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

AN OVERVIEW OF BUSINESS VALUATION TECHNIQUES WITH AN IMPLEMENTATION OF THE DISCOUNTED ABNORMAL EARNINGS METHOD

Yüksek Lisans Tezi

SEDA PEREK

İstanbul, 2009

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

AN OVERVIEW OF BUSINESS VALUATION TECHNIQUES WITH AN IMPLEMENTATION OF THE DISCOUNTED ABNORMAL EARNINGS METHOD

Yüksek Lisans Tezi

SEDA PEREK

Danışman: Doç Dr. Jale Sözer Oran

İstanbul, 2009

Marmara Üniversitesi
Sosyal Bilimler Enstitüsü Müdürlüğü

Tez Onay Belgesi

İŞLETME Anabilim Dalı MUHASEBE FİNANSMAN(İNG) Bilim Dalı Yüksek Lisans öğrencisi SEDA PEREK nın AN OVERVIEW OF BUSINESS VALUATION TECHNIQUES WITH AN IMPLEMENTATION OF THE DISCOUNTED ABNORMAL EARNINGS METHOD adlı tez çalışması ,Enstitümüz Yönetim Kurulunun 28.05.2009 tarih ve 2009-9/33 sayılı kararıyla oluşturulan jüri tarafından oybirliği/oyçokluğu ile Yüksek Lisans Tezi olarak kabul edilmiştir.

	Öğretim Üyesi Adı Soyadı	İmzası
Tez Savunma Tarihi :	9.1.6.1.2009	
1) Tez Danışmanı :	DOÇ. DR. JALE SÖZER ORAN	
2) Jüri Üyesi :	PROF. DR. MUSTAFA HAYRİ KOZANOĞLU	
3) Jüri Üyesi :	YRD. DOÇ.DR. TUBA DUMLU	

ACKNOWLEDGEMENTS

I am grateful for the valuable contributions of my advisor Assc. Prof. Dr. Jale Sözer Oran who has been delightfully supportive at all of the stages of my studies.

I am also thankful to Prof. Dr. Hayri Kozanoğlu and Asst. Prof. Dr. Tuba Dumlu for joining my thesis committee and their support.

I would also like to thank my husband Ali Atilla Perek for his continuous support through various means of communication and to my sister Ceyda Gürol, my mother Ayfer Gürol, my father Tahir Gürol and all of my colleagues for their contributions, patience and friendship.

ABSTRACT

Valuation topic is of crucial interest to the finance world. Therefore it is one of the most scrutinized fields of finance. Business valuation in particular is one of the most attractive areas for research. As a consequence of this intense researching, many methods of business valuation have emerged. In this study, an overall assessment of the business valuation models is aimed together with an application of one of the models, which might be considered a relatively new one, the abnormal earnings method. The benefits and limitations of the methods are also mentioned in the study.

The abnormal earnings method is applied on five publicly held companies, listed on the Istanbul Stock Exchange, from various sectors. The results of the valuation are then compared to market prices and values obtained from the Gordon's growth model where applicable. The results obtained from the application indicate that market might be undervaluing these companies. This may be caused by the crisis being undergone by world economies since the year 2008.

The application of the abnormal earnings method is feasible and might even be more feasible than the dividend discount model for Turkish companies in that Turkish economy is an emerging one and the capital needs of the relatively young companies may keep them from distributing dividends consistently. Moreover, the abnormal method itself has its superiorities evidenced by empirical research as compared to other valuation techniques.

ÖZ

Değerleme konusu finans dünyasında önemli bir yere sahiptir. Bu nedenle finans alanının en çok araştırılan bölümlerinden biri olmuştur. Özellikle işletme değerlemesi konusu en ilgi çekici araştırma alanlarında biridir. Bu yoğun araştırmaların bir sonucu olarak birçok değerleme yöntemi geliştirilmiştir. Bu çalışmada bu değerleme yöntemlerinin genel bir değerlendirilmesi ile birlikte bu yöntemlerden biri olan ve nispeten yeni sayılabilecek bir yöntem olan normalüstü kazanç yönteminin bir uygulamasının yapılması hedeflenmiştir. Diğer yöntemler ile birlikte bu yöntemin de faydaları ve sınırlamalarından bahsedilmiştir.

