAT*

Where,
P is the Profit Margin (net profit divided by revenue)
R is the Retention Rate (1 minus the dividend payout ratio)
A is the Asset Turnover Ratio (sales revenue divided by total assets)
T is the Assets-to-Equity Ratio (total assets divided by shareholders' equity)

The growth rate in sales is limited by the growth we can obtain from the equity side of the Balance Sheet. Therefore, sustainability is a function of equity growth rates, not sales growth rates. The formula for calculating a sustainable growth rate (SGR) is:

SGR = Margin x Turnover x Leverage x Retention

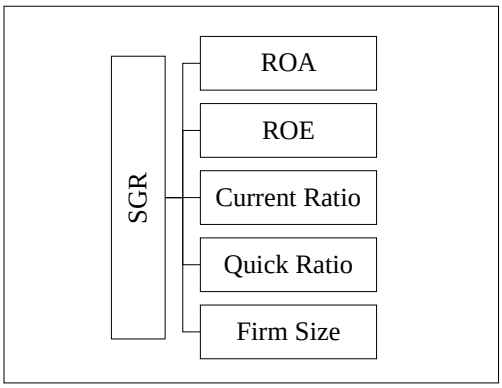
Margin = Net Income / Sales

Turnover = Sales / Assets

Leverage = Assets / Equity

Retention = % of Earnings Retained

Figure 2.1: Conceptual Framework



Therefore, in the event that we need to keep up a steady level in overall profit margins, asset turnover, leverage, and retained earnings, than we ought to develop our deals by SGR (sustainable growth rate). Changing the reasonable development rate is an element of the four segments of economic development. For instance, disposing of negligible items can build the Margin segment or paying out less profits will expand the Retention segment. The trap is to deal with the four segments so that business development takes after the sustainable growth rate. As described the sustainable growth rate (SGR) concept by Robert C. Higgins is based on several assumptions such as constant profit

margin, constant debt to equity ratio or constant asset to sales ratio. Therefore, general applicability of SGR concept in cases where these parameters are not stable is limited.

2.4 Challenges of sustainable growth rate

Business experts argue that achieving sustainable growth is not possible without paying attention to two important aspects. Companies that fail to give adequate attention to one aspect or the other are doomed to fail in their efforts to establish practices of sustainable growth in the long run. Achieving the sustainable growth rate is the prime concern of managers of companies, whether small or big.[10] But in a fast changing economic, political and competitive environment, achieving the sustainable growth rate is not an easy task, especially in the present highly complex global environment.[11]

3. DEVELOPMENT OF HYPOTHESIS

According to Higgins, SGR depends upon the change in equity in a financial year divided by opening equity without any additional equity introduced during the year. Such a change is possible only through the retained earnings. thus , the funds generated through retained earnings increase the net worth of the firm and with the increase in the net worth , the firm can borrow more funds which would enables the firm to increase its asset base. The increase in assets results in increase in operation which ultimately results in increase in profit and thereby increases in retained earnings.[12]

Following are the hypothesis which are needed to test;

H_1: There is significant relationship between the sustainable growth rate and current ratio.

H_2: There is significant relationship between the sustainable growth rate and Acid ratio.

H_3: There is significant relationship between the sustainable growth rate and Return on Assets (ROA).

H_4: There is significant relationship between the sustainable growth rate and return on equity (ROE).

H_5: There is significant relationship between the sustainable growth rate and earnings per share (EPS).

H_6: There is significant relationship between the sustainable growth rate and size of the firm (Log (TA)).

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[10] Enzo Bivano, *How to define a profitable and sustainable growth policy in a changing market? A case study: a small publishing company*, Proceedings of the 18th international system dynamics conference, Bergen, Norway, 6-10 (2000)

[11] Rui Hung and Guiying Liu, *Study on the enterprise sustainable growth and the leverage mechanism*, International Journal of Business and Management, 4 (2009) *no 3*, 200-205.

[12] Jagdish Raiyani and Nilesh Joshi, *Eva based performance management. A case study of FBI Bank SMS Vanarasi*, Management Insight, 7 (2012) *no. 1*, 122-135.

