T.C.
MARMARA ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İŞLETME ANABİLİM DALI
İNGİLİZCE MUHASEBE FİNANSMAN BİLİM DALI

SUSTAINABLE GROWTH IN CORPORATIONS: AN APPLICATION IN ISTANBUL STOCK EXCHANGE

Yüksek Lisans Tezi

ENDER DEMİR

İstanbul, 2006

T.C.
MARMARA ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İŞLETME ANABİLİM DALI
İNGİLİZCE MUHASEBE FİNANSMAN BİLİM DALI

SUSTAINABLE GROWTH IN CORPORATIONS: AN APPLICATION IN ISTANBUL STOCK EXCHANGE

Yüksek Lisans Tezi

ENDER DEMİR

Danışmanı : Doç. Dr. Jale ORAN

İstanbul, 2006

ACKNOWLEDGEMENTS

This Thesis is by far the most significant scientific accomplishment in my life and it would be impossible without people who supported me and believed in me. I would like to express my gratitude to Associate Prof. Jale Oran for the support and assistance in writing this thesis. Her trust and scientific excitement inspired me in the most important moments of making right decisions and I am glad to work with her. I thank Associate Prof. İ.Melih Baş for the idea of choosing this subject and I am grateful to all my friends from Kadir Has University.

Finally, I am forever indebted to my mother Fatma Demir, my father Mehmet Demir, to my brother Ömer Demir, to my sister Emel Demir and to my eternal thesis Serpil Köprülü for their understanding, endless patience and encouragement when it was most required.

LIST OF CONTENTS

Page Number

LIST OF TABLES

Page Number

LIST OF FIGURES

Page Number

LIST OF ABBREVIATIONS

AGR	Actual Growth Rate
D	Dividend Payout Ratio
ISE	İstanbul Stock Exchange
NGR	Nominal Actual Growth Rate
R = 1-D	Retention Ratio
RGR	Real Actual Growth Rate
ROE	Return on Equity
SGR	Sustainable Growth Rate

Marmara Üniversitesi
Sosyal Bilimler Enstitüsü Müdürlüğü

Tez Onay Belgesi

İŞLETME Anabilim Dalı MUHASEBE FİNANSMAN(İNG) Bilim Dalı Yüksek Lisans öğrencisi ENDER DEMİR nın SUSTAINABLE GROWTH IN CORPORATIONS:AN APPLICATION IN ISTANBUL STOCK EXCHANGE adlı tez çalışması ,Enstitümüz Yönetim Kurulunun 22.06.2006 tarih ve 2006/06-13 sayılı kararı ile oluşturulan jüri tarafından Yüksek Lisans Tezi olarak kabul edilmiştir.

	Öğretim Üyesi Adı Soyadı	İmzası
Tez Savunma Tarihi :	5.7.2006	
1) Tez Danışmanı :	DOÇ. DR. JALE ORAN	
2) Jüri Üyesi :	YRD. DOÇ.DR. TUBA DUMLU	
3) Jüri Üyesi :	PROF. DR. EROL ÜÇDAL	

1. INTRODUCTION

Corporate growth has the following building blocks: the internal context, the external context, the business concept, resources and capabilities, and strategic investment decisions. The internal concept contains organizational structure, formal systems, corporate values and culture. Corporate growth decisions are influenced by external context such as market structure, macroeconomic environment, rivals, customers and the industry the firm operates. The business concept is the view that a firm has about how to deliver customer value. It encompasses a specific vision about customers' future needs, the role of the firm in serving them, the strategic choices the firm has to make for that purpose, and the unique organization of the different activities in the firm's value chain. Resources are comprised of the firm's assets. Resources need to be combined and deployed to productive uses by managers. Capabilities such as marketing, manufacturing and financial acumen are the capacities that people in an organization have developed over time in combining and deploying resources and defining organizational process. Core capabilities allow a firm to develop certain activities with high level of competence. Also managerial resources are important for growth opportunities and the limits to expansion. Strategic investment decisions are the decisions as to what growth alternatives are chosen and the process by which these decisions are made and implemented that eventually trigger the company's future growth.[1] These decisions are given based on the internal context, external context, business concept, resources and capabilities.

As stated above, growth of a firm depends on many variables. But this study focuses on the financial resources that a firm has in order to finance its growth. Sustainable growth rate is the growth in sales that a firm can support without changing its present mix of liabilities and equity (capital structure).

---

[1] Jordi Canals, **Managing Corporate Growth**, Great Britain, Oxford University Press, 2000, pp.31-50.

Firstly, value based management and sustainable growth rate relation and the actions should be taken when the actual growth rate is different from the sustainable growth rate are given. After that all sustainable growth models in the literature are given:

1- Firm Aggregate Models

2- Firm Disaggregated Models

3- Cash Flow Models

Models and comparison of models with each other are explained. The sustainable growth model, leverage, cost of capital and the value of the firm relations are discussed to achieve optimal sustainable growth rate. The application part tries to find that whether the actual growth rates of firms in Istanbul Stock Exchange are around theoretical sustainable growth rate. And also application part will search and analyze the relation of return on share, and difference between the actual growth rate - sustainable growth rate.

2. SUSTAINABLE GROWTH AND VALUE-BASED MANAGEMENT

The fundamental economic purpose of a corporation is to create wealth for its owners or by the other meaning maximizing the wealth of shareholders. This has become so powerful motivation that one might say that "Create shareholder value" has become management's mantra since the 1990s. Because of the development of analytical techniques based on discounted cash flow analysis, equity spread and economic value added, managers now have an extensive set of tools for determining which parts of their business add or subtract from shareholder value. They can also use these tools to assess the value creation prospects of new strategies or new line business. This value-based thought in the operations of firms form value-based management. The logic of value creation affects the growth plans of firms.[2]

2.1. Value-Based Management

The value of a company is determined by its discounted future cash flows. Value is created only when companies invest capital at returns that exceed the cost of that capital. Value-based management extends these concepts by focusing on how companies use them to make both major strategic and everyday operating decisions. Properly executed, it is an approach to management that aligns a company's overall aspirations, analytical techniques, and management processes to focus management decision making on the key drivers of value.[3] Value-based management brings together the way in which shares are valued by investors with the strategy of the firm, its organizational capabilities and the finance function.[4]

---

[2] Stanley F.Slater and Eric M.Olson, "A Value Based Management System", **Business Horizon**, September-October, 1996, p.48.
[3] Koller Timothy, "What is Value Based Management", **The McKinSey Quarterly**, 1994, Number 3, p.1.
[4] Glen Arnold, **Corporate Financial Management**, 2nd edition, United Kingdom, Prentice Hall, 2002, p.656.

Value-based management is a continuous process. The steps for value-based management is given in figure 2.1. It begins with strategic planning to achieve competitive advantages which produce superior growth in economic profits and returns to shareholders. Strategic planning guides the firm's choice of a product-market scope and its resource requirements, and also it analyzes long term trends, cyclical economic changes, competitive forces, changing economic, cultural, and political environments, effective development of managerial capabilities and other resources. The economic nature of the industry or industries in which the firm operates will be considered in strategic planning. After that coordination and empowerment of work force will be important in order to operate in a way that will create value.[5] A comprehensive value-based management system must engage, motivate and reward the people throughout the organization. The benefit of implementing comprehensive value-based system is that it coordinates and focuses the efforts of the entire work force on activities that will create value for shareholder and for themselves.

Then, based on a business economic analysis of the industry and the firm's competitive position, projections of financial relationships provide a basis for valuation estimates. Since these are subject to error and change, further analysis based on identification of the key drivers of value are made. A value driver is any variable that affects the value of the company. Value drivers need to be organized so that managers can identify which have the greatest impact on value and assign responsibility for them to individuals who can help the organization meet its targets. Value drivers must be defined at a level of detail consistent with the decision variables that are directly under the control of line management. The value drivers are not static and not isolated from each other. In seeking to understand the interrelationships among value drivers, scenario analysis is a valuable tool. It is a way of assessing the impact of different sets of mutually consistent assumptions on the value of a company or its business units.

[5] Samuel C. Weaver and J. Fred Weston, "A Unifying Theory of Value Based Management", *Finance* Paper 4-03., 2003,http://repositories.cdlib.org/anderson/fin/4-03 (02.04.2006), p.2.

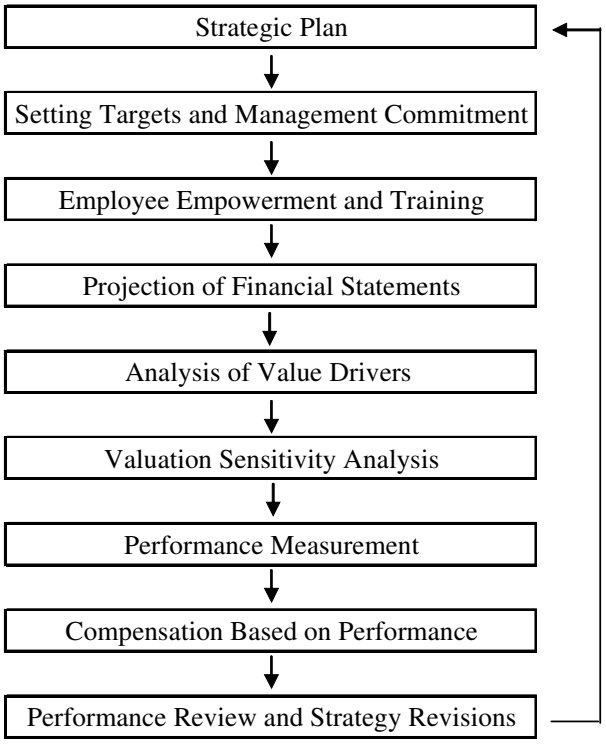

Figure 2.1. Steps of Value-Based Management

The performance can be measured according to alternative measurement techniques. There are multiple methods of performance measurements are widely used in the literature.

- Discounted cash flow (DCF) valuation using intrinsic value analysis (IVA)
- Returns to Shareholders (RTS)
- Economic Profit (EP) or Economic Value Added (EVA)
- The relationship between the market value of the firm's financial instruments and the book value of the firm's operating assets. This relationship has been variously called market value added (MVA), and the market-to-book ratio.

In theory the four alternative methods are somewhat different. In practice, the implementations have similarities in methodology and coverage. They all center on

strategic financial planning and appear to make valuable contributions to performance improvement and to value creation.

Compensation systems should be linked to performance measurements. Lastly, periodic reviews lead to strategy revisions as well as to changes in policies and operations. Feedback from all steps will be used to revise strategic plan to increase value.

2.1.1 Sustainable Growth Rate and Value-Based Management

If the objective in corporate finance is the maximization of firm value, then the relationship between financial decisions, corporate strategy and firm value has to be analyzed. The value of the firm can be directly related to decisions that it makes-on which projects it takes, on how it finances them, and on its dividend policy. Understanding this relationship is the key to making value-increasing decisions and to sensible financial restructuring.[6]

Growth is not a necessary or sufficient condition for an increase in shareholder value. Some firms that use excessive debt to support high growth have suffered financial distress. Unless the firms can manage high growth, the value of the firm will diminish. So high growth can lead a decrease or increase in value. Only balanced growth will lead an increase in value. Managers must asses the effect of external and internal factors on sustainable growth to maximize value of firm. Same growth rate may cause a decrease or increase in value. The crucial point is the evaluation of effects of this growth on financial and operating factors. Focusing only on growth will cause financial distress, decrease in value or bankruptcy. Sustainable growth rate focuses on the relation between growth in sales and financial resources. *"Sustainable growth rate is the maximum rate at which company sales can increase without depletion financial resources."*[7] Managers must face the fact that uncontrolled growth may be inconsistent with the strategic plan. Growth plans will be done in a way that is consistent with value-

[6] Aswath Damodaran, **Investment Valuation Tools and Techniques for Determining the Value of Any Asset,** University Edition, USA, John Wiley & Sons Inc., 1996, p.7.
[7] Robert C.Higgins, **Analysis for Financial management**, 2nd edition, USA, Irwin Homewood Illinois, 1989, p.106.

based management perspective. So that growth objectives and financial policies will be mutually feasible to achieve an increase in value of the firm. Only sustainable growth rate consistent with the strategic plan in value-based management can increase long-term firm value.

2.1.2. Valuation and Sustainable Growth Rate

Basic approach for the valuation is discounted cash flow technique. This approach is based on the present value approach. Expected cash flows are discounted by the required rate of return for the given period. There are two paths to discounted cash flow approach. The first is to value the equity and the second is to value the entire firm. Cash flow to equity and cash flow to firm are different; also the required rate of return for each is different. The cash flow to equity approach focus on the right hand side and attempt to value the firm's equity and its liabilities and then sum the two estimates to get firm value. The cash flow to firm approach involves estimating the value of the firm as an entity. Also the value of the firm can also be written as the sum of the value of the unlevered firm and the effects of debt.

A firm with free cash flows to the firm growing at a stable growth rate can be valued using the following model:

Value of firm = $FCFF_1$ / (WACC - g_n)

$FCFF_1$ = Expected FCFF next year

WACC = Weighted average cost of capital

g_n = Growth rate in the FCFF (forever)

FFCF = Net income + Depreciation – Capital Expenditures - Δ Working Capital

The sustainable growth rate that is calculated from one of the models which are explained in part three can be used in valuation of the firm in the place growth rate in the free cash flow to firm. Net income of the next year can be calculated by using the sustainable growth rate so net $income_1$ will be [net $income_0$ x $(1+g^*)$] . Also the

sustainable growth assumes that assets-sales ratio is constant. Increase in sales will lead to a same proportion increase in assets and so in depreciation.[8] The assumptions of sustainable growth rate establish a relation between growth rate, profit and depreciation. If any relation like that can be established between growth, capital expenditures and change in working capital, the model would be more complex. In the following model, it is assumed that capital expenditures and change in working capital is zero

$$\text{Value of firm} = \frac{(P_0 S_0 + Depreciation_0)(1+g^*)}{WACC - g^*} = \frac{FCFF_1(1+g^*)}{WACC - g^*}$$

The stable sustainable growth rate used in formula must be reasonable, extreme growth rates can not be continued so value of firm will be wrong. Companies which are in their start-up phase or have high growth will typically have negative free cash flows or free cash flows that exhibit temporary high growth. The negative free cash flows means the company is obtaining new funds from investors. In this situation this model cannot be used.[9]

Also relation of sales with other variables must be well analyzed. If the assumptions hold and firm's actual growth rate is equal to sustainable growth rate, expected value of firm will be achieved. If the firm grows at a different rate than its sustainable growth rat or the assumptions of the model do not hold, the actual value of the firm would be different than the expected.

2.2 Sustainable Growth

Although it is difficult to view growth as anything but good for a company's future, uncontrolled or unmanaged growth can be devastating to its future. Growth and management of growth is crucial for firms especially in financial planning step. Growth should come in a manageable, well-thought-out manner that is consistent with an organization's stated strategic goal. There is no one-size-fits-all strategy for managing growth. Creating an effective plan depends on a host of factors, including many that

[8] İ.Melih Baş and M.Ali Seyhun, "İşletmelerde Sürdürülebilir Büyüme", **İşletme ve Finans**, Eylül 1993, Sayı:90, p.47.
[9] Nancy L Beneda, "Estimating Free Cash Flows and Valuing a Growth Company", **Journal of Asset Management**, Dec 2003; 4, 4, p. 247.

rely on each company's situation. Finance executives play a key role in managing their companies' growth — from raising capital to fuel expansion to reining in overly ambitious plans that could cause the company to overheat. Finance executives need to know when to do both, while also supporting the type of growth that is in the company's long-term best interests.[10]

Managers must face the fact that unrestrained growth may be inconsistent with the established financial policies. It may come as a surprise to some that excessive growth in sales can sometimes be more threatening to the survival of the firm than no growth. People think that when growth increases, the market share and profits should rise as well so "growth" should be maximized. But in some cases growth can be limited. From a financial perspective growth is not something to be maximized and always blessing. Rapid growth can put limits on company's resources unless management is aware of that threat and takes necessary steps to control it. Firms can go bankruptcy as a result of growing too fast or too slowly.

If the firms grow too fast as a result of providing products demanded by market, the firm would fail unless the growth is backed with required financial and managerial steps. When sales grow at a higher rate, firms would choose to increase debt, reduce dividend, issue securities or mix of them in order to finance increase in sales. These actions will affect financial policies. Only if the productivity of inputs can increase and management takes necessary actions, higher profits margins can be reached.

At the other spectrum, firms that grow the slowly would face financial problems such as lack of meeting the investments spending or threat of takeover. If the sustainability is known, management can evaluate whether the firm's growth objectives and financial policies are mutually feasible or management can reassess these objectives and set a more appropriate mix of growth and financial objectives.

Sustainable growth rate is the maximum rate at which company sales can increase without depletion financial resources. For the companies that want to maintain

[10] Joanne Sammer, "More, Please! Part Two of a Series", **Business Finance**, July 2000, p.57.

a target payout ratio and capital structure without issuing new equity, sustainable corporate growth is defined as the annual percentage of increase in sales that is consistent with the firm's established financial policies. The management would not focus on maximizing growth. The purpose of the management is maximizing the wealth of shareholders and this can be achieved by the financial structure that minimizes the weighted average cost of capital. Sustainable growth rate that is consistent with the maintenance of the minimum cost of capital would be the optimal sustainable growth rate. Otherwise the optimal growth rate and sustainable growth rate would not match. This will be discussed later.