Normalüstü kazanç yöntemi İstanbul Menkul Kıymetler Borsası'nda işlem gören halka açık, değişik sektörlerden beş şirket üzerinde uygulanmıştır. Değerlemenin sonuçları piyasa değerleri ile ve uygun olduğu hallerde Gordon modeli ile karşılaştırılmıştır. Uygulamadan alınan sonuçlar bu şirketlerin piyasada olması gerekenden düşük değerleniyor olabileceğini göstermiştir. Bunun nedeni ise 2008 yılından bu yana dünya ekonomilerince yaşanmakta olan krize bağlanabilir.

Türkiye ekonomisi gelişmekte olan bir ekonomi olduğundan ve bu ekonomiyi oluşturan firmaların nispeten genç oluşunun sermaye gerekliliklerini artırmasından dolayı bu firmaların düzenli ve tutarlı bir temettü dağıtma imkânları olmamaktadır. Bu nedenle, normalüstü kazanç yönteminin uygulanması mümkün olmakla birlikte belki de indirgenmiş temettü yönteminden daha da uygundur. Bunun yanında, normalüstü kazanç yönteminin deneysel araştırmalar ile kanıtlanmış diğer yöntemler üzerinde kendi üstünlükleri de mevcuttur.

TABLE OF CONTENTS

LIST OF TABLES

Page No.

LIST OF FIGURES

Page No.

LIST OF SYMBOLS / ABBREVIATIONS

ARIMA	Autoregressive Integrated Moving Average
ATM	Automatic Telling Machine
b	Retention Ratio
CAPM	Capital Asset Pricing Model
CF to Equity	Expected Cash Flow To Equity in Period t
CF to Firm	Expected Cash Flow to Firm in Period t
CF_t	Cash Flow in Period t
D_0	Dividend Paid During the Last 12 Months
DCF	Discounted Cash Flow
DDM	Dividend Discount Model
D_t	Expected Dividends in Period t
E(Abnormal Earnings$_{t+3}$)	Expected abnormal earnings of the third year of the forecasting period
E(Dividends$_t$)	Expected Dividends for the Period t
E(D_t)	Expected Dividend at Time t
E(e_t)	Forecasted Earnings for the Period t
EVA	Economic Value Added
FAS	Financial Accounting Standards
FASB	Financial Accounting Standards Board
g	Expected Growth Rate
GDP	Gross Domestic Product
IFRS	International Financial Reporting Standards

ISE	Istanbul Stock Exchange
k_e	Cost of Equity
r	Appropriate Discount Rate Reflecting the Riskiness of the Cash Flows
r_f	Risk Free Rate of Return
RIM	Residual Income Model
r_m	Market Rate of Return
WACC	Weighted Average Cost of Capital
$\emptyset$	Autoregressive Coefficient
β	Beta of the Company

LIST OF APPENDICES

1. INTRODUCTION

Valuation is a crucial tool of many financial decisions; and so it is at the heart of the field of finance. Valuation techniques are referred to in every decision to invest in an asset. While many theories currently preserve their places in current valuation occasions, new offerings are evolving in the last decade to the existing techniques, promising to better them off under certain circumstances. This thesis is concerned with firm valuation techniques or valuation of a going concern. Different approaches are analyzed for their strengths and weaknesses and relatively new models are tested against older models in an empirical test, and values of five enterprises listed on the Istanbul Stock Exchange (ISE) are calculated using the abnormal earnings method.

The classical valuation models have their uncertainty involved within themselves, indeed valuation as a whole has much to do with uncertainty, because of the estimations and forecasting involved in the process. Despite of the fact that valuation tools are prone to uncertainty, there is no other means to rely on while making an investment. When financial assets are concerned, value is backed up by reality and that reality is future expected cash flows and value of financial assets is not affected by perceptions as it would be the case for artistic goods.

A range of valuation models is used in practice which can be classified into three categories: discounted cash flow valuation, relative valuation and contingent claim valuation. Usually a fourth one is also added to these: accounting based valuation. These categories are associated with income approach, market approach and cost approach, respectively.[1] There are a number of different models under each approach and there are significant differences in value across different models, thus choosing the right model to use for a specific occasion is a difficult task.[2] Among these techniques discounted cash flow (DCF) valuation is the most frequently used one in practice. This may be due to the fact that the foundation on which all other valuation models are built upon is discounted cash flow valuation.