4. METHODOLOGY

4.1 Sample Selection

The statistical population is all pharmaceutical firms Listed in Pakistan stock exchange. Out of ten, six companies are selected for the sample. Statistical sample of the research has been gained through applying following conditions:

1. Due to their having a nature of operation different from other corporate, investment and financial corporate have been omitted from sample of research.

2. Loss firms are excluded from our sample.

3. Required information such as financial statements and notes to financial statements, summary of decisions taken by regular general meeting having been published by stock exchange organization are available.

4.2 Research method

The correlation analysis is used in this study. correlation researches are researches that researcher try to determine relationship between different variables using with correlation coefficient. In these researches, appointment coefficient is criterion that this criterion describes relationship between independent and dependent variables. Amount of this coefficient states what percentage of changes in dependent variable are described by independent variable. Also we used descriptive statistics such as central indexes as well as dispersion for data analyzing.

4.3 Variables Definition

The acid-test or quick ratio or liquidity ratio measures the ability of a company to use its near cash or quick assets to extinguish or retire its current liabilities immediately. Quick assets include those current assets that presumably can be quickly converted to cash at close to their book values.

The current ratio is a liquidity ratio that measures a company's ability to pay short-term and long-term obligations. To gauge this ability, the current ratio considers the current total assets of a company (both liquid and illiquid) relative to those company’s current total liabilities.

Return on assets (ROA) is a financial ratio that shows the percentage of profit a company earns in relation to its overall resources. It is commonly defined as net income divided by total assets. Net income is derived from the income statement of the company and is the profit after taxes. The formula of ROA is Return on Assets (ROA) = Net Income / Total Asset

Return on equity (ROE) is a measure of profitability that calculates how many dollars of profit a company generates with each dollar of shareholders' equity. The formula for ROE is: ROE = Net Income/Shareholders' Equity. ROE is sometimes called "return on net worth."

Earnings per share (EPS) are the portion of a company's profit allocated to each outstanding share of common stock. Earnings per share serve as an indicator of a company's profitability. However, data sources sometimes simplify the calculation by using the number of shares outstanding at the end of the period.

Firm size has become such a routine to use as a control variable in empirical corporate finance studies that it receives little to no discussion in most research papers even though not uncommonly it is among the most significant variables.

5. DATA ANALYSIS

5.1 Descriptive Analysis

Table 5.1 provides the descriptive statistics for all variables utilized in this study. The table reports the mean, minimum, maximum and standard deviation.

Table 5.1: descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
SGR	48	-7.95	52.19	10.9267	12.38900
QR	48	.08	2.57	0.8571	.68186
CR	48	.96	4.49	2.1769	.93856
FS	48	5.68	7.06	6.3998	.40149
ROE	48	.16	52.20	25.5444	12.65806
ROA	48	3.12	36.41	17.2444	9.32674
EPS	48	2.81	50.24	13.3356	9.60256

Based on table# 1, the average percentage of Quick ratio, current ratio, firm size, return on equity, return on asset and earnings per share equal to 0.8571, 2.1769, 6.3998, 25.54, 17.24, and 13.3356 respectively. The table provides some information about SGR variable, which ranges from -7.95 to 52.19 and a standard deviation of 12.3890 with the mean value of 10.9267.

5.2 Correlation Analysis

Tables 5.2, 5.4, 5.6, 5.8, 5.10 and 5.12 reports Pearson Correlation Analysis and regression for all companies in the sample whereas tables 5.3, 5.5, 5.7, 5.9, 5.11 and 5.13 contain the results from the linear regression model used to test the respective hypotheses.

5.3 Results of H_1

Table 5.2: Correlations

		SGR	QR
SGR	Pearson Correlation	1	.394**
	Sig. (2-tailed)		.006
	N	48	48
QR	Pearson Correlation	.394**	1
	Sig. (2-tailed)	.006	
	N	48	48

**Correlation is significant at the 0.01 level (2-tailed).

Table 5.3: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.794	2.686		1.785	.081
	QR	7.156	2.462	.394	2.906	.006

Dependent Variable: SGR

Results in table 5.2 shows that Correlation coefficient is 0.394 which means that there is a significant relationship between sustainable growth rate and the quick ratio.