2.2.1. The Sustainable Growth Equation

Assumptions:

- The company wants to grow as rapidly as market conditions permit
- Management is unwilling or unable to sell new equity
- The company has a target capital structure (T) and a target dividend policy (D) that it wants to continue

Derivation of Formula:

- P = Profit margin
- A = Asset turnover ratio
- T = Target financial leverage (Assets/Equity = 1+L)
- R = Target earnings retention ratio (1-D)
- S = Annual sales

ΔS = Increase in sales

$$A = \text{Asset turnover} = \frac{net\ sales}{total\ assets} = A = \frac{S_0}{TA_0}$$

$$S_0 + \Delta S = S_1$$

Assume that A is constant that means increase in sales requires increase in assets. Also the firm is not selling new equity so increase in assets will be financed by retained earnings and additional borrowings.

$$\frac{S_0}{total\ assets} = \frac{S_0 + \Delta S}{new\ assets} \longrightarrow \frac{S_0}{TA_0} = \frac{S_0 + \Delta S}{TA_0 + \Delta TA}$$

$$(TA_0 + \Delta TA)S_0 = TA_0(S_0 + \Delta S)$$

$$TA_0 S_0 + \Delta TAS_0 = TA_0 S_0 + TA_0 \Delta S$$

$$\Delta TAS_0 = TA_0 S_0 + TA_0 \Delta S - TA_0 S_0$$

$$\Delta TAS_0 = TA_0 \Delta S$$

$$\Delta TA = \frac{TA_0 \Delta S}{S_0}$$

$$\Delta TA = \frac{TA_0}{S_0}\Delta S = \frac{1}{A}\Delta S = \frac{\Delta S}{A}$$

Retained profits = P x (1-D) = Profit margin x net sales x retention ratio

Use of funds (increase in assets) = Sources of funds (debt and equity)

$$\frac{\Delta S}{A} = \text{(P x R x S) + (R x P x S) (T-1)}$$

$$\frac{\Delta S}{S} = \text{R x P x S x T so } g^* = \text{P x R x A x T}$$

If the actual growth is different from the sustainable growth, management needs to analyze the situation and take necessary steps to control the situation.

2.2.2. Strategies When Actual Growth Exceeds Sustainable Growth

The first is to determine how long the situation will continue. If the firm's growth rate likely to decrease in near future, problem is temporary and can be solved by additional debt. When the actual growth is lower than the sustainable growth, the firm will be a cash generator and loans will be paid.

But for longer-term sustainable growth problems, companies need to manage their growth. Managers must build an organizational infrastructure, not just in accounting and finance but in legal and human resources. The firms must adapt one of the following strategies or combination of them in order to control growth.

2.2.2.1. Sell New Equity

If the actual growth exceeds sustainable growth the firms will need additional funds. Firm can solve this problem by selling new equity. The increase equity and also additional borrowing are the sources of cash to finance growth. But selling new equity is not available for many companies and unattractive to many others. In many countries, equity markets are poorly developed or nonexistent. The investors will not choose the buy new shares because without active stock market trading of shares investors will be owners of illiquid securities. So for firms, this process will be difficult and costly.

Also in countries with well-developed stock markets, many companies find it difficult to raise new equity. Timing of issuing, loss of voting controls, transaction and registering costs are the main reasons for that. Firms choose retained earnings or new borrowing.

2.2.2.2. Increase Leverage

When selling new equity is not an option to fix sustainable growth problems, there are tow more options. One is to cut the dividend payout ratio and the other is to increase leverage. Increasing leverage raises the amount of debt the company can add for each dollar of retained profits. But there are limits of debt financing. Because more debt causes more risk.

2.2.2.3. Decrease Payout Ratio

There is an upper limit for leverage and there is a lower limit of zero to dividend payout ratio. Investors' reaction to decrease in dividend payout ratio varies. If the investors believe that retained (undistributed) profits can be used for productive opportunities, they will forgo today's dividends for higher future dividends. Otherwise the stock of prices decline will decline sharply.

2.2.2.4. Profitable Pruning

Many companies solve their growth problems by reducing payout ratio and selling new equity. But some firms can solve this problem differently. They stop thinking about growth as a beneficial and see it as a variable that must be controlled in a manner that is inconsistent with the inventories, payout ratios or accounts payable. Rather than thinking about L, D, T and P so g* theses firms plan to reduce g itself.[11]

Profitable pruning sells off marginally performing operations to invest the money into the remaining businesses. This approach recognizes that when a company spreads its resources across too many products, it may be unable to compete effectively in any. Profitable pruning reduces sustainable growth problems in two ways: it generates cash directly through the sale of marginal businesses, and it reduces actual sales growth by eliminating some of the sources of the growth. Profitable pruning can also be applied to a single-product company. In this case, slow-paying customers and/or slow-turning inventory are eliminated. This can eliminate sustainable growth problems in three ways: It frees up cash; it increases asset turnover; and it reduces sales.

Some companies can perform well and grow in some different businesses. But the resources are limited. Spreading resources across many products can decrease competition power. Marshalling resources in a few chosen businesses where the firm believed it could compete most effectively can solve sustainable growth problems. Short-term sales can be sacrificed for a strong financial structure to achieve long-term profitability.

[11] Higgins, **Analysis for Financial management,** p.120

Conversely, some can think firms can go businesses in different sectors and go product differentiation. The income streams of businesses are not affected in exactly the same way by economic events. So the variability in each income stream is offset with the others. But in this strategy the firm distributes its resources and the competitive power decreases. The firm will have less market share in many markets.

By profitable pruning firms will focus on their main activities and competitive power will increase. As a result of eliminating the some sources of growth, sales growth will be controlled. Profitable pruning should increase profit margin and decreases t so g is reduced. By concentrating financial resources where they can be used most effectively, g and g* can be balanced

2.2.2.5. Outsourcing

Outsourcing is the decision of whether to perform an activity in the firm or to purchase it from another firm. A firm can increase sustainable growth rate by outsourcing more. So some assets in the firm are released and asset turnover ratio increases. Also by outsourcing, the firm implements downsizing strategy and focuses on its core competencies.[12]

2.2.2.6. Pricing

When the growth is higher than the company's financial resources, price increase will be a solution to reduce growth. Increase in prices Also if higher prices increase profit margin, sustainable growth rate will rise.

2.2.2.7. Downsizing

The size of the organization is a factor that affects the structure and processes of it. Growth is a multi-dimensional concept, which can be measured by increase in market share, increase in profit margin or rise in number of workers. Generally growth is perceived as a good whereas downsizing perceived as bad. But recently, this view has been changing. Downsizing is the systematic decrease in number of workers and

[12] Tamer Koçel, **İşletme Yöneticiliği**, 7.baskı, İstanbul, Beta Yayınları, 1999, ss.299–300.

managers in order to gain competitive and cost advantage. So that the organizations gain flexibility and power of fast response to changes. But this strategy can create pressure on the workers. As a result of downsizing, all levels in the organization come closer and the interaction between levels strengths. Decentralized management approach is implemented so decision-making authority is expanded to all levels. All this results creates competitive and cost advantages to the organization. So the growth can be controlled, profit margins can be increased, if needed more debt can be used to finance theses developments.[13]

2.2.2.8. Merger

Another strategy for balancing actual growth and sustainable growth rate is searching for a new partner. Two types of companies are capable of supplying the needed cash. One is a mature company, known in the trade as a "cash cow", looking for profitable investments for its excess cash flow. The other is a conservatively financed company that would bring liquidity and borrowing capacity to the marriage. The advantages of horizontal, vertical or conglomerate mergers can solve the growth problems.[14]

2.2.3. Strategies When Actual Growth Is Lower Than Sustainable Growth

Not only growing faster than sustainable growth is a problem but also growing lower than sustainable growth is a problem. When the sustainable growth rate exceeds actual growth rate, firm must take some steps. Fast growing companies are struggling for cash whereas the slow growing companies face the problem of what to do with excess cash.

First of all, the low growth situation must be analyzed if this is temporary or long-term. If the situation is temporary, the company can ignore the problem and continue collecting cash for future growth. If the situation is long-term, the reason

[13] İsmail Efil, **İşletmelerde Yönetim ve Organizasyon**, 7.Baskı, İstanbul, Alfa Yayınları, 2002, p.388.
[14] Haluk Sümer and Helmut Pernsteiner, **Şirket Birleşmeleri**, 1.Baskı, İstanbuş, Alfa Yayınları, 2004, pp.594-595

should be searched. The slow growth can result from the growth decrease in the industry or the company itself.

If the slow growth problems occur from the industry, the reason for slow growth and new sources of growth will be searched within the firm. Management should take necessary steps such as organizational changes, R&D expenses for future growth.

Management can ignore the problem and continue investing in its core business so that the company loses new attractive returns. But the resources of the company will idle. Poorly used resources will decrease the stock prices and make it easy for raiders to take the control. The solution for the use of idle resources is increasing dividend payout ratio or repurchasing stocks.

Firms can choose franchising strategy to increase to increase growth. Franchising is a method of doing business wherein a franchisor licenses trademarks and methods of doing business to a franchisee in exchange for a recurring royalty fees. It is a method for distributing products and services that satisfy customer needs. Franchisor's advantages include; opening quicker, experiencing success sooner, developing a customer base faster, having less risk and being more profitable.[15]

The threat of take over and concern for utilizing resources by growth opportunities force managements to go diversification. Management can search for new growth opportunities in mature or vibrant industries. The easiest way of this is acquiring. In an acquisition, the management must choose the firm with growth opportunities and consistent with managerial skills. The acquisition price and the adaptation of the new firm to existing operations will be crucial.

[15] Robert Gappa, *What is franchising?*.
http://www.franchising.com/fuadmin/articles/article_WhatisFranchising3.shtml (01.10.2005)

3. SUSTAINABLE GROWTH MODELS

3.1 Firm Aggregate Models

3.1.1 The Higgins Model

"In 1977 and 1981 Robert C.Higgins demonstrated that the financial policies of many corporations might be at variance with their growth objective. As a guide for setting compatible financial policies and growth objectives, Higgins developed a formula to calculate a rate of sustainable growth. In deriving his formula Higgins made the following assumptions:

1. *Book depreciation is adequate to recapture the value of existing assets;*

2. *Profit margin (P) on new sales (S_1) corresponds to that on existing sales (S_0); hence the change in sales (ΔS) equals $S_1 - S_0$*

3. *The firm has an established financial structure (L) without the sale of new common stock. The financial structure is the total of all debt and equity financing current and long-term assets;*

4. *The firm has an established dividend payout rate (D); thus the target retention ratio is (1-D)*

5. *New fixed assets (F) at book value represent a stated proportion of the change in physical volume of output (real estate);*

6. *New current assets (C) are a stated proportion of sales in nominal dollars;*

7. *Sales at the beginning of the period are represented by (S_0) and the projected sales during the period by (S_1);*

8. T denoted the ratio of total assets to net sales, and the ratio is constant for new and existing sales;

9. *Firm will rely on retained earnings for equity financing, and new common stock will not be issued."*[16]

As a result of basic accounting principle assets must be equal to debt plus shareholders' equity. So additions to assets resulting from the increase sales must be financed by an increase in retained earnings and new debt. Derivation of the formula shows this equality and the derivation of the sustainable corporate growth formula. If the actual growth rate (g) is different from the sustainable corporate growth (g^*), the firm will have to revise its financial policies or the firm can disregard the situation and fail to meet its financial objectives.

If $g>g^*$ the firm may increase leverage, decrease dividend payout ratio. Another solution is selling new equity, but especially for small and medium sized companies it is costless and difficult to sell new equity. The reasons for not choosing to sell new equity are timing of issuing, loss of voting controls, transaction and registering costs, underwriting and selling issue, under-pricing costs are some. Especially in less developed and developing countries capital markets are not well developed. Not only small-medium sized companies but also big companies face with these problems. Also managers believe that common shares are undervalued and the firms are unwilling to make growth plans predicted on extensive use of equity.

The third assumption can be seen unrealistic. But IOMA's report shows that the internal resources are ideal. The vast majority 89,8% of readers plan to finance growth with internal cash flow or cash on hand, 38% of readers plan to use bank borrowing and financing, 7,3% choose leasing and only 1,5% choose new stock issue.[17] Also the cost of going public is substantial, both initially and on an ongoing basis. As for the initial

[16] John J.Clark, Thomas C.Chiang and Gerard T.Olson, **Sustainable Corporate Growth A Model and Management Planing Tool**, USA, Quorum Books, 1989, p.28.
[17] IOMA's Report on Financial Analysis, Planning & Reporting, **How Companies will Finance Growth Plans for 2006 Anonymous,** Jun 2005; 05, 06, p.1.

costs, the underwriters discount or commission can run as high as 10 percent or more of the total offering. Additionally firm can incur out-of-pocket expenses, which typically range from $150,000 to $500,000 for even a small offering of $10 million. If IPO is canceled at the last minute because of adverse market conditions or other reasons, firm will be liable for substantial costs.[18]

If $g<g^*$ the firm may have excess cash and is under-investing. So leverage can be decreased, fixed assets and dividend payout ratio can be increased.

3.1.1.1 Higgins Sustainable Growth Formula without Price Changes

$$\mathbf{g}^* = \frac{\Delta S}{S_0} = \frac{(1-D)\ P\ (1+L)}{[T-(1-D)\ P\ (1+L)]}$$ [19]

3.1.1.2 Derivation of Higgins Model without Price Changes

$$\mathrm{T} = \frac{totalassets}{netsales} = \frac{A_0}{S_0} = \frac{A_1}{S1} \qquad \mathrm{L} = \frac{debt}{equity}$$

New assets required to support increase sales

$$A_0 \times S_1 = A_1 \times S_0$$

$$= \frac{A_0 \times S_1}{S_0} - A_0 = \frac{A_0 \times S_1 - A_0 \times S_0}{S_0} = \frac{A_0(S_1 - S_0)}{S_0}$$

$$= \frac{A_0}{S_0} \times (S_1 - S_0) = T \times \Delta S$$

Balance Sheet

Increase in assets →

$\Delta S\ T$	$(\Delta S + S_0)\ P\ (1\text{-}D)\ L$ ← Every $1 added to R.E. enables company to borrow $L without increasing L
	$(\Delta S + S_0)\ P\ (1\text{-}D)$ ← Additions to R.E.

Assets = Debt + Shareholders' equity

[18] *Going Public Disadvantages*, http://www.penn-capital.com/english/gp-disadvan.html (01.11.2005)
[19] Clark, Chiang and Olson, p.29.

$\Delta S\ T = (\Delta S + S_0)\ P\ (1\text{-}D)\ L + (\Delta S + S_0)\ P\ (1\text{-}D)$

$\Delta S\ T = [(\Delta S + S_0)\ P\ (1\text{-}D)]\ (1+L)$

$\Delta S\ T = (\Delta S + S_0)\ [P\ (1\text{-}D)\ (1+L)]$

$\Delta S\ T = \Delta S\ P\ (1\text{-}D)\ (1+L) + S_0\ P\ (1\text{-}D)\ (1+L)$

$\Delta S\ T - \Delta S\ P\ (1\text{-}D)\ (1+L) = S_0\ P\ (1\text{-}D)\ (1+L)$

$\Delta S\ [T - P\ (1\text{-}D)\ (1+L)] = S_0\ P\ (1\text{-}D)\ (1+L)$

$$\mathbf{g}^* = \frac{\Delta S}{S_0} = \frac{(1-D)\ x\ P\ x\ (1+L)}{T - [(1-D)\ x\ P\ x\ (1+L)]}$$

3.1.1.3 Higgins Sustainable Growth Formula with Price Changes

When the price changes are taken into account, the formula will be modified. The impact of price changes on sustainable corporate growth will depend on; the degree that price variations affect specific revenue and expense items; the mix of fixed and variable costs; and whether the annual depreciation is sufficient to maintain the replacement value of existing assets. The firm will analyze the impact of change in price level on nominal and real sustainable growth rate.