Discounted cash flow valuation models find the present value of the expected cash flows on an asset. In order to do this the models require three inputs: the life of the asset, expected cash flows for each year and an appropriate discount rate. The models focus on

[1] Bertoncel, Andrej; "Acquisition Valuation: How to Value a Going Concern", **Our Economy (Nase Gospodarstvo)**, 2006, Vol. 52 Issue 5/6, p.118

[2] Damodaran, Aswath; **Investment Valuation**, New York: John Wiley & Sons Inc., 2002, p. 11

intrinsic value and based on empirical evaluation in the literature these models are found to work best when cash flows are positive.[3] The other approach, which is relative valuation, works on the basis of finding similar assets in the market, determining a standardized price through multiples, such as earnings, book value or revenue multiples, and controlling for the differences between the asset being valued and the similar one.[4] The third approach is based on real option pricing which is used best for the companies in trouble, high technological companies with interesting ideas and no cash flows. Accounting based valuation focuses on doing asset based valuation, and the emphasis is on book value.

The method examined in this study is a hybrid approach including insights from both the income approach and the cost approach. The abnormal earnings method includes in the value of a company not only the discounted future abnormal earnings but also the book value of the company as of the valuation day.

The next section is a review of significant research in the literature about the topic. The third section explores the valuation techniques as a whole and the fourth section is about excess return models only. The fifth section contains information about the methodology and data employed, and the method application. The last section is saved for concluding remarks.

[3] Ibid. p.16

[4] Damodaran, Aswath; "Valuation Approaches and Metrics", **Foundations and Trends in Finance**, 2005, Vol. 1 No. 8, p.753-754

2. REVIEW OF VALUATION RELATED LITERATURE

Before examining the recent developments on the research about the excess return models on valuation, a short review of the concepts of value and valuation process are provided.

1.1 VALUE

Values of assets have always been of interest to people throughout the whole history. In different ages and within different cultures value has been represented by different materials and today it is represented by money. Basically, the definition of value today is the amount of money which something is worth[5]. In economics, value is the exchange value of an asset, that is, value of a unit of an asset is measured by the units of the other asset or currency, which is traded in exchange for that asset. Therefore, the value of the asset depends on its desirability and its scarcity. If an asset is desired and also scarce at the mean time, then that asset will be of higher exchange value.[6]

The economists have stated various opinions on value which can be classified into theories. The first one is the value in use theory, which was pointed out by the Marxist theory. According to this theory the concept of value represents two separate meanings: value in use and exchange value.[7] These two should not equal each other; an asset may have a high value in use but low exchange value and vice versa.[8] The other theory is the labor theory of value where it is claimed that the value of an asset is measured by the amount of labor needed to produce it. Labor theory of value is the centre of Karl Marx's theories. He claims that the relative values of assets are determined by the amount of social labor crystallized in them.[9] The third theory is the marginal utility theory which was originated by A. Marshall. The theory implies that utility received from a good affects the demand for that good and thus,

[5] Black, A. and C.; **Dictionary of Economics**, London: A & C Black Publishers Ltd., 2006, p.211

[6] Baumol, William J.; Blinder, Alan S.; **Economics: Principles and Policy**, Orlando: The Dryden Press, 1998, p. 96

[7] Boztepe, Suzan; "User Value: Competing Theories and Models", **International Journal of Design**, Vol. 1 No.2, 2007, p. 55-63

[8] Case, Karl E.; Fair, Ray C.; **Principles of Economics**, New Jersey: Prentice Hall, Inc., p.144

[9] Ibid. p.892

utility and cost determine value together.[10] Other social scientists have also claimed that value has a psychological aspect and is determined by the psychologies, judgements and preferences of people and communities.[11] Thus, the value has two dimensions as subjective value and objective value. Subjective value may be based the personal desires of one, and objective value is determined by the utilities expected from and the costs related to that asset.