5.4 Results of H_2

Table 5.4: Correlations

		SGR	CR
SGR	Pearson Correlation	1	.328*
	Sig. (2-tailed)		.023
	N	48	48
CR	Pearson Correlation	.328*	1
	Sig. (2-tailed)	.023	
	N	48	48

*Correlation is significant at the 0.05 level (2-tailed).

Table 5.5: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.494	4.351		.343	.733
	CR	4.333	1.838	.328	2.357	.023

Dependent Variable: SGR

Results in table 5.4 have shown that Correlation coefficient is 0.328 in which means that there is a significant relationship between sustainable growth rate and the current ratio.

5.5 Results of H_3

Table 5.6: Correlations

		SGR	FS
SGR	Pearson Correlation	1	-.399**
	Sig. (2-tailed)		.005
	N	48	48
FS	Pearson Correlation	-.399**	1
	Sig. (2-tailed)	.005	
	N	48	48

**Correlation is significant at the 0.01 level (2-tailed)

Table 5.7: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	89.774	26.747		3.356	.002
	FS	-12.320	4.171	-.399	-2.954	.005

Dependent Variable: SGR

Results in table 5.6 Shows that Correlation coefficient is -0.399 which means that there is a no significant relationship between sustainable growth rate and the firm size.

5.6 Results of H_4

Table 5.8: Correlations

		SGR	ROE
SGR	Pearson Correlation	1	.058
	Sig. (2-tailed)		.695
	N	48	48
ROE	Pearson Correlation	.058	1
	Sig. (2-tailed)	.695	
	N	48	48

Table 5.9: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.477	4.099		2.312	.025
	ROE	.057	.144	.058	.394	.695

Results in table 5.8 shows that Correlation coefficient is 0.058 in the entire sample companies' level. It means that there is a no significant relationship between sustainable growth rate and the return on equity.

5.7 Results of H_5

Table 5.10: Correlations

		SGR	ROA
SGR	Pearson Correlation	1	.313*
	Sig. (2-tailed)		.030
	N	48	48
ROA	Pearson Correlation	.313*	1
	Sig. (2-tailed)	.030	
	N	48	48

*Correlation is significant at the 0.05 level (2-tailed).

Table 5.11: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.758	3.638		1.033	.307
	ROA	.416	.186	.313	2.235	.030

Results in table 5.10 shows that Correlation coefficient is 0.307 in the entire sample companies' level. It means that there is a significant relationship between sustainable growth rate and the return on asset.

5.8 Results of H_6

Table 5.12: Correlations

		SGR	EPS
SGR	Pearson Correlation	1	.278
	Sig. (2-tailed)		.056
	N	48	48
EPS	Pearson Correlation	.278	1
	Sig. (2-tailed)	.056	
	N	48	48

Table 5.13: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.144	2.992		2.054	.046
	EPS	.359	.183	.278	1.963	.056

Results in table 5.12 have shown that Correlation coefficient is 0.278 in the entire sample companies' level. It means that there is a significant relationship between sustainable growth rate and the earning per share.

6. CONCLUSION

The results show that there is significant relationship among sustainable growth rate and quick ratio, current ratio, return on asset and earnings per share while there is no evidence for the relationship between the sustainable growth rate and firm size and return on equity. It is found that return of equity is a profitability ratio but it has no significant relationship with firm's sustainable growth rate. Due to this, there is a room for further research on sustainable growth rate with other firms and sectors. Implication of this study is basically finding out that where a firm should must give its attention to get sustainability in their growth rate. Moreover it provides a route to new researches about sustainable growth rate of firms in different sectors and opens a door for the researcher to open out hidden truth. Future research should be conducted taking into some financial ratios such as the financial leverage and other profitability ratios. An additional research might also be directed towards the effect of deviation of actual growth rate from sustainable growth rate on liquidity and firm performance using larger samples and longer time series.

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