3.1.1.4 Derivation of Higgins Model with Price Changes

Balance Sheet

$[(S_0+\Delta S)\ (1+J) - S_0]\ C$	$(S_0+\Delta S)\ (1+J)\ P\ (1\text{-}D)\ L$
$\Delta S\ F$	$(S_0+\Delta S)\ (1+J)\ P\ (1\text{-}D)$

Assets = Debt + Shareholders' equity

$[(S_0+\Delta S)\ (1+J) - S_0]\ C + \Delta SF = (S_0+\Delta S)\ (1+J)\ P\ (1-D) + (S_0+\Delta S)\ (1+J)\ P\ (1-D)\ L$

$\Delta S\ [(1+J)\ C + F] + JCS_0 = (S_0+\Delta S)\ (1+J)\ P\ (1-D) + (S_0+\Delta S)\ (1+J)\ P\ (1-D)\ L$

$\Delta S\ [(1+J)\ C + F] + JCS_0 = [(S_0+\Delta S)\ (1+J)\ P\ (1-D)]\ (1+L)$

$\Delta S\ [(1+J)\ C + F - (1+J)\ P\ (1-D)\ (1+L)] = S_0\ [(1+J)\ P\ (1-D)\ (1+L)] - JCS_0$

$\Delta S\ [(1+J)\ C + F - (1+J)\ P\ (1-D)\ (1+L)] = S_0\ [(1+J)\ P\ (1-D)\ (1+L) - JC]$

$$\mathbf{g}^* = \frac{\Delta S}{S_0} = \frac{[(1+J)\ x\ P\ x\ (1-D)\ x\ (1+L)] - J\ x\ C}{[(1+J)\ x\ C + F] - [(1+J)\ x\ P\ x\ (1-D)\ x\ (1+L)]}$$

3.1.2 The Johnson Model

Higgins model in changing prices depends on the assumption that new financing from long-term debt and current liabilities is a constant proportion of the new level of nominal sales rather than of the change in nominal sales. While this may be an appropriate assumption concerning the change in long-term debt, it may not be a very realistic one about the behavior of current liabilities in an inflationary environment. Just as current assets do, total nominal current liabilities spontaneously increase in response to an increase in nominal sales. For a given increase in nominal sales, the increase in nominal current liabilities is seldom considered discretionary, but instead automatically arises from the corresponding purchases of materials on credit, accrued labor charges, and drawing down lines of credit in the ordinary course of producing for this new nominal sales level. In contrast, the issuance of long-term debt is generally a conscious or discretionary decision. The dollar amount of long-term debt raised may be assumed to bear a target proportion of the increase in retained earnings. To derive the real sustainable growth rate with a constant capital structure (long-term debt-to-equity ratio) rather than financial structure (total debt-to-equity ratio), all the assumptions of the real sustainable growth model are maintained except assumption concerning a target total

debt-to equity ratio, L. Instead, total nominal current liabilities are assumed to be a proportion of nominal sales.[20]

So Johnson assumes a constant capital structure (L_L = Long-term debt / Equity) while Higgins assumes a constant financial structure (L = Debt / Equity). The Higgins Model use increase in assets (ΔS x T) as total use of funds but the Johnson Model divide these increase into two parts change in nominal currents assets and new nominal fixed assets. Johnson Model assumes that working capital floats with nominal sales. New sources of funds include changes in net working capital plus increases in long-term debt and additions to retained earning. So constant Long-term debt / Equity ratio is sustained. W is the ratio of nominal net working capital to nominal sales.

Balance Sheet

$[(S_0+\Delta S)(1+J) - S_0]\,W$	$(S_0+\Delta S)(1+J)\,P\,(1-D)\;L_L$
$\Delta S\,F$	$(S_0+\Delta S)(1+J)\,P\,(1-D)$

Assets = Debt + Shareholders' equity

$$[(S_0+\Delta S)(1+J) - S_0]W + \Delta SF = (S_0+\Delta S)(1+J)\,P\,(1-D) + (S_0+\Delta S)(1+J)\,P\,(1-D)\,L_L$$

$$\Delta S\,(1+J)\,W - JWS + \Delta SF = (S_0+\Delta S)(1+J)\,P\,(1-D) + (S_0+\Delta S)(1+J)\,P\,(1-D)\,L_L$$

$$\Delta S\,[F - (1+J)(1-D)\,P\,(1+L)] = S\,[(1+J)\,P\,(1-D)\,(1+L_L) - WJ]$$

$$\mathbf{g}^* = \frac{\Delta S}{S_0} = \frac{[(1+J)\;x\;P\;x\;(1-D)\;x\;(1+L_L)] - W\;x\;J}{F - (1+J)\;x\;(1-D)\;x\;P\;x\;(1+L_L)}$$

And if the corporate income tax is taken into account, profit margin and dividend ratio will be affected by tax rate. After tax profit margin and dividend ratio will change.

[20] Dana J. Johnson, "The Behavior of Financial Structure and Sustainable Growth in an Inflationary Environment", **Financial Management**, Autumn 1981, pp.30-35.

3.1.3 Sustainable Growth Rate and Inflation

Nominal sales growth can come from increasing physical volume and/or increasing prices. Higgins argues that current assets increase with increase in nominal sales whereas Johnson distinguishes between long term liabilities and current liabilities under inflation. Both models ignore the effect of inflation on fixed assets. Johnson model shows that sustainable growth rate has no exact relation with inflation, but Higgins model says that inflation has an adverse effect on sustainable growth rate.

Inflation adversely affects corporations in several ways. One that is well known by now relates to the fact that the depreciation in most countries must be based on historical cost of assets rather than on their current replacement cost. Because historical depreciation is below replacement cost depreciation during inflationary periods, that portion of cash from operations represented by depreciation is insufficient to recover fully the economic value of the depreciating assets. In addition the asset erosion, historical depreciation also results in higher taxable earnings than does replacement cost depreciation, and naturally higher tax bills as well. Because taxable income is overstated, executives rightfully argue that they are taxed on capital as well as profits during inflation. The real rate of return on new corporate investment declines, making expansion less attractive[21].

Another problem in inflationary periods is the increases in working capital. If the company's goal is to sell the same number of products annually, it must invest larger amount of money in accounts receivable and inventory. So this increase in assets is offset by increase in accounts payable. As a result nominal profits increase but these seldom cover the full amount. The remained part must be financed by outside resources.

The capital intensity of the firm's production process and the longevity and vintage of the capital stock determines the impact of historical cost depreciation. According to the study of Robert C.Higgins real sustainable growth rate declines by 2.2% for every 5 percentage increase in the inflation rate.

---

[21] Robert C.Higgins, "How Much Growth Can a Firm Afford", **Financial Management**, Fall 1977,6, 3, p.7.

Inflation may have a substantial depressing effect on economic growth. Companies experiencing difficulty financing growth in the absence of inflation will find that inflation force them to choose between increased leverage or reduced real growth. To the extent that companies reduce real growth in response to falling sustainable growth rates, economic growth will suffer.[22]

Also Dana Johnson distinguishes the behavior of current and long-term liabilities under inflation. Current liabilities vary with nominal sales but where management constrains long-term liabilities to be a constant fraction of the book value of equity. So in some cases real sustainable growth rate can be different from Higgins models and also sometimes real sustainable growth rate can be independent of the rate of inflation or vary inversely. The main errors of the two models are the ignorance of effect of inflation on fixed assets, the independency of current liabilities and long-term liabilities and the most important one is the poor measurement of historical balance sheet ratios of capital structure.

3.1.4 Application, Comparison and Summary of Sustainable Corporate Growth Theories

Johnson's model distinguishes the effect of increase in sales on the current and fixed assets whereas Higgins assumes that total assets vary with sales. Another basic difference is that Higgins use Debt/Equity (L), and Johnson use Long Term Debt/Equity (L_L) in formulas.

The difficulty with Higgins and Johnson models is their heavy reliance on accounting numbers, which are subject to the exercise of a variety of options. Accounting numbers are historic in nature and reflect transactions executed at different price levels. Accounting date lags price trends, on both the upside and downside.[23]

Higgins and Johnson Models are applied to Nuh Çimento A.Ş. for years 2002 and 2001. Balance sheet and income statement of Nuh Çimento is given in Table 3.1,

[22] Robert C.Higgins, "Sustainable Growth Under Inflation", **Financial Management,** Autumn 1981; 10,4 p.36.
[23] John J.Clark, Margaret T.Clark and Andrew G.Verzilli, "Strategic Planning and Sustainable Growth Fall", **Columbia Journal of World Business**, 1985, p.51.

ratios related to the calculation of models are given in table 3.2 and results of models are given in table 3.3. The firm's sustainable growth rates and actual growth rates are different. The reason for this difference is the change in return on equity and retention ratio. Also the high inflation rates in Turkey increase the actual growth in sales.

In both cases (a target financial structure and a target capital structure) the sustainable growth rate is lower under rising prices than under conditions of price stability. The reason for this phenomenon lies in the historical cost financial statements used to describe financial or capital structures and to set target ratios. It follows that in the face of persistent inflation, management can maintain a stable capital structure over time only by using a constant dollar debt-equity ratio or one based on market values.[24] In decreasing prices condition, sustainable growth in two models increases.

Table 3.1

Brief Financial Statements of Nuh Çimento Sanayii A.Ş for 2002 and 2001

NUH ÇİMENTO SANAYİ A.Ş.		
BALANCE SHEET (YTL)		
ASSETS	**31.12.2002**	**31.12.2001**
CURRENT ASSETS	85.066.549	55.636.695
FIXED ASSETS	95.146.876	73.990.575
	180.213.425	129.627.270
LIABILITIES & SHAREHOLDERS' EQUITY	**31.12.2002**	**31.12.2001**
SHORT - TERM LIABILITIES	33.097.698	27.183.365
LONG – TERM LIABILITIES	17.866.094	14.834.185
SHAREHOLDERS' EQUITY	129.249.633	87.609.720
	180.213.425	129.627.270
INCOME STATEMENT (YTL)		
NET SALES	127.370.120	86.280.330
NET PROFIT	26.860.850	12.403.215

Resource: www.imkb.gov.tr/malitablo.htm

The tables 3.4 and 3.5 show the effects financial policies on sustainable corporate growth. Ignoring inflation, assume that P and T are constant in table 3.4. In order to

[24] Clark, Chiang and Olson, p.37.

increase g* the dividend ratio must be decrease or leverage must be increased. But added debt result more risk so the interest rate increases. Decrease in dividends is bad for investors.

Table 3.2

Financial Ratios of Nuh Çimento for Sustainable Growth

RATIOS		
P = PROFIT MARGIN	0,2109	0,1438
T = TOTAL ASSETS / NET SALES	1,4149	1,5024
L = DEBT / EQUITY	0,3943	0,4796
1+L	1,3943	1,4796
DIVIDENDS PAID (YTL)	17.274.564	10.341.027
D = DIVIDENT PAYOUT RATIO	0,6431	0,8337
(1-D) = RETENTION RATIO	0,3569	0,1663
C = CURRENT ASSETS / NET SALES	0,6679	0,6448
F = FIXED ASSETS / NET SALES	0,7470	0,8576
W = WORKING CAPITAL / NET SALES	0,4080	0,3298
LL = LONG TERM DEBT / EQUITY	0,1382	0,1693
$1+L_L$	1,1382	1,1693
J	5%	5%

Table 3.3

Sustainable Growth Rates for Nuh Çimento

SUSTAINABLE GROWTH RATES for NUH ÇİMENTO SANAYİ A.Ş.		
Model	**2003**	**2002**
SGR - Higgins model	8,011%	2,411%
SGR – Higgins model (rising prices) (5%)	5,7390%	0,3266%
SGR - Higgins model (decreasing prices) (5%)	10,383%	4,583%
SGR - Johnson Model	33,816%	5,591%
SGR – Johnson Model (rising prices)(5%)	30,418%	2,660%
SGR - Johnson Model (decreasing prices)(5%)	36,611%	8,336%
ACTUAL GROWTH in SALES in 2002	47,624%	
ACTUAL GROWTH in SALES in 2003	7,87%	
NET SALES in 2003	137.399.644 YTL	

When L is 30%, P is 5,5%, T is 73% and D is 52%, sustainable growth rate is 5%. As the payout ratio decreases from 52% to 26%, g* becomes only 7,8%. The effect of changes in payout ratio is low.

In table 3.5 when P, D and L are constant, decrease in T results an increase in g*. Conversely when the T, D, L is constant, increase in P results an increase in g*. So there is a linear relation between the P and T. But the relation of D and L is non-linear.

Table 3.4

Effect of Leverage and Dividend Payout Ratio on SGR

Higgins Model (no price changes)				
D (dividend payout ratio)	**Leverage (Debt/Equity)**	**P**	**T**	**g^*(%)**
0,37	0	0,055	0,73	5
0,52	0,3	0,055	0,73	5
0,33	0,88	0,055	0,73	10,5
0,21	0,6	0,055	0,73	10,5
0,28	0,75	0,055	0,73	10,5
0	0,75	0,055	0,73	15
0,135	1	0,055	0,73	15

Table 3.5

Effect of Profit Margin and Assets/Sales on SGR

Higgins Model (no price changes)				
D (dividend payout ratio)	**Leverage (Debt/Equity)**	**P**	**T**	**g***
0,33	0,88	0,05	1,32	0,05
0,33	0,88	0,05	0,73	0,1
0,33	0,88	0,05	0,48	0,15
0,33	0,88	0,028	0,73	0,05
0,33	0,88	0,053	0,73	0,1
0,33	0,88	0,076	0,73	0,15

3.1.5 Affordable Growth Rate

Charles W.Kyd used the term "affordable growth" for balanced growth whereas Higgins and Johnson used the term "sustainable growth". Kyd defines the affordable growth rate as the annual percentage increase in sales which a firm can maintain while keeping its capital structure in balance and that is equal to the annual percentage increase in firm's stockholders' equity section of its balance sheet.[25] This model was firstly developed and implemented by Hewlett Packard successfully. Kyd generalized and expanded the model. The basic equation is:

$$g^* = \frac{Earnings\ after\ dividends}{Beginning\ Stockholders'\ Equity} = \frac{earnings\ (1-D)}{Beginning\ Stockholders'\ Equity} = ROE\,(1-D)$$

The main assumptions of this model are assets grow at the same rate with sales, the firm has a targeted debt to equity ratio and profits after dividends are the only additions to equity. Assets will grow as the same rate with sales only if the firm is operation at full capacity. Small-medium firms make investment on when they exceed their capacity because these firms generally operate at full capacity. Firms prefer and try to maintain a stable debt to equity ratio. Also additions to equity are possible with selling stock or other ways. Selling new equity is not an option for small-medium companies. According to these assumptions the formula is helpful.

These assumptions can be seen as unreal. Because financial ratios may jump around from month to month. What effect will these fluctuating ratios have on SGR? According to Hewlett Packard all of these factors cannot be controlled on a day-to-day basis or even a year-to-year basis to match this formula precisely. But it does tell how fast you can grow without changing the ownership pattern, the debt structure, or any of the other basic characteristics of your business. [26]

3.1.6 The Strategic Equation

The Strategic Equation is the expansion of basic affordable growth rate.

---

[25] Charles W.Kyd, "Managing the Financial Demands of Growth", **Management Accounting**, Dec:1981 pp.31-41

[26] *How Fast isTooFast?*, http://www.exceluser.com/tools/pub_howfast.htm (20.10.2005)

g^* = Earnings retention ratio x Leverage x Profit margin x Asset turnover

g^* = (1-D) x (1+L) x P x T

$$g^* = (1-D) \times \left(1 + \frac{Debt}{Equity}\right) \times \frac{\text{Pr}\,ofit}{Sales} \times \frac{Sales}{Assets}$$

$$g^* = (1-D) \times \left(\frac{Debt + Equity}{Equity}\right) \times ROA = (1-D) \times ROE$$

$$g^* = \left(1 - \frac{Dividends\ paid}{Net\ income}\right)\left(\frac{Net\ income}{Equity}\right)$$

Dividend policy, profit margin, degree of financial leverage and asset turnover ratio determine the AGR. By the help of sensitivity analysis managers should identify a series of AGR by changing the P, D, L and T. Or managers can set certain values for D or P and establish a growth rate and the other variables need to achieve this rate.

As a tool for decision making, the equation allows a manager to test the effect on growth of proposed changes in the company's capital structure, marketing policies, dividend policy, and so on. As a means for control, it serves as a benchmark for performance and helps to communicate the reasons for that to employees. Retention ratio and leverage are decisions whereas net profit margin and asset turnover ratio is results of operating performance. D and L are the managers' behavior toward risks. P and T are the results of managers' actions.

3.1.7 Affordable Growth Rate (Price and Collins)

The sustainable growth rate is the maximum feasible growth rate of the firm when its financial parameters are held constant. Yet not all firms are operating at what may be regarded as their optimal debt/equity ratio. A related concept, the affordable growth rate of the firm is defined as the maximum feasible growth rate at a given target leverage, when all other financial parameters remain constant. In other words, the difference is that sustainable growth is determined at the existing leverage, whereas

affordable growth is determined at target leverage. Unless the firm's capital structure is at its target level, the affordable growth rate is the better indicator of the long-term sustainable growth rate. The sustainable growth rate can be converted into an affordable growth rate (AG) as follows:

AG = SG [(1 - Closing debt/Capital) / (1 – Target debt/Capital)] [27]

3.1.8 Financial Planning Equation

The Financial Planning Equation is developed to assess the impact of different degrees of financial leverage on affordable growth. The advantage of this formula related to strategic equation, is the inclusion of tax and interest expenses. The deficiency of these variables in strategic equation creates problems in both operating and financial decisions.

In the formula (1-T) shows the effective tax rate. Interest expense is before tax. EOA is earnings before interest and taxes (EBIT) divided by total assets at the beginning of the period. İ is the average before tax cost of debt.

$$g^* = (1-D)\times(1-T)\times[EOA + L\times(EOA - i)]$$

EOA shows the before interest and tax return on assets as a result of operating performance. L x (EOA – i) is the net benefit of the firm's return on equity from the use of debt. It is the proportion of debt times the spread between the cost and benefit of debt.

The financial planning equation can not be used to answer the three questions that are posed.

1 -) A company can grow faster by increasing its leverage ratio only if the contribution from debt (EOA + L (EOA – i) is expected to increase significantly. This is equivalent to saying that there must continue to be a large and positive spread between EOA and the before-tax interest rate. But there is no information about the

[27] Allan M. Price and Collins C.Maureen, "Turning Vision into Value", **Goalfix Corporation**, Johannesburg, SA, 1995, p.43

limit of that growth. Because using larger amounts of debt creates risks. Also the formula there is no information if there is an optimum debt structure.

2 -) The dangers of using large amounts of debt arise from the fact that debt magnifies the fluctuations in a firm's return on equity.