1.2 VALUATION PROCESS

The determination of the value of an asset is the subject of valuation practices. In accordance with the purpose of this thesis, the following chapters will focus on the valuation of businesses, where it is aimed to reach the fair value of the businesses. This gives rise to the need for the explanation of what fair value means. Fair value is defined as "the amount at which property would change hands between a willing seller and a willing buyer when neither is acting under compulsion and when both have reasonable knowledge of the relevant facts."[12]

The value generating ability and thus the fair value of a business is affected by the state of the industry and the economy, in which the company operates, size of the company, product pricing, liquidity, historical earnings and future potentials, and planned capital investments to list but a few. These factors affect the profitability of and the risk related to a firm and thus the value of it. Together with the analytical techniques the experience and subjective evaluations of the persons performing the valuation will also be effective.

The need for valuation arises on various grounds such as the disposing of assets to finance new investments, mergers and acquisitions to create synergy, calculation of the share of a leaving partner or determination of the price in an initial public offering, bankruptcy, and privatization. Moreover, it may be claimed that nearly every business decision involves valuation; capital budgeting and strategic planning decisions within the firm and security analysts' and acquirers' efforts to support their recommendations and decisions outside the

[10] Baumol, et. al. op. cit. p. 97

[11] Boztepe, op. cit. p. 55-63

[12] Pratt, Shannon P.; **Valuing Small Businesses and Professional Practices**, Blacklick: The McGraw-Hill Companies, 1998. p 39.

firm all involve valuation. Furthermore, the credit analysts also do consider the value of the firm to assess its riskiness.[13] Basically, any valuation process follows the steps below[14]:

- Identification of the asset appraisal problem
- Data collection and analysis
- Application of a valuation method
- Estimation of the value

There are three approaches to valuation which are accepted in all of the accounting and valuation standards; these are:

- Income approach,
- Cost approach, and
- Market approach.

These three approaches were officially established in 1936 for the valuation of assets. Before that, although there were several methods for valuing assets, a generally accepted classification was not existent[15]. Today, International Valuation Standards, Standards of Professional Appraisal Practice (United States), Business Valuation Standards (United States), Appraisal and Valuation Standards (United Kingdom), and European Valuation Standards (European Union) directly mention the three approaches for the valuation process. In addition to these standards on valuation, International Financial Reporting Standards (IFRSs), Financial Accounting Standards (FASs) and other accounting standards indirectly mention about the three approaches. Even though the accounting standards do not name or classify valuation methods, one of the three methods is recommended or required by them for all fair value determinations.

Each of these valuation approaches has basic analytic objectives and economic principles to find a reasonable indication of a defined value for the asset subject to valuation.

[13] Palepu, Krishna G.; Healy, Paul M.; Bernard, Victor L.; **Business Analysis and Valuation**, Ohio: South-Western, 2004, p.7-1

[14] Reilly, Robert F.; Schweihs, Robert P.; **Valuing Intangible Assets**, New York: McGraw Hill, 1999, p. 88

[15] Mundy, Bill; "The Scientific Method and the Appraisal Process", **the Appraisal Journal**, Vol. 60, Issue 4, 1992, p.493-499

The cost approach is based upon the economic principle of substitution. The market approach is based upon the related economic principles of competition and equilibrium. The income approach is based upon the economic principle of anticipation[16]. The methods used in practice involve one or more of these approaches. According to the Guidance Note 6 of the International Valuation Standards the basic insights of the approaches may be summarized as follows:[17]

Income Approach: The basis of the income approach is that the value of a business depends on the future economic benefits that will accrue to it. The calculation of the value includes the discounting of these future economic benefits to present, with an appropriate discount rate, which represents the risks involved in the generation of these benefits. In practice, this approach finds presence in discounted net cash flow applications or dividend discount models. In fact, many definitions of cash flows may be used. The discount rate used in the calculations must be in line with the definition of the cash flow to be discounted. The expected revenues or gains must be determined by taking the expected growth and the timing of these revenues or gains, and the risk and the time value of money into account together with the capital structure, past performance and industry specific and general economic factors.