3 -) Debt structure has little bearing on the magnification effect from the use of debt. However it has other effects. If a firm wants to maintain a constant debt-to-equity ratio, it would be better to avoid intermediate term debt because such debt is usually amortized at an approximately constant rate over its life. This creates a circumstance where the leverage ratio is either continually changing or where the firm must incur the expense of continually replacing amortized debt.[28]

This formula can be modified for different debts such as (DebtA / Equity) x (EOA- Interest rate of Debt A) + (DebtB / Equity) x (EOA- Interest rate of Debt B)

If ROA is used instead of EOA, the Formula will be liked that. The Boston Consulting Group used this similar formulation with after tax variables.

Sustainable growth = [L x (ROA – interest rate after tax) x (1-D)] + ROA x (1-D)[29]

$$g^* = (1-D)\times\{ROA + Debt/Equity[ROA - i(1-t)]\}$$

The formula shows that the variables of sustainable growth rate are retention ratio, debt/equity ratio and return on asset. Interest rate and tax can not be controlled by the firm directly.

Restructuring assets/projects generally takes the form of eliminating unprofitable projects and divisions and/or acquiring new assets. The objective in asset restructuring is to increase the firm's return on assets, which in turn increase growth rate. The changing of a firm's asset mix also leads to a change in the riskiness of the firm, which causes discount rates to shift. The net effect of these changes in growth and

[28] Kyd, p.34,
[29] Colin Firer, "Driving Financial Performance Through the Du Pont Identity: A Strategic Use of Financial Analysis and Planning", **Financial Practice and Education**, Spring/Summer, 1999, p.42

risk will determine the change in firm value.[30] When the partial derivation of the formula is taken according to ROA, it will be seen that the effect of change in ROA will depend on retention ratio and debt/equity ratio. Changing the capital structure (debt/equity) means change in leverage. change in leverage will affect the interest rate so while calculating the sustainable growth rate, change in leverage and interest rate will be considered. Retention ratio is related with dividend policy. So increase in dividends will decrease retention ratio and so sustainable growth rate will decrease.

3.1.9 The DuPont Equation

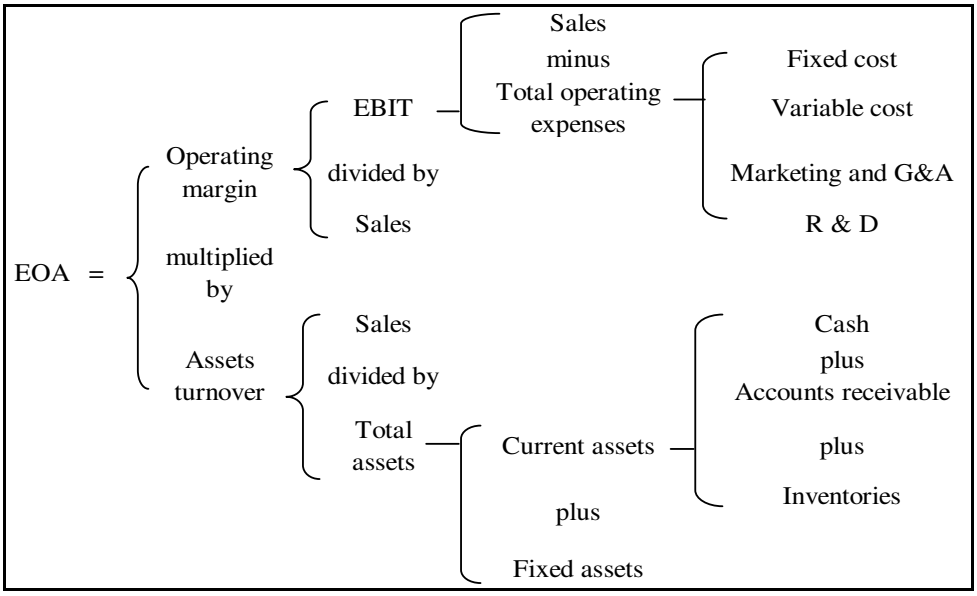

Figure 3.1. DuPont Analysis

The DuPont Model above outlines a framework for management to watch the growth and profitability objectives. The figure 3.1 can be expanded so that the performance of departments can be followed. Firms will shape its ratios for achieving their goals. DuPont equation will help the firms in evaluating the trade-offs between ratios. In the financial planning equation the operating performance of firm is shown by EOA= EBIT/Total Assets. DuPont Equation details this operating performance. The data used in the equation comes from present balance sheet not from the end of the previous period balance sheet. EOA is calculated by dividing EBIT by the beginning

[30] Damodaran, p.135

year assets but in DuPont equation EOA is modified. Because the presents year's assets is used in the formula. So the formula will be EOA[1](EBIT/Present assets)=EOA(EBIT/Beginning years' assets) / 1+g*. [31] Firms will manage its growth considering profit margin. So in order to achieve the estimated profit margin based on sustainable growth rate, managers will reshape the ratios in DuPont analysis.

To be successful, DuPont analysis must be carried to an operating level that is meaningful for managers as well as line workers. For example, inventory turnover directly affects asset turnover, which affects ROE and shareholder value. The same is true for general and administrative expenses as a percentage of sales, which in turn also affect ROE and shareholder value. At this level, plant managers, or human resources managers can see the impact of their actions on shareholder value.[32]

3.1.10 Sustainable growth and the raising of new equity

If no new equity is sold, the only growth in book value comes from retained earnings; That means new equity will be equal to equity at the beginning of the period plus profit retained after dividends. If new equity is sold, Clarke, Wilson, Daines and Nadauld show that the growth in book value per share is given by[33]:

$$BV/BV_o = (1+g_s) = (1+ SG) \times [\ 1+ (\alpha . x_. g_s)] / (1+g_s)$$

Where α = Share price/BV_0

g_s = proportional increase in the number of issued shares

= (Number of new shares issued)/(opening number of shares)

Thus if the new shares are not sold at book value, the growth in book value per share will differ from the sustainable growth rate. Therefore the magnitude of a firm's share price has an influence on its sustainable growth rate when new equity is to be sold

[31] Kyd, p.37
[32].Slater and Olson, p.49
[33] Roger G.Clarke and Others, **Strategic Financial Management**, Richard D. Irwin, Homewood, Illinois., 1988, p.227

for a given degree of dilution in issued shares, the greater the share price relative to the book value per share, the greater the firm's sustainable growth rate.

3.1.11 Sustainable Growth Rate without Dividend

Growing needs additional assets to support this growth. If growth exceeds the financial resources necessary to fund the increase in assets, problems in cash flow may result in unsustainable growth, and in some cases bankruptcy. So, sustainable growth rate is the rate that a firm can grow with controlling cash flow and capital structure.

In strategic equation, sustainable growth rate is equal to the return on equity (ROE) multiplied by one minus the dividend payout rate (1-D). When there is no dividend payout, the result is that the sustainable growth rate equals the return on equity. A simpler way to break this down into components is to estimate the ROE and SGR using measures profitability, variable assets and variable liabilities.

$$SGR = \frac{\text{net profit margin}}{\frac{\text{assets}}{\text{net sales}} - \frac{\text{variable liabilities}}{\text{net sales}} - \text{net profit margin}}$$ [34]

All profits are retained in the business. Variable assets that tend to vary with sales these might include cash, accounts receivable, inventory and prepaid expenses. If assets varies with sales can not be estimated accurately, growth target would be planned more conservative in order to avoid unexpected cash flow problems. Those liabilities which vary as sales are variable liabilities such as accounts payable and any expenses accrued but not yet paid..

If net sales are 100.000, variable assets are 45.000, variable liabilities are 20.000, profit is 2.000, sustainable growth rate is 8,7 percent based on the relationship between the level of assets required to support those sales and the cash it is able to generate internally. If the firm grows 35 percent while it is limited by financial constraints to 8,7 percent, financial problems for the firm will occur. With this wide a

[34] David Tarantino, "Nuts and Bolts of Business-Determining Sustainable Growth", **The Physician Executive**, 2004, November/December p.70

gap it is probably safe to say that, even after internal operations are turned to free up the most cash possible, some amount of new debt and/or equity will be needed of the company is to expand. Rather than simply "go for it," it suggests the need for a financial strategy to manage growth. This begins with an understanding of the interrelationships between growth, the assets needed to support it and the liabilities necessary to fund them. It means knowing that there are appropriate levels of debt in relation to a company's equity, industry norms and the cost of borrowing; that there are optimum debt to equity ratios (leverage) which will yield maximum sustainable growth; that there are optimum growth rates to target based on a company's financial constraints[35].

Also Eisemann has developed a model based on spontaneous liabilities. Eisemann revised Higgins model by allowing only spontaneous liabilities to grow at the same rate as sales without increasing other sources of debt. Eisemann's model is presented below:

$$g^* = P (i-D)/[(TA/S) - L - P (1-D)]$$[36]

where: g'* is the sustainable growth rate in sales;

p is the profit margin;

d is the dividend payout ratio;

TA/S is the ratio of total assets to sales;

L is the ratio of spontaneous liabilities to sales.

3.1.12 Sustainable Growth Rate in Financial Distress

The conventional formula for sustainable growth rate is derived intuitively by considering how a firm pays new assets when it is unable or unwilling to sell new equity and wants to maintain its capital structure. Newly acquired assets are viewed as a

[35] Bob Ebberson, "Matching Growth, Financial Resources is a Balancing Act", http://www.nhsbdc.org/Article11_Matching%20Growth%20and%20Money.htm, (01.02.2006)
[36] Peter C.Eisemann, "Another Look at Sustainable Growth," **Journal of Commercial Bank Lending**, October 1984, pp. 47-51

use of funds while retained earnings and new borrowings are the two financing sources. The amount of growth a financially distressed firm can finance is derived by eliminating the new debt component[37].

$$\Delta TA = \frac{TA_0}{S_0}\Delta S = \frac{1}{A}\Delta S = \frac{\Delta S}{A}$$

$$\Delta TA = \Delta R$$

$$\frac{\Delta S}{A} = PxRxS$$

$$\frac{\Delta S}{S} = PxRxA$$

$$g^* = PxRxA$$

Sustainable growth rate formula for firms in financial distress shows that sustainable growth rate depends on profit margin, retention ratio and asset turnover ratio. The difference from P x R x A x T is T (1+L=1+Debt/Equity), so P x R x A is smaller than P x R x A x T. Normally, growth rate of firms in financial distress will be small.

Firms in financial distress will be reluctant to pay dividends. If the firm in financial distress chooses not to pay dividend, sustainable growth rate formula will change. The sustainable growth rate formula will be P x A (profit margin * asset turnover).

3.1.13 Summary

The affordable growth rate g^* reflects the contribution of internal operations to the increase in total assets.

[37] Harlan D. Platt, Marjorie B. Platt, and Guangli Chen, "Sustainable Growth Rate of Firms in Financial Distress", **Journal of Economics and Finance**, Volume 19, Number 2, Summer 1995 pp.149-150

Implementing and calculating AGR is not so easy. Some conditions must be met in order to calculate a meaningful AGR. First of all the firm must be profitable. A negative AGR is meaningless. Also performance of the firm must follow a trend over several periods. Management can determine the growth rate that the firm can afford for current and future periods by current and future policies. It is a benchmark for managing today's performance to meet tomorrow's goals. But the success of AGR will decrease if the performance of the firm fluctuates.

The assumptions of AGR must not be destroyed. Assets and sales will growth at the same rate and ROA will remain constant. But in real life these assumptions can vary. If the variance is less, calculating an average ROA can solve the problem. If the variance is high, new ratios will be used to calculate a new g^*.

Capital transactions such as employee stock purchases through payroll deductions and preferred stock that has both stock and debt features. Also depreciation policy of the firm has important effects on EOA. A new facility will lower the accounting profits. Timing factors influence EOA. For example spending on R&D for new technology will decrease today's EOA.

3.2 Disaggregated Models

The Higgins model and Johnson model assumes that some ratios are constant during the planning period. But for many firms these ratios are not stable. Disaggregated models fix this problem and can be used while these ratios are fluctuating. Also the models described before have some assumptions that can be hard to face in real life. Assets will grow at the same rate with sales; profit margin will stay constant during planning period. In the Higgins Model, it is assumed that the firm maintains a constant financial structure whereas in the Johnson Model, it is assumed that the firm maintains a constant capital structure. Disaggregated model is more appropriate when these assumptions are not met. The sustainable corporate growth can be calculated with a targeted capital or financial structure.

3.2.1 Targeted Capital Structure

Capital structure is the ratio of long-term debts to equity (x). Assets is equal to liabilities plus shareholders' equity so;

(Cash + Inventory + Receivables + Other current assets) + (Fixed assets + other fixed assets) = Accounts payable + Notes payable + Other Liabilities + Long term debt + Equity + Profit margin x Sales (1 – dividend payout ratio)

$$(c + i + r + o_c) + (f + o_f) = (a + n + o_L) + L + [e_0 + ms_1 (1-d)]$$

If the firm wants to main a target capital structure (x) the formula will be modified as;

$$(c + i + r + o_c) + (f + o_f) = (a + n + o_L) + (e_0 + ms_1 (1-d)) (1+x)$$

$$s_1 = [(c + i + r + o_c + f + o_f - (a + n + o_L) - e_0 (1+x)] / m(1-d) (1+x)$$

$$g = (s_1 - s_0) / s_0 = (s_1 / s_0) - 1$$

$$g^* = \{[(c + r + i + o_c + f + o_f - a - n - o_L) - e_0 (1+x)] / [m(1-d) (1+x) s_0]\} - 1$$[38]

If the firm wants to main a target capital structure, balance sheet accounts and financial ratios will be shaped so. The reason of difference between actual growth rate and sustainable growth rate can be searched from the equation. The required modifications in balance sheet accounts should be done.

3.2.2 Targeted Financial Structure

Financial structure is the ratio of total debt to equity (y). From the same logic that is applied to targeted capital structure the formula should be;

$$y = (a + n + o_L + L) / (e_0 + ms_1 (1-d))$$

$$y (e_0 + ms_1 (1-d)) = (a + n + o_L + L)$$

[38] Tarık Var, "Firma Düzeyinde Sürdürülebilir Büyüme",(Yüksek Lisans Tezi, İTÜ Fen Bilimleri Enstitüsü, Haziran 1998), p.77

$$s_1 = [(c + i + r + o_c + f + o_f - e_0 (1+y)] / m(1-d) (1+y)$$

$$g^* = \{[(c + i + r + o_c + f + o_f - e_0 (1+y)] / [m(1-d) (1+y) s_0]\} - 1$$[39]

When we reshape the Higgins model according to the letters used in the formulas above;

$$g^* = [m(1-d) (1+y)] / [t-m(1-d)(1+y)]$$

But, this formula requires constant ratios for the planning period. "t" is the ratio of total assets to sales and it is assumed to be constant.

$$t = (c + i + r + o_c + f + o_f) / s_1$$

If the disaggregated model with target financial structure is modified with these assumptions, the same result for sustainable growth will be achieved. But the disaggregated models are more realistic because there are no constant assumptions.

$$g^* = [(e_0 (1+y)] / [(t-m(1-d)(1+y)] s_0 - 1$$

Formula of Disaggregated models with target financial and capital structure contains balance sheet accounts, sales and profit margin. Forecasting models such as regression model, exponential smoothing, Box-Jenkins model, and trend analysis can be used to forecast these variables. Also pro-forma statements can be prepared. But the other models assume some constant ratios that ignore flexibility. For example the asset will grow at the same rate with sales. In real life, the firm can have idle assets and these can be used when the sales increases. The disaggregated models have no such assumptions.

The firm can forecast its assets, liabilities, debt – to – equity ratios, profit margin, and dividend pay-our ratio. Then these variables can be used in the formulas and growth plans can be analyzed. Also the mutual coherence of the variables can be searched. The effect of the change of each variable on the sustainable growth ratio can be determined. The forecasted values can be inserted in the formula and the missing

[39] Var, p.78

ratio can be obtained. When the variables are forecasted accurately, trade-off between two variables can be seen clearly.

3.3 Cash Flow Models

Higgins, Johnson and Kyd models are based on accrual based accounting numbers. Accrual basis requires to recognize the revenue when earned (delivery or issuing of invoice) and the expenses when incurred. Accrual base disconnects the relation between recognition and cash flow. According to cash basis revenues should be recognized when collected in cash and expenses should be recognized when only paid in cash.[40] According to the income statement a firm can be profitable but the firm can face cash insufficiency problem. Growth calculation can be understated by charges against income that don't require cash payments. Income statement and balance sheet are prepared on accrual base so cash flow statement should be prepared to see the cash generating ability of firm. Cash flow statement will reflect the cash flows from operating activities, investment activities and financing activities separately.

Other models determine the growth rate in sales without changing the financial structure of the firm also the assumptions of these models can be difficult to implement for managers. All firms need cash to grow and finance day-to-day operations. Cash flow models focus on the growth rate that balances the cash inflow and outflow.

3.3.1 Govindarajan-Shank Model

Strategic planning models classify the companies into four categories according to their market share and market growth rate. Market growth serves as a proxy for industry attractiveness, and relative market share serves as a proxy for competitive advantage. The growth-share matrix thus maps the business unit positions within two important determinants of profitability. Firms with high market share, high market growth rate defined as "stars"; firms with low market share, high market growth rate are defined as "question marks"; firms with high market share, low market growth rate are defined as "cash cows"; firms with low market share, low market growth rate

[40] Necdet Şensoy, "International Accouting Standarts Lecture Notes", Marmara University Institute of Social Science, 2004

are defined as “dogs”. This matrix assumes that an increase in market share will result in an increase in the generation of cash. Second assumption is that a growing market requires investment in assets to increase capacity and therefore results in the consumption of cash. So the position of a business on the growth-share matrix provides an indication of its cash generation and its cash consumption[41]. Place of the firm on this matrix will determine its cash generation and consumption. Therefore, the strategic planning must include cash sufficiency issue. The efficiency of planning would increase if enough attention is given to cash issue.

A firm is defined as “cash sufficient” if the funds (or cash) available to firm for investment equal the funds it requires for investment. Several interrelated factors affect funds availability and funds requirements.

Funds availability of a firm depends on three basic factors. Internally generated funds are affected by operating efficiency and financial strategies. A company can increase its funds by managing its operations (costs, price, and volume) more efficiently. Dividend policy of the firm will determine the profits retained. Reduction in the pay-out ratio can be negative strategy for markets unless the retained earnings are used for future investments.

Increase in the degree of financial leverage can be a source of funds. The rationale for the use of debt is that it allows a corporation to lever a constant return on assets to a higher return on equity. It follows, therefore, that a firm can use financial leverage as an important weapon to counter competition. If a firm uses a debt-to-equity ratio higher than its competitors, it can accept a lower overall return on sales than its low-debt competitions and thus follow a more aggressive pricing strategy. It can cut price relative to competitions which, even though leading to lower profit margins, would not decrease the firm’s return on equity. Pricing strategy will increase the market share of the firm. But more debt result financial distress. The level of debt must be managed. Issuing new equity is a source of funds.

[41] *The BCG Growth-Share Matrix*, http://www.netmba.com/strategy/matrix/bcg/ (02.01.2006)

After the sources of funds, use of these funds must be analyzed. Cash required depends on the amount needed to maintain the current capacity and the amount needed to finance additional capacity for growth. So capital intensity of the industry has a great effect on the fund required. Use of funds can be categorized as the investment in working capital to support increase in sales, investment in fixed assets if needed for additional sales, reinvestment on current fixed assets to maintain current capacity.

Assuming that the firm does not issue new common stock; the firm can achieve financial balance when funds required for investment is equal to funds available for investment. That is internal funds and debt supports the additional sales and maintenance of capacity. The sustainable growth rate is the rate that equates funds required and funds available. If the policy variables can be determined, sustainable growth of the firm can be calculated. In the case of financial unbalance, the firm can be a cash generator or cash absorber.

Funds required to be invested = Funds available for investment[42]

$$\text{Funds required to be invested} = \left(\text{Incremantal sales} \times \text{Plant and equipment investment rate}\right) + \left(\text{Incremantal sales} \times \text{Working capital investment rate}\right) + \left(\text{Total sales} \times \text{Capacity maintenance reinvestment rate}\right)$$

$$\text{Funds Provided by operations} = \left(\frac{EBIT - Interest}{Sales}\right) \times (1 - Tax\ rate) \times (1 - Dividend\ \ payout) + Depreciation\ rate\ on\ sales$$

$$\text{Funds available for investment} = (Funds\ \ provided\ \ by\ operations\ ) \times (1 + Sales\ \ growth\ ) \times \left(1 + \frac{Debt}{Internal\ \ funds}\right)$$

The growth rate in the formulas that balance the funds required and funds available is the sustainable growth rate. Actual growth rate will be higher if the cash flow from operations is higher than the estimated cash flow; use additional debt or decrease dividend payout ratio.

[42] Vijay Govindarajan and John K.Shank, "Cash Sufficiency: The Missing Link in Strategic Planning", **Corporate Accounting**, Winter 1984, pp.23-31.

3.3.1.1. Exhibit for Govindarajan-Shank Model

1. *To support each $1 of extra sales, the extra investment in plant and equipment is $.50*
2. *To support each $1 of extra sales, the extra investment in working capital is $.15*
3. *For each $1 of sales, $.02 must be reinvested to maintain the productive capacity of the existing plant and equipment*
4. *Profit before interest and taxes is 18% of sales*
5. *Interest expense is 2% of sales*
6. *Depreciation expense is 4.4% of sales*
7. *The income tax rate is 50%*
8. *Dividend payout ratio is .40*
9. *Each $1 of retained cash from operations is supplemented with $.40 of borrowed funds*[43]

Funds provided by operations = 0.16 x (1-0.50) x (1-0.40) + 0.044 = 0.092 of sales = 9,2% of sales

Funds available for investment = 0.092 x (1 + sales growth rate) x (1 + 0.40)

Funds required to be invested = (g x 0.50) + (g x 0.15) + [(1+g) x 0.02]

0.092 x (1 + g) x (1 + 0.40) = (g x 0.50) + (g x 0.15) + [(1+g) x 0.02]

g = 20%

The key factors for the firm can be fixed, and the effect of change in other variables can be searched. Scenarios for changes in variables can be viewed. This is the

[43] Govindarajan and Shank, pp.23-31

sensitivity analysis. So that the management can determine the sensitivity of cash flow to variables.

Based on the example, earnings have the powerful effect. So effective operations management and financial management is vital for cash generation. On the other hand, fixed asset investment has the biggest effect on cash requirements. The effect of changes in variables will depend on the situation of the firm. Also generally it is hard to change one variable without affecting others. More complex sensitivity analysis will be required.

Sustainable growth model is used in strategy formulation. Firms can do this analysis at business unit level and at overall company. Some businesses in the portfolio can be cash generator some of them can be cash absorber. The overall balance is crucial for growth. This model includes all key factors that have impact on the cash-flow potential of a firm. The management can focus on the cash sufficiency. In the case of unbalance, the firm has alternative strategies that are mentioned previously.

3.3.2 Sustainable Growth Model Based on Cash Flow

The sustainable growth rate obtained from the general cash flow format will be growth rate that balance the cash flow from operating activities, cash flow from investing activities and cash flow from financing activities. But the relation of sales with the variables in cash flow statement can not be determined accurately. So simple cash flow models can be established to calculate sustainable growth rate.

Cash flow from operating activities	+	Cash flow from investing activities	+	Cash flow from financing activities	= 0

Basic sustainable growth model assumes no new equity it does assume additional debt. Another approach could be to calculate sustainable growth where no use is made of either additional debt or new equity issues. Such an approach could therefore perhaps depend on cash flow from operating activities as the only source of cash. In this regard cash from operating activities (CFO) will be defined as:

CFO = EBIT + non cash items - interest - taxation - ΔNCC:WC

EBIT = earnings before interest and taxation;

ΔNCC:WC = changes in non-cash components of working capital (i.e. stocks, debtors, creditors);

EBIT - interest - taxation = PAT (profit after taxation)

CFO = PAT + non-cash items - ΔNCC:WC [44]

3.3.2.1 Exhibit for Sustainable Growth Model Based on Cash Flow

Assume that the firm has no borrowed capital. As a result the company does not have interest payments. There will be no investing activities in 2006, and only dividends payment will be done as financing activities in 2006.

At what sales growth rate can the firm grow in 2006 so that the cash balance on 31.12.2006 will remain? The only item remaining in the cash flow statement in 2006 will be operating activities and financing activities.

CF = PAT - ΔNCC:WC – dividends = 0

Assume that in 2006 price, cost per unit, operating cost/sales will remain fixed. Stock period, debtor's period and creditor's period of 2005 will be the same in 2006. Dividend payout ratio (D) is 0,4.

[44] Willie D. Hamman, "Sustainable growth: A cash flow model - Investment Basics XXXIII", *The Investment Analysts Journal,* 2002, Number 43, Part 5, http://www.fin24.co.za/register/help/mmx_school/displayarticlewide.asp?ArticleID=276232 (09.11.2005)

Balance sheet 31.12.2005	
Stock	1350
Debtors	1200
Cash	50
	2600
Share capital	1000
Retained income	1150
Creditors	450
	2600

Income statement 31.12.2005	
Sales (1800 units)	7200
Cost of sales	5400
Gross income	1800
Operating expenses	1050
Net income before taxation	750
Taxation (40%)	300
Net income after taxation	450

Profit in 1997 will be $Sales_{96}(1 + g)$ x Profit margin. Profit margin (6,25%) and tax rate will remain constant. So profit for 2006 will 450 x (1+g)

S	Stock period	stock/average monthly sales
		1350/600 = 2,25 months
D	Debtors' period	debtors/average monthly sales
		1200/600 = 2 months
C	Creditors' period	creditors/average monthly sales
		450/600 = 0,75 months
Working capital cycle (WCC)		S + D – C
		2,25 + 2 - 0,75
		3,5 months

$$\Delta\text{NCC:WC} = \frac{Sales_{97}(S_{97} + D_{97} - C_{97})}{12} - \frac{Sales_{96}(S_{96} + D_{96} - C_{96})}{12}$$

$$\Delta\text{NCC:WC} = \frac{Sales_{96}(1+g)(S_{97} + D_{97} - C_{97})}{12} - \frac{Sales_{96}(S_{96} + D_{96} - C_{96})}{12}$$

$$\Delta\text{NCC:WC} = \left[Sales_{96}(1+g) - Sales_{96}\right]\left[\frac{(S_{96} + D_{96} - C_{96})}{12}\right]$$

$$450(1+g) - \left(7200\ x\ g\ x\ \frac{3,5}{12}\right) - 450(1+g)\ 0,4 = 0$$

$$450(1+g)-450(1+g)0{,}4=\left(7200\ x\ g\ x\ \frac{3{,}5}{12}\right)$$

$$450(1+g)0{,}6=\left(7200\ x\ g\ x\ \frac{3{,}5}{12}\right)$$

$$270(1+g)=2100g$$
$$g=14{,}75\%$$

The above equation indicates that if CFO = Net profit - ΔNCC:WC then the growth rate in sales will affect both the left hand side of the equation and the right hand side of the equation. The longer the WCC, the lower the g for a given PAT and given sales. On the other hand, growth will be higher for a lower WCC. It is obvious that g will be higher for a high PAT (high margin).

The model also works when investing activities (new fixed assets and/or investments) will be introduced. However, the model must be adjusted when use is made of new borrowed capital to the extent that interest on the new borrowed capital will affect CFO. In such a case the cash flow model will accommodate the BCG and like models as a special case.

4. OPTIMAL SUSTAINABLE GROWTH RATE

The main objective of the firm is maximizing the wealth of shareholders not maximizing growth. The wealth of corporate owners is measured by the price of the shares. Each financial decision has an effect on the price of shares. So managers should choose the capital structure that will maximize the firm value. Maximum growth sometimes cannot match the objective of maximizing the wealth of shareholders. Financial structure of the firm will be shaped to minimize the cost of capital in order to achieve optimal capital structure. Changes in capital structure benefit the stockholders if and only if the value of the firm increases.

"What is the cost of capital to a firm in a world in which funds are used to acquire assets whose yields are uncertain; in which capital can be obtained by many different media, ranging from pure debt instruments, representing money-fixed claims, to pure equity issues, giving holders only right to a pro-rata share in the uncertain venture? Modigliani and Miller (MM) argue that the average cost of capital to any firm is completely independent of its capital structure and is equal to the capitalization rate of pure equity stream of its class."[45] Value of the firm is always the same under different capital structures. In still other words no capital structure is any better or worse than any other capital structure for the firm's stockholders. The assumption "homemade leverage" of MM is true only individuals can borrow on the same terms as the firms. Modigliani and Miller proposition II (no taxes) says that expected return on equity is positively related to leverage because as the leverage increase risk to shareholders increase. When the firm adds more debt, the remaining equity becomes more risky. As the risk rises, the cost of equity capital rises as a result. The increase in the cost of the remaining equity capital offsets the higher proportion of the firm financed by low-cost debt. In fact, MM prove that the two effects exactly offset each other, so that the value

[45] Franco Modigliani and Merton H.Miller , "The Cost of Capital, Corporation Finance and the Theory of Investment", **The American Economic Review**, Vol. 48, No.3, Jun., 1958, pp.261-297

of the firm and the firm's overall cost of capital are invariant to leverage.[46] The assumptions of MM are unrealistic but the contribution of the theory is important for finance. Modigliani and Miller have revised their views in time. Some authors such as Baumol and Malkiel (1967), Rubinstein (1973), Stiglitz (1972), Baxter (1967), Bierman and Thomas (1972) has criticized MM theory and stated their thoughts.

Today, managers try to make an optimal mix of debt and equity that will minimize the cost of capital. The sustainable growth rate that is calculated based on the optimal capital structure is the optimal sustainable growth rate. So that the growth rate must maintain the minimum cost of capital and so wealth of shareholders will be maximized.

4.1 Weighted Average Cost of Capital

The items on the right side of a firm's balance sheet are its capital components. Any increase in assets must be financed by an increase in one or more of these capital components. Capital is a necessary factor of production, and like any other factor, it has a cost. The cost of each component is called the components cost of particular type of capital.[47] Calculation of the cost of components is not the subject of this study.

Firms try to establish an optimal capital structure that causes its stock price to be maximized. When this target (optimal) capital structure is established, increase in capital components will be made in a manner that will protect the optimal structure. The target proportions of debt, preferred stock and common equity along with the component costs of capital are used to calculate the firm's weighted average cost of capital. Proportion of each component is multiplied by the cost of this component's cost and these values are added to reach weighted average cost of capital.

The graph of weighted average cost of capital is U-shaped. Firstly weighted average cost of capital will decrease by the use of more debt and equity then reach minimum. But after that point, change in the proportions of debt-equity will increase the

[46] Stephen A.Ross, Randolph W.Westerfield and Jeffrey Jaffe, **Corporate Finance,** 6th edition, McGraw-Hill, 2002, pp.395-405
[47] Richard A.Brealey and Stewart C.Myres, **Principles of Corporate Finance,** New York, McGraw-Hill, 1996, p.422

weighted average cost of capital. Firms try to establish a capital structure at this minimum point.

4.2 Optimal Sustainable Growth Rate and Optimal Capital Structure

Higgins basic sustainable growth rate formula $\mathbf{g}^* = \frac{\Delta S}{S_0} = \frac{(1-D)\ x\ P\ x\ (1+L)}{[T-(1-D)\ x\ P\ x\ (1+L)]}$ focuses only on sources and use of fund. Cost of these funds is not taken into consideration. Costs of these funds are crucial while constructing capital structure.

4.3 Exhibit for Optimal Sustainable Growth

Firm XYZ has a financial structure of $200.000 composed of only common share (equity). Net sales of the firm are $80.000, total assets/net sales ratio is 2,5, tax rate is 0,4. Other variables for the firm are given in the table 1 below. In first scenario, the firm's capital is only composing of equity. When the firm starts to use debt, each additional debt increases after tax cost of debt. Rise of additional financial risk is the reason of rise in cost of debt. Increase in debt/equity ratio results increase in cost of equity. Weighted average cost of capital shows U shape curve by decreasing to minimum and then increasing. Profit will decrease because of the interest payments occurring from the use of additional debt. Firm will try to establish an optimal capital structure that will minimize the cost of capital.

The fifth scenario gives the minimum cost of capital; the firm has 60% equity and 40% debt. Optimal sustainable growth rate is calculated according to the minimum cost of capital. When the cost of capital is 9%, optimal sustainable growth rate is 11,212% (Higgins formula) and 10,081% (affordable growth rate). If these ratios are kept, optimal capital structure will maintain.

Table 4.1
Variables for Firm XYZ

Equity $	Debt $	Equity %	Debt %	Cost of Debt (1-T) %	Cost of Equity %	WACC %	(debt / equity)	Net profit $	Net Sales $
200.000	0	100	0	0	10	10	0	20.000	80.000
180.000	20.000	90	10	4	10,2	9,58	0,11	19.000	80.000
160.000	40.000	80	20	5	10,4	9,32	0,25	18.000	80.000
140.000	60.000	70	30	5	10,8	9,06	0,43	17.000	80.000
120.000	**80.000**	**60**	**40**	**6**	**11**	**9**	**0,67**	**16.000**	80.000
100.000	100.000	50	50	9	11,5	10,25	1	13.500	80.000
80.000	120.000	40	60	9,5	12	10,5	1,5	11.000	80.000
60.000	140.000	30	70	10	12,5	10,75	2,33	8.800	80.000
40.000	160.000	20	80	11	15	11,8	4	7.200	80.000
20.000	180.000	10	90	12	20	12,8	9	5.100	80.000

Table 4.2
Optimal Sustainable Growth Calculations for XYZ

Profit margin (P)	ROE	Dividend	Dividend payout ratio	R = 1-D	T = total assets/net sales	(1-D) ROE	Value of firm
0,25	0,1	3.000	0,15	0,7	2,5	7,00%	200.000
0,24	0,11	2.700	0,14	0,72	2,5	7,59%	206.275
0,23	0,11	2.500	0,14	0,73	2,5	8,19%	213.077
0,21	0,12	2.200	0,13	0,75	2,5	9,11%	217.407
0,2	**0,13**	**2.000**	**0,13**	**0,76**	**2,5**	**10,08%**	**225.455**
0,17	0,14	1.700	0,13	0,77	2,5	10,44%	217.391
0,14	0,14	1.400	0,13	0,78	2,5	10,74%	211.667
0,11	0,15	1.000	0,11	0,8	2,5	11,79%	210.400
0,09	0,18	750	0,1	0,81	2,5	14,63%	208.000
0,06	0,26	500	0,1	0,82	2,5	20,95%	205.500

5. APPLICATION OF SUSTAINABLE GROWTH MODEL TO FIRMS IN ISTANBUL STOCK EXCHANGE

In this part, the relation of actual growth, sustainable growth and return of share will be searched. This search will enclose the firms that are suitable for the sustainable growth model assumptions and trading in Istanbul Stock Exchange (ISE).