Market Approach: According to the International Valuation Standards Guidance Note 6, market approach, in general, requires the evaluation of a business, equity stake in a business or marketable securities based on the comparison between the sale of similar businesses, equity stakes and marketable securities. Applying the market approach in a valuation process the comparisons made with the other businesses must have a fair ground so that the comparison is meaningful and not deceiving. The importance of the similarities between the companies, the accuracy and the verifiability of the data, and the independency and the objectivity of the analysis is underscored by the guidance note.

Cost Approach: According to the cost approach, the expected future benefits from an asset is best measured by the cost to reproduce or replace that asset; based on the assumption that a prudent investor would not spend more to create or buy an asset than its expected future economic benefits. Thus, the estimation of the cost to reproduce or replace the asset is a good

[16] Robert F. Reilly, "The Valuation of Intangible Assets", **National Public Accountant**, Vol. 41, Issue 7, 1996, p.28
[17] Capital Markets Board, Communiqué Serial 8, No.45, Turkish Valuation Standards, Guidance Note 6

indicator of fair value.[18] In essence, the cost approach is an asset based approach where each asset whether tangible or intangible is subject to the determination of its market value or another value that represents its current value, rather than the historical one. In this case, if the market values or liquidation values are used some expenses such as selling and other expenses should be taken into account together with taxes. The entities that might use this approach in valuation are given in the guidance note as real estate companies or companies that perform agricultural operations or a case where the entity is valued based on a ground other than the going concern principle. According to the Guidance Note, this approach shall be based on a fair justification that it should be used; otherwise this method shall not be the sole one in valuation processes of going concerns.

As stated earlier, the methods used in practice involve one or more of these approaches. The methods that are frequently used in practice will be examined in detail in the third section.

2.3 RECENT DEVELOPMENTS IN THE VALUATION LITERATURE

Of the valuation models that are most investigated and the most compared to one another are the discounted cash flow valuation techniques and the abnormal earnings models. In their article Vincent et al quote the works of Brealey and Myers who claim that the strength of the discounted cash flow models is in its corporate finance roots which emphasize cash flows. They also quote that practical books on valuation such as the one by Copeland assert that cash flows dominate accounting earnings and therefore the DCF model is preferred over accounting based models.[19]

One of the landmark papers in literature is the one by Ohlson where a framework is provided as how market value relates to three accounting data, earnings, book value and dividends. The model provided in the paper relies on the clean surplus relationship that is the change in the book value equals earnings minus dividends. By stating dividends, it is implied that those are net of capital contributions, i.e. negative dividends.[20] As a matter of fact this conclusion was first reached in the paper by Preinreich in 1938 where the author states that

[18] Gordon J. Smith, **Trademark Valuation**, New York, John Wiley & Sons Inc., 1996, p. 82

[19] AAA Financial Accounting Standards Committee, "Equity Valuation Models and Measuring Goodwill Impairment", **Accounting Horizons**, 2001, Vo.15 No.2, p. 164

"Capital value equals book value plus the excess profits."[21] However, according to Lundholm this notion was largely ignored in the accounting literature since then. The author considers the revival of this idea as a major contribution to modern financial accounting.[22] One of the papers that advocate the view of the residual income model (RIM) and the superiority of accounting earnings over cash flows is the one by Penman and Sougiannis. In that study it is claimed by the authors that accrual accounting overcomes a shortcoming of the DCF models, i.e. the DCF models subtract long term capital investments from operating cash flows to estimate free cash flow, and this creates a circumstance where for some of the firms this means negative free cash flows for many years. Accrual accounting-based valuation models overcome this shortcoming by placing them on the balance sheet and matching the cost of these investments against inflows from them through depreciation allocations.[23]

Penman and Sougiannis also demonstrate that the use of accrual accounting allows for more reasonable valuations than the DCF model using forecasted payoffs over relatively short horizons. The DCF's reliance on free cash flows may require many more years of forecasts to attain steady state and positive free cash flows. The authors also question the reasoning behind the omitting accruals in the short term forecasting horizon and then adding them back in through the terminal value calculation while it is also possible to use the forecasted accrual numbers instead. Accounting academicians mostly prefer abnormal earnings methodology because of its direct relation to earnings and book values that are central concepts in accrual accounting, where as DCF valuation has its roots in finance theory.[24] Vincent et al quote that researchers also unveil another advantage of the abnormal earnings methods which is the fact that accounting choices regarding conservatism, expensing or capitalizing research and development costs, and different depreciation methods do not affect the computation of value as long as the clean surplus relationship is in use. While this is the case for these models, DCF