Firstly, nominal growth rate and sustainable growth rate will be compared, then the relation of this comparison with the return of share will be discussed. To determine the strength, direction and significance of this relation, correlations will be calculated by SPSS. After that nominal growth rate will be deflated to real growth rate. So real growth rate and sustainable growth rate can be compared. The correlation calculation will be repeated for real growth rate, sustainable growth rate and return of share.

Sustainable growth model has some assumptions like any other models and the assumptions of models generally are different from real life situations. Also growth in corporation is affected by many internal and external factors such as managerial performance, success of departments and workers, organization structure, size and structure of market rivals, macroeconomics variables.

5.1 Methodology of the Application

The basic sustainable growth rate formula (R x ROE) will be used because this formula is the basic of the other sustainable growth theories and it is easy to understand and calculate.

The firms which make steady dividend payments for the periods between 1992-2003 are chosen from Istanbul Stock Exchange. The name and code of these firms are given in table 5.1. The net profit, dividends paid, net sales and equity of these firms between the years 1992-2003 are obtained from Istanbul Stock Exchange and given in

the tables Appendix 1. Dividend payout ratio, retention ratio and return on equity are calculated to obtain sustainable growth rate. Data for 2004 is not used because inflation accounting is applied on 2004 so that historical cost data and inflation accounting data are separated.

Sustainable growth rate, nominal growth rate, the difference between nominal growth rate and sustainable growth rate, return on share and relative return on share is given in Appendix 2. The effect of inflation is eliminated and sustainable growth rate, adjusted (real) growth rate, the difference between real growth rate and sustainable growth rate, return on share and relative return on share is given in Appendix 3. Relative return of a share is the return of this share according to the return of Istanbul Stock Exchange Index.

Table 5.1

Selected Firms from ISE for The Application

STOCK CODE in ISE (İMKB)	NAME of THE SELECTED COMPANY
MRDIN	MARDİN ÇİMENTO
GOLTS	GOLTAS ÇİMENTO
CIMSA	CIMSA ÇİMENTO
OYSAC	OYSA ÇİMENTO
MRSHL	MARSHALL BOYA
KORDS	KORDSA SABANCI DUPONT
KARTN	KARTONSAN
BTCIM	BATI ÇİMENTO
BRISA	BRİSA
BOSSA	BOSSA
BAGFS	BAGFAŞ
PNSUT	PINAR SÜT

5.2 Nominal – Real Growth

To eliminate the effect of inflation on sales growth, indexes are used. So nominal sales are deflated by the index numbers to achieve real sales numbers. By using

the real sales, actual real growth rates are achieved. This real growth rates are given in Appendix 3.

At this point, it is assumed that sustainable growth rate R x ROE is not affected by the inflation. Because retention ratio "R" is not affected by the inflation and the effect of inflation on return on equity "ROE" is ignored. There are three types of price indexes: 1968 = 100, 1985 = 100 and 1994 = 100. The calculation of the index "1968=100" is different from the today's index calculations and the index "1994=100" is not covering the years used in the application, so the most suitable index "1985 = 100" is chosen.

Table 5.2

Cost of Living Index for Wage Earners (1985=100)

Average	General Index
2003	964.550,20
2002	768.888,57
2001	533.693,47
2000	352.568,60
1999	231.436,46
1998	145.427,73
1997	79.013,72
1996	41.322,52
1995	21.181,71
1994	10.817,89
1993	5.244,12
1992	3.094,26
1985	100,00

5.3 Sustainable Growth Rate – Actual Growth Rate

When the data in table Appendix 2 are analyzed, it is found that sustainable growth rate and nominal growth rate of the firms are fairly different. The reason for this difference is the mismatch of the assumptions of the model with real life situations and high inflation rates in Turkey.

If the real growth rate is compared instead of nominal growth rate with sustainable growth rate, the difference decreases dramatically. Table 5.3 shows that average difference between nominal growth rates - sustainable growth rate and the average difference between real growth rates – sustainable growth rate. For each firm used in this analysis, the difference decreases with real growth rates.

Table 5.3

Average Difference Between Sustainable Growth Rate and Actual Growth Rate

Stock Code	Firm	Average Difference Between SGR-NGR	Average Difference Between SGR-RGR
MRDIN	MARDİN ÇİMENTO	-64,043%	5,952%
GOLTS	GOLTAS ÇİMENTO	-46,779%	18,212%
CIMSA	CIMSA ÇİMENTO	-65,211%	7,082%
OYSAC	OYSA ÇİMENTO	-73,005%	-1,411%
MRSHL	MARSHALL BOYA	-51,014%	15,041%
KORDS	KORDSA SABANCI DUPONT	-62,960%	7,830%
KARTN	KARTONSAN	-57,190%	13,044%
BTCIM	BATI ÇİMENTO	-46,659%	17,941%
BRISA	BRİSA	-58,429%	11,468%
BOSSA	BOSSA	-40,000%	18,381%
BAGFS	BAGFAŞ	-50,545%	17,004%
PNSUT	PINAR SÜT	-68,133%	4,550%

5.4 The Relation of Relative Return and The Difference Between Sustainable Growth Rate and Actual Growth Rate

The data for relative return, the difference between sustainable growth rate – nominal growth rate and the difference between sustainable growth rate – real growth rate can been seen in Appendix 2 and 3. Correlation coefficients (typically denoted by the statistic "r") describe the strength and direction of the relationship between two variables. Correlations range from -1.0 to +1.0 in value. In this application, the relation between variables is assumed to be negative because as the difference between

sustainable growth rate and actual growth rate gets bigger, financial position of the firm will be worse off so that the relative return will decrease.

The correlation of relative return and the difference between SGR – NGR for the chosen 12 firms is insignificant. Also the negative relation can be seen, the Sig. (2-tailed) for all firms is above the required number of 0,05. So the negative relation is meaningless.

The correlation of relative return and the difference between SGR – RGR is more significant. Especially, Batı Çimento with 0,082, Brissa with 0,119, Goltas Çimento with 0,089 and Bossa with 0,06 significance level shows the negative correlation between relative return and the difference.

This application shows that the sustainable growth model is not appropriate for the firms in Istanbul Stock Exchange. Only 12 firms are suitable for the model, and only 4 of them shows the expected results according to model.

Table 5.4

Correlation of SGR – AGR with Relative Return

		Correlation of SGR-NGR with relative return		Correlation of SGR-RGR with relative return	
Name of the firm	**N**	**Pearson Correlation**	**Sig. (2-tailed)**	**Pearson Correlation**	**Sig. (2-tailed)**
MARDİN ÇİMENTO	11	-0,003	0,993	-0,092	0,788
GOLTAS CİMENTO	9	-0,568	0,111	-0,597	0,089
CIMSA CIMENTO	11	0,175	0,608	-0,203	0,55
OYSA CİMENTO	11	-0,151	0,658	-0,141	0,678
MARSHALL BOYA	11	-0,33	0,322	-0,266	0,429
KORDSA S.DUPONT	11	-0,258	0,445	0,111	0,745
KARTANSON	11	-0,26	0,44	-0,247	0,464
BATI CIMENTO	9	-0,419	0,262	-0,609	0,082
BRISA	11	-0,577	0,063	-0,497	0,119
BOSSA	8	-0,64	0,088	-0,862	0,06
BAGFAS	11	-0,457	0,157	-0,329	0,323
PINAR SUT	11	-0,001	0,998	-0,124	0,716

6. CONCLUSION

It may come as a surprise to some that excessive growth in sales can sometimes be more threatening to the survival of the firm than no growth. This leads us to the question, "Is there a rate of corporate growth that is both desirable and sustainable?" This thesis discuss this subject by presenting the analytical models and tools that enable corporate planners to evaluate their own growth needs, target realistic expectations, and assess the collateral risks of growing either too rapidly or too slowly. The analytical models used in the calculation of sustainable growth rate are firm aggregate models, firm disaggregated models and cash flow models. All models have some assumptions that can be hard to face in real life so differences between actual growth rate and sustainable growth rate occur. Appropriate corrective actions that can be taken when optimal or feasible growth rates are not achieved, are given.

It is shown that the thought “bigger is better,” is not appropriate for each firm. Growth rate that has an positive effect on value is good for the firm. Value-based management focuses on the actions that increase the value of the firm. So firms can need to stop growth in some situations. Growth plans of management will be value-based. Unmanaged or mismanaged growth leads to decrease in value of the firm, unfulfilled projects that produce no revenue, customer dissatisfaction, and expenses that exceed cash flows or available financing, which, in turn, creates possibly fatal liquidity problems. So managers must free up the necessary resources to finance growth, which requires a long-range plan that is in keeping with the long-term prospects of the business and its industry.

The application part argues that if the firms in Istanbul Stock Exchange have an actual growth rate around the sustainable growth rate. The basic sustainable growth rate model is chosen for the calculation of sustainable growth rate of firms in the application. The results shows that there are differences with actual growth rates and

sustainable growth rates because of the high inflation in Turkey, mismatch of assumptions with real life situations and market inefficiency of Istanbul Stock Exchange. The correlation calculations shows that the relation between the return on share and the difference of actual growth rate and sustainable growth rate is meaningless. The lack of implementation of inflation accounting for many years and the unstable dividend payments of firms in İstanbul Stock Exchange restrict the content of the application. Further studies with different sustainable growth models can be done in İstanbul Stock Exchange or in foreign stock exchange markets.

As stated above, growth of a firm depends on many variables. But this study focuses on the financial resources that a firm has in order to finance its growth. Management needs to control the financial resources and the growth of firm to maximize the value of the firm.

1. SGR CALCULATION FOR THE FIRMS IN APPLICATION

MRDIN - MARDİN ÇİMENTO (YTL)								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	12.919.093	0	60.682.343	58.948.028	0,00	1,00	0,219	0,219
2002	14.348.559	11.960.667	41.313.227	45.550.356	0,83	0,17	0,315	0,052
2001	18.880.699	15.752.390	37.007.005	39.621.089	0,83	0,17	0,477	0,079
2000	9.571.365	7.859.092	25.493.544	23.413.052	0,82	0,18	0,409	0,073
1999	6.625.848	5.439.798	14.808.093	16.116.734	0,82	0,18	0,411	0,074
1998	2.898.234	2.253.333	8.592.214	7.408.461	0,78	0,22	0,391	0,087
1997	1.329.403	1.142.304	4.297.779	3.716.523	0,86	0,14	0,358	0,050
1996	385.145	329.900	1.950.552	1.558.638	0,86	0,14	0,247	0,035
1995	413.523	359.712	1.054.425	1.035.650	0,87	0,13	0,399	0,052
1994	301.560	253.015	623.002	565.600	0,84	0,16	0,533	0,086
1993	145.919	131.019	344.334	252.114	0,90	0,10	0,579	0,059
1992	86.119	75.584	199.014	142.815	0,88	0,12	0,603	0,074

GOLTS - GOLTAŞ ÇİMENTO (YTL)								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	9.696.161	6.000.000	73.024.241	64.594.727	0,62	0,38	0,150	0,057
2002	14.075.906	5.995.121	70.567.766	50.693.331	0,43	0,57	0,278	0,159
2001	1.609.160	1.260.000	45.109.554	30.636.495	0,78	0,22	0,053	0,011
2000	3.454.349	1.800.000	25.814.262	26.376.503	0,52	0,48	0,131	0,063
1999	3.614.948	2.016.000	18.309.709	18.214.975	0,56	0,44	0,198	0,088
1998	3.226.589	1.476.000	15.033.653	13.325.259	0,46	0,54	0,242	0,131
1997	3.024.583	1.200.000	9.377.521	8.443.413	0,40	0,60	0,358	0,216
1996	1.066.945	508.200	4.630.957	2.576.418	0,48	0,52	0,414	0,217
1995	516.963	254.100	2.338.096	1.416.589	0,49	0,51	0,365	0,186
1994	302.413	123.480	1.182.692	641.804	0,41	0,59	0,471	0,279

CIMSA - ÇİMSA ÇİMENTO (YTL)								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	68.650.843	25.474.176	275.722.664	431.266.244	0,37	0,63	0,159	0,100
2002	37.847.848	32.954.264	197.797.580	184.523.332	0,87	0,13	0,205	0,027
2001	28.483.457	21.561.909	141.592.351	123.416.827	0,76	0,24	0,231	0,056
2000	13.421.232	6.570.720	75.379.944	72.710.861	0,49	0,51	0,185	0,094
1999	10.788.069	5.222.880	48.756.566	43.150.009	0,48	0,52	0,250	0,129
1998	6.729.433	4.212.000	31.385.646	27.547.565	0,63	0,37	0,244	0,091
1997	3.393.778	1.600.560	18.676.424	13.907.036	0,47	0,53	0,244	0,129
1996	1.138.237	547.560	9.174.549	5.442.599	0,48	0,52	0,209	0,109
1995	670.379	322.920	4.267.814	2.527.247	0,48	0,52	0,265	0,137
1994	614.748	415.584	2.413.194	1.581.230	0,68	0,32	0,389	0,126
1993	245.957	123.552	1.164.343	721.798	0,50	0,50	0,341	0,170
1992	101.528	48.017	614.622	413.611	0,47	0,53	0,245	0,129

OYSAC - OYSA ÇİMENTO (YTL)								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	11.483.750	0	67.220.726	48.920.052	0	1	0,235	0,235
2002	8.196.804	7.459.107	31.178.950	16.177.175	0,91	0,09	0,507	0,046
2001	4.934.607	4.494.000	19.932.629	10.805.324	0,91	0,09	0,457	0,041
2000	2.791.738	2.482.202	14.356.176	7.211.609	0,89	0,11	0,387	0,043
1999	2.809.879	2.434.668	9.483.565	5.773.191	0,87	0,13	0,487	0,065
1998	2.099.814	1.851.500	7.211.980	4.003.417	0,88	0,12	0,525	0,062
1997	650.867	596.645	3.986.140	1.762.178	0,92	0,08	0,369	0,031
1996	411.799	382.108	2.025.980	1.144.293	0,93	0,07	0,36	0,026
1995	123.082	114.682	1.034.092	489.234	0,93	0,07	0,252	0,017
1994	146.753	134.484	588.367	287.985	0,92	0,08	0,51	0,043
1993	70.386	63.671	270.704	127.763	0,9	0,1	0,551	0,053
1992	18.605	16.575	142.287	39.784	0,89	0,11	0,468	0,051

MRSHL - MARSHALL BOYA (YTL)								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	3.848.715	1.731.840	117.282.003	76.526.302	0,45	0,55	0,050	0,028
2002	5.021.419	2.043.571	116.412.309	51.529.583	0,41	0,59	0,097	0,058
2001	1.808.859	1.626.463	77.641.639	35.385.588	0,90	0,10	0,051	0,005
2000	8.408.188	3.879.115	63.635.473	28.890.141	0,46	0,54	0,291	0,157
1999	4.507.122	3.126.488	43.175.869	17.897.260	0,69	0,31	0,252	0,077
1998	1.083.897	454.608	30.170.195	10.295.932	0,42	0,58	0,105	0,061
1997	2.067.426	1.630.816	22.686.143	7.380.004	0,79	0,21	0,280	0,059
1996	1.103.582	627.792	10.921.360	3.591.920	0,57	0,43	0,307	0,132
1995	328.128	216.480	5.958.728	1.857.820	0,66	0,34	0,177	0,060
1994	275.494	192.780	3.078.183	944.553	0,70	0,30	0,292	0,088
1993	95.732	67.320	1.538.701	359.209	0,70	0,30	0,267	0,079
1992	53.315	37.332	925.765	194.202	0,70	0,30	0,275	0,082

KORDS - KORDSA SABANCI DUPONT (YTL)								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	25.638.735	0	340.745.200	274.992.240	0,00	1,00	0,093	0,093
2002	27.598.227	22.250.585	263.346.732	156.316.564	0,81	0,19	0,177	0,034
2001	16.393.540	13.005.166	216.936.163	97.424.813	0,79	0,21	0,168	0,035
2000	9.202.454	7.393.677	97.507.902	61.073.291	0,80	0,20	0,151	0,030
1999	3.202.840	3.933.661	61.808.000	47.583.997	1,23	-0,23	0,067	-0,015
1998	3.360.749	2.126.250	38.273.786	20.646.379	0,63	0,37	0,163	0,060
1997	4.690.334	2.232.563	25.729.316	11.907.125	0,48	0,52	0,394	0,206
1996	2.888.202	1.701.000	15.747.944	6.001.404	0,59	0,41	0,481	0,198
1995	1.259.441	595.350	7.835.577	3.145.276	0,47	0,53	0,400	0,211
1994	436.633	212.625	3.500.162	1.412.369	0,49	0,51	0,309	0,159
1993	69.889	32.653	1.711.769	648.797	0,47	0,53	0,108	0,057
1992	59.393	30.375	1.049.428	409.650	0,51	0,49	0,145	0,071