[20] Ohlson, James A.; "Earnings, Book Values, and Dividends in Equity Valuation", **Contemporary Accounting Research**, 1995, Vol.11 No.2, p. 661-662

[21] Preinreich, Gabriel A. D.; "Annual Survey of Economic Theory: The Theory of Depreciation", **Econometrica**, 1938, Vol.6 No.3, p.240

[22] Lundholm, Russell J.; "A Tutorial on the Ohlson and Feltham/Ohlson Models: Answers to Some Frequently Asked Questions", **Contemporary Accounting Research**, 1995, Vol.11 No.2, p.751

[23] Penman, Stephen H.; Sougiannis, Theodore; "A comparison of Dividend, Cash Flow, and Earnings Approaches to Equity Valuation", **Contemporary Accounting Research**, 1998, Vol.15 No.3, p. 376

[24] AAA Financial Accounting Standards Committee, op. cit. p.164

models require cumbersome effort to convert accrual based accounting measures to cash flow basis.[25]

One of the first of the recent empirical studies of the abnormal earnings method is the one by Bernard where the author estimates intrinsic value for a large sample of firms during 1978-1993 using Value Line earnings forecasts for four years, to demonstrate the validity of the model over short horizons. Bernard reports in his study that the model explains, on average, 68 percent of the variation in share price.[26] Bernard advocates the model for its accuracy and for its reliance on earnings and book value predictions over relatively short time periods compared with the longer periods generally needed for the DCF model.[27]

Penman and Sougiannis (1998) compare the dividend discount, discounted cash flow and residual income models using actual realizations of dividends, free cash flows and earnings as proxies for the forecasts. This approach minimizes the impact of different magnitudes of forecast errors for the three forecast variables. The authors group the firms into 20 portfolios to average out the effects of differences between market expectations and the realizations of the three forecast variables. They report that the residual income model yields smaller valuation errors, as measured against current stock prices, than either the dividend discount model (DDM) or discounted cash flow model.[28]

Lee et al. use the residual income model to estimate the intrinsic value of the Dow Jones Industrial Average over the period from 1963 to 1996. They use security analysts' consensus earnings forecasts after 1979 when they became available and time-series projections of earnings before that.[29] Their estimates of intrinsic value predict both the future value of the index and the future stock returns to the index. Based on these results the authors advocate the use of the residual income model over alternative valuation models.

---

[25] Ibid. p.165

[26] Bernard, Victor L.; "The Feltham-Ohlson Framework: Implications for Empiricists", **Contemporary Accounting Research**, 1995, Vol. 11 Issue 2, p. 739

[27] AAA Financial Accounting Standards Committee, op. cit. p.166

[28] Penman, et.al "A comparison of Dividend, Cash Flow, and Earnings Approaches to Equity Valuation", op. cit. p.358

[29] Lee, Charles M. C.; Myers, James; Swaminathan, Bhaskaran; "What is the Intrinsic Value of the Dow", **Journal of Finance**, 1999, Vol. 54 Issue 5, p. 1736-1737

Another paper that compares the accuracy of the dividend discount model, residual income model and discounted cash flow valuation model is the one by Francis et al. The authors use a sample of five years forecasts into the future for nearly 3000 firms year observations during 1989- 1993. They find that the RIM explains about 71 percent of the variance in stock prices. According to their tests the RIM significantly outperforms both the dividend and the DCF valuation models. Their valuation benchmark is stock price, thus assuming market efficiency. They state that the greater accuracy of the RIM is likely to be due to the sufficiency of book value of equity as a measure of intrinsic value and the predictability and the precision of abnormal earnings are greater.[30]

Some studies also provide that the residual income model has not much explanatory power than other models. For example, Dechow et al. test the residual income model on a large sample of firms from using analysts' earnings forecasts. The authors evidenced that a simple valuation model which capitalizes analysts' short-term earnings forecasts as a perpetuity provides greater explanatory power for current stock prices than does the residual income model.[31] Dechow et al. do not claim that the superiority of earnings capitalization approach to other valuation models, but only that this simple benchmark model outperforms the residual income model in explaining current stock prices.[32]