KARTN - KARTONSAN (YTL)								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	10.601.877	2.126.248	115.509.528	114.220.247	0,20	0,80	0,093	0,074
2002	20.837.258	10.428.740	110.204.437	97.694.578	0,50	0,50	0,213	0,107
2001	15.297.260	3.059.449	68.461.689	62.641.824	0,20	0,80	0,244	0,195
2000	5.848.016	3.138.747	49.345.782	39.227.795	0,54	0,46	0,149	0,069
1999	1.868.731	1.214.999	27.856.091	25.076.038	0,65	0,35	0,075	0,026
1998	4.673.321	2.632.500	15.662.265	19.723.653	0,56	0,44	0,237	0,103
1997	4.004.058	2.632.500	11.867.699	12.635.498	0,66	0,34	0,317	0,109
1996	2.739.522	1.944.000	5.709.489	7.686.548	0,71	0,29	0,356	0,103
1995	2.030.810	702.000	5.086.185	4.638.716	0,35	0,65	0,438	0,286
1994	673.242	324.000	2.167.267	1.890.875	0,48	0,52	0,356	0,185
1993	186.437	67.500	842.001	802.569	0,36	0,64	0,232	0,148
1992	48.428	32.400	519.510	459.614	0,67	0,33	0,105	0,035

BTCIM - BATI ÇİMENTO								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	8.579.007	7.242.480	163.634.945	101.902.317	0,84	0,16	0,084	0,013
2002	14.976.784	5.758.480	147.105.136	84.149.084	0,38	0,62	0,178	0,110
2001	12.309.590	5.029.421	109.969.686	54.833.489	0,41	0,59	0,224	0,133
2000	2.919.431	1.486.256	67.883.801	38.043.825	0,51	0,49	0,077	0,038
1999	2.090.555	1.313.424	42.524.287	22.433.862	0,63	0,37	0,093	0,035
1998	3.146.073	600.000	31.525.527	18.242.986	0,19	0,81	0,172	0,140
1997	5.747.844	1.800.000	19.414.582	12.775.134	0,31	0,69	0,450	0,309
1996	2.210.818	1.116.000	9.274.484	7.318.519	0,50	0,50	0,302	0,150
1995	935.064	471.500	4.722.332	2.686.451	0,50	0,50	0,348	0,173
1994	502.288	248.640	2.618.857	1.180.462	0,50	0,50	0,426	0,215

BRISA – BRİSA								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	55.690.621	0	456.755.967	316.327.068	0,00	1,00	0,176	0,176
2002	47.905.317	39.283.375	350.698.206	196.194.501	0,82	0,18	0,244	0,044
2001	25.934.319	20.594.431	202.288.011	131.591.961	0,79	0,21	0,197	0,041
2000	17.943.310	14.679.098	149.842.038	94.625.979	0,82	0,18	0,190	0,034
1999	13.137.330	6.668.789	90.555.580	64.445.491	0,51	0,49	0,204	0,100
1998	11.896.569	5.804.663	71.562.339	44.444.714	0,49	0,51	0,268	0,137
1997	11.910.227	5.581.406	46.065.876	29.567.151	0,47	0,53	0,403	0,214
1996	6.829.680	3.423.262	24.571.051	16.217.696	0,50	0,50	0,421	0,210
1995	2.469.222	1.169.438	12.782.931	7.761.501	0,47	0,53	0,318	0,167
1994	750.626	350.831	5.443.179	3.506.661	0,47	0,53	0,214	0,114
1993	197.251	94.163	2.677.002	1.255.086	0,48	0,52	0,157	0,082
1992	104.490	49.359	1.663.017	718.436	0,47	0,53	0,145	0,077

BOSSA -BOSSA (YTL)								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	3.847.687	0	250.053.094	224.667.425	0,00	1,00	0,017	0,017
2002	33.781.156	9.000.000	258.789.938	119.015.665	0,27	0,73	0,284	0,208
2001	18.304.084	12.617.789	182.814.884	76.297.091	0,69	0,31	0,240	0,075
2000	4.371.551	2.160.000	86.231.020	48.627.509	0,49	0,51	0,090	0,045
1999	6.234.263	2.825.867	60.573.814	38.158.414	0,45	0,55	0,163	0,089
1998	3.387.303	2.610.000	48.809.701	27.941.383	0,77	0,23	0,121	0,028
1997	1.826.533	765.000	36.503.449	15.328.618	0,42	0,58	0,119	0,069
1996	2.383.626	486.000	20.209.216	8.290.815	0,20	0,80	0,288	0,229
1995	1.377.204	450.000	10.951.749	4.380.837	0,33	0,67	0,314	0,212

BAGFS - BAGFAŞ (YTL)								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	33.329	0	148.608.387	55.987.696	0,00	1,00	0,001	0,001
2002	8.179.787	3.236.000	140.431.419	49.431.688	0,40	0,60	0,165	0,100
2001	7.121.510	2.116.402	123.413.331	33.558.376	0,30	0,70	0,212	0,149
2000	2.777.653	1.481.478	66.703.464	21.712.536	0,53	0,47	0,128	0,060
1999	2.599.697	1.042.684	40.062.159	14.884.033	0,40	0,60	0,175	0,105
1998	2.879.994	1.000.000	28.743.996	10.650.970	0,35	0,65	0,270	0,177
1997	2.694.148	1.200.000	21.940.300	6.656.464	0,45	0,55	0,405	0,224
1996	667.192	340.000	9.481.568	2.509.843	0,51	0,49	0,266	0,130
1995	300.947	200.000	5.793.297	1.523.083	0,66	0,34	0,198	0,066
1994	445.728	240.000	2.940.377	1.095.046	0,54	0,46	0,407	0,188
1993	192.442	120.000	1.624.161	604.704	0,62	0,38	0,318	0,120
1992	103.047	60.000	884.174	411.197	0,58	0,42	0,251	0,105

PNSUT - PINAR SÜT (YTL)								
Years	**Net Profit**	**Dividends Paid**	**Net Sales**	**Equity**	**Dividend payout ratio (D)**	**R=(1-D)**	**Return on Equity (ROE)**	**(1-D) ROE**
2003	3.005.711	2.247.553	252.767.309	273.206.165	0,75	0,25	0,011	0,003
2002	3.154.503	0	190.364.297	47.436.391	0,00	1,00	0,066	0,066
2001	2.788.486	2.478.695	154.262.299	32.399.736	0,89	0,11	0,086	0,010
2000	4.092.558	4.362.967	117.014.593	23.028.941	1,07	-0,07	0,178	-0,012
1999	3.261.698	2.583.394	72.447.259	14.898.592	0,79	0,21	0,219	0,046
1998	1.830.533	885.735	45.300.727	8.917.714	0,48	0,52	0,205	0,106
1997	1.036.843	590.490	24.483.963	4.255.017	0,57	0,43	0,244	0,105
1996	668.452	551.124	11.248.964	2.246.243	0,82	0,18	0,298	0,052
1995	105.016	87.480	5.494.631	621.339	0,83	0,17	0,169	0,028
1994	9.367	7.290	2.499.056	225.131	0,78	0,22	0,042	0,009
1993	68.734	33.048	1.171.741	140.966	0,48	0,52	0,488	0,253
1992	8.895	6.561	690.226	59.070	0,74	0,26	0,151	0,040

2. SGR – NGR - RELATIVE RETURN FOR THE FIRMS IN APPLICATION

MRDIN - MARDİN ÇİMENTO						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	60.682.343	5,242%	46,884%	-41,641%	66,86	3,4
2002	41.313.227	7,896%	11,636%	-3,741%	28,23	50,14
2001	37.007.005	7,313%	45,162%	-37,849%	129,29	40,44
2000	25.493.544	7,359%	72,160%	-64,800%	-20,95	28,52
1999	14.808.093	8,705%	72,343%	-63,638%	382,12	-1,37
1998	8.592.214	5,034%	99,922%	-94,888%	71,91	150,98
1997	4.297.779	3,544%	120,337%	-116,792%	162,8	5,81
1996	1.950.552	5,196%	84,987%	-79,791%	11,35	-52,26
1995	1.054.425	8,583%	69,249%	-60,666%	59,55	-3,6
1994	623.002	5,910%	80,930%	-75,020%	38,57	6,35
1993	344.334	7,377%	73,020%	-65,643%	228,57	-26,09
1992	199.014					

GOLTS - GOLTAŞ ÇİMENTO						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	73.024.241	15,941%	3,481%	12,460%	26,54	-21,59
2002	70.567.766	1,140%	56,436%	-55,297%	15,37	35,08
2001	45.109.554	6,272%	74,747%	-68,475%	106,32	26,38
2000	25.814.262	8,778%	40,987%	-32,209%	-64,9	-42,93
1999	18.309.709	13,137%	21,791%	-8,654%	259,61	-26,43
1998	15.033.653	21,610%	60,316%	-38,706%	-35,15	-5,32
1997	9.377.521	21,687%	102,496%	-80,810%	301,85	61,8
1996	4.630.957	18,556%	98,065%	-79,509%	119,96	-5,69
1995	2.338.096	27,880%	97,693%	-69,813%	21,1	-26,83
1994	1.182.692					

CIMSA - ÇİMSA ÇİMENTO						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	275.722.664	2,652%	39,396%	-36,744%	78,2	1,41
2002	197.797.580	5,608%	39,695%	-34,087%	6,9	45,12
2001	141.592.351	9,422%	87,838%	-78,417%	97,27	35,5
2000	75.379.944	12,897%	54,605%	-41,707%	-46,92	-1,51
1999	48.756.566	9,138%	55,347%	-46,208%	641,02	34,4
1998	31.385.646	12,894%	68,050%	-55,155%	-33,11	-4,45
1997	18.676.424	10,853%	103,568%	-92,715%	236,93	-2,88
1996	9.174.549	13,749%	114,971%	-101,222%	85,68	-26,22
1995	4.267.814	12,596%	76,853%	-64,258%	41,22	-11,5
1994	2.413.194	16,958%	107,258%	-90,300%	74,19	39,24
1993	1.164.343	12,938%	89,441%	-76,503%	630	43,73
1992	614.622					

OYSAC - OYSA ÇİMENTO						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	67.220.726	4,560%	115,597%	-111,036%	91,53	18,69
2002	31.178.950	4,078%	56,422%	-52,344%	34,17	57,09
2001	19.932.629	4,292%	38,844%	-34,551%	26,91	-22,27
2000	14.356.176	6,499%	51,380%	-44,880%	-10	46,33
1999	9.483.565	6,203%	31,497%	-25,295%	300,12	-18,15
1998	7.211.980	3,077%	80,926%	-77,849%	45,91	113,02
1997	3.986.140	2,595%	96,751%	-94,156%	154,07	2,3
1996	2.025.980	1,717%	95,919%	-94,202%	90,29	-18,41
1995	1.034.092	4,260%	75,756%	-71,496%	19,08	-28,05
1994	588.367	5,256%	117,347%	-112,091%	92,78	47,96
1993	270.704	5,103%	90,252%	-85,150%	317,39	-6,11
1992	142.287					

MRSHL - MARSHALL BOYA						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	117.282.003	5,779%	0,747%	5,032%	43,26	-11,23
2002	116.412.309	0,515%	49,935%	-49,420%	-10,1	5,26
2001	77.641.639	15,677%	22,010%	-6,333%	3,52	-36,59
2000	63.635.473	7,714%	47,387%	-39,672%	-22,71	25,67
1999	43.175.869	6,112%	43,108%	-36,996%	364,3	-5,02
1998	30.170.195	5,916%	32,990%	-27,073%	-3,93	40,26
1997	22.686.143	13,246%	107,723%	-94,477%	238,14	36,15
1996	10.921.360	6,010%	83,283%	-77,274%	58,89	-31,87
1995	5.958.728	8,757%	93,579%	-84,822%	117,28	31,28
1994	3.078.183	7,910%	100,051%	-92,141%	29,25	-0,8
1993	1.538.701	8,230%	66,209%	-57,979%	419,52	16,86
1992	925.765					

KORDS - KORDSA SABANCI DUPONT						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	340.745.200	3,421%	29,390%	-25,969%	65,79	-5,66
2002	263.346.732	3,478%	21,394%	-17,916%	-34,91	-11,64
2001	216.936.163	2,962%	122,481%	-119,519%	22,52	-15,84
2000	97.507.902	-1,536%	57,759%	-59,295%	-27,7	34,16
1999	61.808.000	5,979%	61,489%	-55,510%	382,86	-12,43
1998	38.273.786	20,641%	48,756%	-28,114%	-0,59	42,02
1997	25.729.316	19,782%	63,382%	-43,600%	114,88	-38,06
1996	15.747.944	21,114%	100,980%	-79,866%	233,27	32,43
1995	7.835.577	15,860%	123,863%	-108,003%	103,54	27,55
1994	3.500.162	5,739%	104,476%	-98,737%	81,05	44,72
1993	1.711.769	7,084%	63,114%	-56,031%	320	-17,31
1992	1.049.428					

KARTN – KARTONSAN						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	115.509.528	10,654%	4,814%	5,840%	88,3	16,68
2002	110.204.437	19,536%	60,972%	-41,436%	-1,78	15,01
2001	68.461.689	6,907%	38,739%	-31,832%	57,42	-3,57
2000	49.345.782	2,607%	77,145%	-74,538%	-10,17	46,05
1999	27.856.091	10,347%	77,855%	-67,508%	211,55	-36,27
1998	15.662.265	10,855%	31,974%	-21,119%	-15,46	23,42
1997	11.867.699	10,350%	107,859%	-97,510%	64,77	-33,66
1996	5.709.489	28,646%	12,255%	16,391%	113,45	-8,48
1995	5.086.185	18,470%	134,682%	-116,212%	80,28	8,93
1994	2.167.267	14,820%	157,395%	-142,575%	143,45	86,85
1993	842.001	3,487%	62,076%	-58,589%	812,67	105,3
1992	519.510					

BTCIM - BATI ÇİMENTO						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	163.634.945	10,955%	11,237%	-0,282%	-9,71	-44,05
2002	147.105.136	13,277%	33,769%	-20,492%	20,2	40,73
2001	109.969.686	3,767%	61,997%	-58,230%	103,85	24,86
2000	67.883.801	3,464%	59,635%	-56,171%	-39,33	10,95
1999	42.524.287	13,956%	34,888%	-20,932%	287,11	-20,81
1998	31.525.527	30,903%	62,381%	-31,478%	-47,71	-23,67
1997	19.414.582	14,960%	109,333%	-94,374%	209,4	24,57
1996	9.274.484	17,256%	96,396%	-79,141%	202,21	29,58
1995	4.722.332	21,487%	80,320%	-58,833%	-33,37	-59,74
1994	2.618.857					

BRISA – BRİSA						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	456.755.967	4,395%	30,242%	-25,847%	88,09	16,56
2002	350.698.206	4,058%	73,366%	-69,308%	4,57	22,44
2001	202.288.011	3,450%	35,001%	-31,551%	71,09	4,8
2000	149.842.038	10,037%	65,470%	-55,432%	-40,67	-3,54
1999	90.555.580	13,707%	26,541%	-12,834%	368,89	-4,08
1998	71.562.339	21,405%	55,348%	-33,943%	-50,6	-27,88
1997	46.065.876	21,004%	87,480%	-66,476%	118,69	-11,95
1996	24.571.051	16,747%	92,218%	-75,471%	255,68	52,51
1995	12.782.931	11,401%	134,843%	-123,442%	161,8	58,18
1994	5.443.179	8,214%	103,331%	-95,118%	62,54	24,75
1993	2.677.002	7,674%	60,973%	-53,299%	623,24	62,69
1992	1.663.017					

BOSSA –BOSSA						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	250.053.094	20,822%	-3,376%	24,198%	-15,43	-47,59
2002	258.789.938	7,453%	41,558%	-34,106%	27,23	48,97
2001	182.814.884	4,548%	112,006%	-107,458%	242,63	109,87
2000	86.231.020	8,932%	42,357%	-33,425%	-57,75	-31,3
1999	60.573.814	2,782%	24,102%	-21,320%	387,92	-0,18
1998	48.809.701	6,925%	33,713%	-26,787%	-25,95	8,1
1997	36.503.449	22,888%	80,628%	-57,739%	13,39	-54,35
1996	20.209.216	21,165%	84,530%	-63,365%	126,32	-2,96
1995	10.951.749					

BAGFS – BAGFAŞ						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	148.608.387	10,001%	5,823%	4,179%	44,17	-10,66
2002	140.431.419	14,915%	13,790%	1,125%	9,08	27,72
2001	123.413.331	5,970%	85,018%	-79,048%	58,05	-3,19
2000	66.703.464	10,461%	66,500%	-56,039%	-53,6	-24,57
1999	40.062.159	17,651%	39,376%	-21,725%	125,04	-53,96
1998	28.743.996	22,447%	31,010%	-8,563%	-9,71	31,82
1997	21.940.300	13,036%	131,399%	-118,363%	474,43	131,29
1996	9.481.568	6,628%	63,664%	-57,037%	42,29	-38,99
1995	5.793.297	18,787%	97,026%	-78,238%	171,05	63,77
1994	2.940.377	11,980%	81,040%	-69,060%	-25,15	-42,56
1993	1.624.161	10,469%	83,692%	-73,224%	909,07	126,98
1992	884.174					

PNSUT - PINAR SÜT						
Years	**Net Sales**	**SGR**	**Nominal Growth Rate**	**SGR-NGR**	**Return %**	**Relative Return%**
2003	252.767.309	6,650%	32,781%	-26,131%	36,92	-22,08
2002	190.364.297	0,956%	23,403%	-22,447%	-32,03	-7,72
2001	154.262.299	-1,174%	31,832%	-33,006%	112,53	45,98
2000	117.014.593	4,553%	61,517%	-56,964%	-52,23	-11,35
1999	72.447.259	10,595%	59,925%	-49,331%	709,01	46,73
1998	45.300.727	10,490%	85,022%	-74,532%	-40,51	-15,02
1997	24.483.963	5,223%	117,655%	-112,432%	318,57	20,66
1996	11.248.964	2,822%	104,726%	-101,904%	150	-0,66
1995	5.494.631	0,923%	119,868%	-118,946%	138,36	49,37
1994	2.499.056	25,315%	113,277%	-87,962%	-44,52	-55,65
1993	1.171.741	3,951%	69,762%	-65,811%	2.740,00	459,16
1992	690.226					

3. SGR – RGR - RELATIVE RETURN FOR THE FIRMS IN APPLICATION

MRDIN - MARDİN ÇİMENTO						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	6.291	5,242%	17,088%	-11,846%	66,86	3,4
2002	5.373	7,896%	-22,512%	30,408%	28,23	50,14
2001	6.934	7,313%	-4,103%	11,416%	129,29	40,44
2000	7.231	7,359%	13,011%	-5,651%	-20,95	28,52
1999	6.398	8,705%	8,295%	0,410%	382,12	-1,37
1998	5.908	5,034%	8,622%	-3,587%	71,91	150,98
1997	5.439	3,544%	15,231%	-11,687%	162,8	5,81
1996	4.720	5,196%	-5,176%	10,372%	11,35	-52,26
1995	4.978	8,583%	-13,561%	22,144%	59,55	-3,6
1994	5.759	5,910%	-12,292%	18,202%	38,57	6,35
1993	6.566	7,377%	2,089%	5,287%	228,57	-26,09
1992	6.432					

GOLTS - GOLTAŞ ÇİMENTO						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	7.571	15,941%	-17,510%	33,451%	26,54	-21,59
2002	9.178	1,140%	8,584%	-7,444%	15,37	35,08
2001	8.452	6,272%	15,441%	-9,169%	106,32	26,38
2000	7.322	8,778%	-7,452%	16,230%	-64,9	-42,93
1999	7.911	13,137%	-23,470%	36,607%	259,61	-26,43
1998	10.338	21,610%	-12,897%	34,507%	-35,15	-5,32
1997	11.868	21,687%	5,901%	15,786%	301,85	61,8
1996	11.207	18,556%	1,527%	17,029%	119,96	-5,69
1995	11.038	27,880%	0,965%	26,914%	21,1	-26,83
1994	10.933					

CIMSA - ÇİMSA ÇİMENTO						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	28.586	2,652%	11,119%	-8,467%	78,2	1,41
2002	25.725	5,608%	-3,036%	8,644%	6,9	45,12
2001	26.531	9,422%	24,090%	-14,668%	97,27	35,5
2000	21.380	12,897%	1,487%	11,410%	-46,92	-1,51
1999	21.067	9,138%	-2,385%	11,523%	641,02	34,4
1998	21.582	12,894%	-8,695%	21,590%	-33,11	-4,45
1997	23.637	10,853%	6,462%	4,391%	236,93	-2,88
1996	22.202	13,749%	10,193%	3,556%	85,68	-26,22
1995	20.149	12,596%	-9,678%	22,273%	41,22	-11,5
1994	22.307	16,958%	0,471%	16,487%	74,19	39,24
1993	22.203	12,938%	11,778%	1,159%	630	43,73
1992	19.863					

OYSAC - OYSA ÇİMENTO						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	6.969	4,560%	71,862%	-67,302%	91,53	18,69
2002	4.055	4,078%	8,574%	-4,496%	34,17	57,09
2001	3.735	4,292%	-8,277%	12,569%	26,91	-22,27
2000	4.072	6,499%	-0,630%	7,129%	-10	46,33
1999	4.098	6,203%	-17,371%	23,574%	300,12	-18,15
1998	4.959	3,077%	-1,699%	4,776%	45,91	113,02
1997	5.045	2,595%	2,897%	-0,302%	154,07	2,3
1996	4.903	1,717%	0,427%	1,290%	90,29	-18,41
1995	4.882	4,260%	-10,238%	14,498%	19,08	-28,05
1994	5.439	5,256%	5,362%	-0,106%	92,78	47,96
1993	5.162	5,103%	12,257%	-7,154%	317,39	-6,11
1992	4.598					

MRSHL - MARSHALL BOYA						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	12.159	5,779%	-19,690%	25,469%	43,26	-11,23
2002	15.140	0,515%	4,072%	-3,556%	-10,1	5,26
2001	14.548	15,677%	-19,398%	35,075%	3,52	-36,59
2000	18.049	7,714%	-3,251%	10,965%	-22,71	25,67
1999	18.656	6,112%	-10,075%	16,187%	364,3	-5,02
1998	20.746	5,916%	-27,744%	33,660%	-3,93	40,26
1997	28.712	13,246%	8,635%	4,612%	238,14	36,15
1996	26.430	6,010%	-6,050%	12,059%	58,89	-31,87
1995	28.131	8,757%	-1,135%	9,892%	117,28	31,28
1994	28.455	7,910%	-3,023%	10,932%	29,25	-0,8
1993	29.341	8,230%	-1,930%	10,160%	419,52	16,86
1992	29.919					

KORDS - KORDSA SABANCI DUPONT						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	35.327	3,421%	3,143%	0,278%	65,79	-5,66
2002	34.250	3,478%	-15,739%	19,217%	-34,91	-11,64
2001	40.648	2,962%	46,975%	-44,013%	22,52	-15,84
2000	27.656	-1,536%	3,558%	-5,094%	-27,7	34,16
1999	26.706	5,979%	1,475%	4,504%	382,86	-12,43
1998	26.318	20,641%	-19,178%	39,819%	-0,59	42,02
1997	32.563	19,782%	-14,555%	34,337%	114,88	-38,06
1996	38.110	21,114%	3,021%	18,093%	233,27	32,43
1995	36.992	15,860%	14,331%	1,529%	103,54	27,55
1994	32.355	5,739%	-0,877%	6,617%	81,05	44,72
1993	32.642	7,084%	-3,755%	10,839%	320	-17,31
1992	33.915					

KARTN - KARTONSAN						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	11.975	10,654%	-16,448%	27,102%	88,3	16,68
2002	14.333	19,536%	11,733%	7,804%	-1,78	15,01
2001	12.828	6,907%	-8,346%	15,253%	57,42	-3,57
2000	13.996	2,607%	16,283%	-13,676%	-10,17	46,05
1999	12.036	10,347%	11,759%	-1,412%	211,55	-36,27
1998	10.770	10,855%	-28,296%	39,151%	-15,46	23,42
1997	15.020	10,350%	8,706%	1,644%	64,77	-33,66
1996	13.817	28,646%	-42,459%	71,105%	113,45	-8,48
1995	24.012	18,470%	19,856%	-1,387%	80,28	8,93
1994	20.034	14,820%	24,776%	-9,956%	143,45	86,85
1993	16.056	3,487%	-4,368%	7,855%	812,67	105,3
1992	16.789					

BTCIM - BATI ÇİMENTO						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	16.965	10,955%	-11,328%	22,283%	-9,71	-44,05
2002	19.132	13,277%	-7,150%	20,427%	20,2	40,73
2001	20.605	3,767%	7,018%	-3,251%	103,85	24,86
2000	19.254	3,464%	4,789%	-1,325%	-39,33	10,95
1999	18.374	13,956%	-15,240%	29,197%	287,11	-20,81
1998	21.678	30,903%	-11,775%	42,678%	-47,71	-23,67
1997	24.571	14,960%	9,477%	5,483%	209,4	24,57
1996	22.444	17,256%	0,672%	16,584%	202,21	29,58
1995	22.294	21,487%	-7,907%	29,394%	-33,37	-59,74
1994	24.209					

BRISA – BRİSA						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	47.354	4,395%	3,822%	0,573%	88,09	16,56
2002	45.611	4,058%	20,335%	-16,277%	4,57	22,44
2001	37.903	3,450%	-10,816%	14,265%	71,09	4,8
2000	42.500	10,037%	8,619%	1,418%	-40,67	-3,54
1999	39.128	13,707%	-20,486%	34,192%	368,89	-4,08
1998	49.208	21,405%	-15,596%	37,001%	-50,6	-27,88
1997	58.301	21,004%	-1,952%	22,956%	118,69	-11,95
1996	59.462	16,747%	-1,470%	18,217%	255,68	52,51
1995	60.349	11,401%	19,939%	-8,538%	161,8	58,18
1994	50.316	8,214%	-1,432%	9,646%	62,54	24,75
1993	51.048	7,674%	-5,019%	12,693%	623,24	62,69
1992	53.745					

BOSSA –BOSSA						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	25.924	20,822%	-22,976%	43,798%	-15,43	-47,59
2002	33.658	7,453%	-1,743%	9,196%	27,23	48,97
2001	34.255	4,548%	40,055%	-35,507%	242,63	109,87
2000	24.458	8,932%	-6,553%	15,485%	-57,75	-31,3
1999	26.173	2,782%	-22,018%	24,800%	387,92	-0,18
1998	33.563	6,925%	-27,351%	34,277%	-25,95	8,1
1997	46.199	22,888%	-5,535%	28,424%	13,39	-54,35
1996	48.906	21,165%	-5,411%	26,576%	126,32	-2,96
1995	51.704					

BAGFS – BAGFAŞ						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	15.407	10,001%	-15,644%	25,645%	44,17	-10,66
2002	18.264	14,915%	-21,018%	35,932%	9,08	27,72
2001	23.124	5,970%	22,227%	-16,257%	58,05	-3,19
2000	18.919	10,461%	9,295%	1,165%	-53,6	-24,57
1999	17.310	17,651%	-12,420%	30,071%	125,04	-53,96
1998	19.765	22,447%	-28,820%	51,266%	-9,71	31,82
1997	27.768	13,036%	21,017%	-7,981%	474,43	131,29
1996	22.945	6,628%	-16,106%	22,734%	42,29	-38,99
1995	27.350	18,787%	0,625%	18,163%	171,05	63,77
1994	27.181	11,980%	-12,239%	24,218%	-25,15	-42,56
1993	30.971	10,469%	8,387%	2,082%	909,07	126,98
1992	28.575					

PNSUT - PINAR SÜT						
Years	**Adjusted Sales**	**SGR**	**Adjusted Growth Rate**	**SGR-RGR**	**Return %**	**Relative Return%**
2003	26.206	6,650%	5,846%	0,804%	36,92	-22,08
2002	24.758	0,956%	-14,345%	15,301%	-32,03	-7,72
2001	28.905	-1,174%	-12,909%	11,735%	112,53	45,98
2000	33.189	4,553%	6,024%	-1,472%	-52,23	-11,35
1999	31.303	10,595%	0,492%	10,102%	709,01	46,73
1998	31.150	10,490%	0,526%	9,964%	-40,51	-15,02
1997	30.987	5,223%	13,829%	-8,606%	318,57	20,66
1996	27.222	2,822%	4,942%	-2,119%	150	-0,66
1995	25.940	0,923%	12,291%	-11,368%	138,36	49,37
1994	23.101	25,315%	3,389%	21,926%	-44,52	-55,65
1993	22.344	3,951%	0,167%	3,784%	2.740,00	459,16
1992	22.307					

REFERENCES

Books

Arnold, Glen, **Corporate Financial Management**, 2nd edition, United Kingdom, Prentice Hall, 2002.

Brealey, Richard A. and Stewart C.Myres, **Principles of Corporate Finance,** New York, McGraw-Hill, 1996.

Canals, Jordi. **Managing Corporate Growth**, Oxford University Press, 2000.

Clark, John J., Thomas C.Chiang and Gerard T.Olson, **Sustainable Corporate Growth A Model and Management Planing Tool**, USA, Quorum Books, 1989.

Clarke, Roger G., Brent Wilson, Robert H.Daines and Stephen D.Nadauld, **Strategic Financial Management**, Richard D. Irwin, Homewood, Illinois., 1988.

Damodaran, Aswath. **Investment Valuation Tools and Techniques for Determining the Value of Any Asset**, University Edition, USA, John Wiley & Sons, Inc.,1996.

Efil, İsmail, **İşletmelerde Yönetim ve Organizasyon**, 7.Baskı, İstanbul, Alfa Yayınları, 2002.

Higgins, Robert C. **Analysis for Financial management**, 2nd edition, 1989.

Koçel Tamer, **İşletme Yöneticiliği**, 7.baskı, İstanbul, Beta Yayınları, 1999.

Ross, Stephen A., Randolph W.Westerfield and Jeffrey Jaffe, **Corporate Finance,** 6th edition, McGraw-Hill, 2002.

Sümer, Haluk and Pernsteiner, Helmut, **Şirket Birleşmeleri**, 1.Baskı, İstanbuş, Alfa Yayınları, 2004.

Periodicals

Baş, İ.Melih., and M.Ali, Seyhun, "İşletmelerde Sürdürülebilir Büyüme", **İşletme ve Finans**, Eylül 1993, Sayı:90.

Beneda, Nancy L. "Estimating Free Cash Flows and Valuing a Growth Company", **Journal of Asset Management**, Dec 2003; 4, 4.

Brush, H.Thomas, Philip Bromiley and Margaretha Hendrickx. "The Free Cash Flow Hypothesis for Sales Growth and Firm Performance ", **Strategic Management Journal**, Vol.21, No.4, Apr.2000.

Clark, John J., Margaret T.Clark and Andrew G.Verzilli, "Strategic Planning and Sustainable Growth Fall", **Columbia Journal of World Business**, 1985.

Coley, Stephen. "Growing Through the Downturn", **Asian Business**, Mar.1999; 5, 3.

Eisemann, Peter C. "Another Look at Sustainable Growth," **Journal of Commercial Bank Lending**, October 1984.

Firer, Colin. "Driving Financial Performance Through the Du Pont Identity: A Strategic Use of Financial Analysis and Planning", **Financial Practice and Education**, Spring/Summer, 1999.

Govindarajan, Vijay and John K.Shank. "Cash Sufficiency: The Missing Link in Strategic Planning", **Corporate Accounting**, Winter 1984.

Hamman, Willie D. "Sustainable growth: A cash flow model - Investment Basics XXXIII", *The Investment Analysts Journal,* 2002, Number 43, Part 5, http://www.fin24.co.za/register/help/mmx_school/displayarticlewide.asp?ArticleID=276232 (09.11.2005)

Higgins, Robert C. "How Much Growth Can a Firm Afford", **Financial Management**, Fall 1977,6, 3.

Higgins, Robert C. "Sustainable Growth Under Inflation", **Financial Management,** Autumn 1981; 10,4.

Johnson, Dana J. "The Behavior of Financial Structure and Sustainable Growth in an Inflationary Environment", **Financial Management**, Autumn 1981.

Kyd, Charles W. "Managing the Financial Demands of Growth", **Management Accounting**, Dec:1981.

Mangier, Susan M. "The Eponymous Dupont Model", **Valuation Strategies**, January/February 2004

Meriden, Trevor. "The Challenges of Hypergrowth", **Management Review,** Nov.1999;8,10.

Modigliani, Franco and Merton H.Miller , "The Cost of Capital, Corporation Finance and the Theory of Investment", **The American Economic Review**, Vol. 48, No.3, Jun., 1958.

Platt, Harlan D., Marjorie B. Platt and Guangli, "Sustainable Growth Rate of Firms in Financial Distress", **Journal of Economics and Finance**, Volume 19, Number 2, Summer 1995.

Chen, "Sustainable Growth Rate of Firms in Financial Distress", **Journal of Economics and Finance**, Volume 19, Number 2, Summer 1995.

Sammer, Joanne. "More, Please! Part Two of a Series", **Business Finance**, July 2000.

Slater Stanley F. and Eric M.Olson, "A Value-Based Management System", **Business Horizon**, September-October 1996

Tarantino, David, "Nuts and Bolts of Business-Determining Sustainable Growth", **The Physician Executive***,* 2004, November/December.

Others

Ebberson Bob."Matching Growth, Financial Resources is a Balancing Act", http://www.nhsbdc.org/Article11_Matching%20Growth%20and%20Money.htm, (01.02.2006).

Gappa, Robert. *What is Franchising?*http://www.franchising.com/fuadmin/articles/article_WhatisFranchising3.shtml (01.10.2005).

Going Public Disadvantages, http://www.penn-capital.com/english/gp-disadvan.html (01.11.2005).

How Fast is Too Fast?, http://www.exceluser.com/tools/pub_howfast.htm (20.10.2005).

IOMA's Report on Financial Analysis, Planning & Reporting, **How Companies will Finance Growth Plans for 2006 Anonymous,** Jun 2005; 05, 06.

Price, Allan M. And Collins C. Maureen, "Turning Vision into Value", **Goalfix Corporation**, Johannesburg, SA, 1995.

Şensoy, Necdet."International Accouting Standards Lecture Notes", Marmara University Institute of Social Science, 2004.

The BCG Growth-Share Matrix, http://www.netmba.com/strategy/matrix/bcg/ (02.01.2006).

Timoth, Koller y, "What is Value Based Management", The McKinSey Quarterly, 1994, Number 3

Var, Tarık.*"Firma Düzeyinde Sürdürülebilir Büyüme"* , İTÜ Fen Bilimleri Enstitüsü (Yüksek Lisans Tezi) Haziran 1998.

Weaver, C.Samuel and Weston, J. Fred, "A Unifying Theory of Value Based Management", *Finance* Paper 4-03., 2003,http://repositories.cdlib.org/anderson/fin/4-03 (02.04.2006).