Vincent et al. quote a study of Francis et al. where the results of the dividend discount, discounted cash flow, and residual income models are compared using security analysts' earnings forecasts to results using statistical models for forecasting earnings – forecasts that are based on past earnings patterns. It is stated that the authors have found that the residual income model with statistical forecasts dominates the discounted cash flow model and dividend discount model, explaining about 70 percent of the variation in observed stock prices during 1976- 1997. "Analysts' forecasts are significantly less biased but no more accurate than mechanical forecasts in this study and analysts' forecasts do not explain more of the variation in prices than do mechanical forecasts."[33]

[30] Francis, Jennifer; Olsson, Per; Oswald, Dennis R.; "Comparing the Accuracy and Explainability of Dividend, Free Cash Flow, and Abnormal Earnings Equity Value Estimates", **Journal of Accounting Research**, 2000, Vol. 38 Issue 1, p. 68-69

[31] Dechow, Patricia M.; Hutton, Amy P.; Sloan, Richard G.; "An Empirical Assessment of the Residual Income Valuation Model", **Journal of Accounting and Economics**, 1999, Vol. 26 Issue 1-3, p. 1-34

[32] AAA Financial Accounting Standards Committee, op.cit. p. 167

[33] Ibid. p. 166

Most of the studies conducted within the area of research use large samples of firms and provide an average result across firms and/or through time.[34] One of the researches that examine the accuracy of any of the three models at the firm level is the one by Kaplan and Ruback where the authors compare the accuracy of the discounted cash flow model to the method of multiples in valuing 51 highly leveraged transactions during 1983-1989 and find that the discounted cash flow valuations based on management forecasts of cash flows are within 10 percent of the realized transaction value and superior to the multiples approach.[35]

These academic studies mentioned above and many others that require referring indicate the superiority of the residual income model in explaining the stock prices and stock returns to other valuation models such as dividend discount model or discounted cash flow models. However, the academic studies do not claim that any model is generally superior. Although many studies do claim that the RIM does a better job than other valuation models, the sample firms have multiyear security analysts' forecasts of both earnings and dividends, which is not representative of all firms. In addition, the academic studies described above use current stock price as the benchmark for assessing the explanatory power of the valuation models that means they assume that stock prices reflect intrinsic value.[36]

---

[34] Ibid. p. 167

[35] Kaplan, Steven N.; Ruback, Richard S.; "The Valuation of Cash Flow Forecasts: An Empirical Analysis", **Journal of Finance**, 1995, Vol. 50 No. 4, p.1060-1076

[36] AAA Financial Accounting Standards Committee, op. cit. p.167

3. VALUATION TECHNIQUES

The dividend discount model is considered the basis of most valuation models where the value of a business depends on the present value of expected future cash flows discounted by the cost of equity. As the research evolves in time the usefulness of the model is questioned in that dividend policy is arbitrary and the timing and amount of dividends are difficult to foresee.[37] Thus, alternative approaches have been developed some of which made adjustments on the discounted cash flow components, and some of which suggesting majorly different methods. The methods that are used commonly today can be classified into four groups: discounted cash flow valuation, relative valuation, contingent claim valuation and accounting based valuation. The methods under each class will be examined shortly in this section.

3.1 DISCOUNTED CASH FLOW VALUATION TECHNIQUES

In discounted cash flow valuation the value of an asset is determined by discounting the expected future cash flows to that asset at an appropriate discount rate that reflects the riskiness involved in these cash flows. It is based on the assumption that the reason behind the purchase of an asset is the expectation of collecting cash inflows in the future. Under the scope of this technique there are a number of models. One of the models adjust for the discount rate according to the riskiness of cash flows, the other one adjusts for the cash flows to reach risk-adjusted cash flows and discount them at the risk free rate, the third one considers the effects of borrowing money on the value of the business after the valuation has been done without taking the effects of debt into account and the last one values a business based on the excess returns on its investments[38].

While valuing a business one may choose to value the entire firm by discounting the free cash flows to firm (before debt payments and after reinvestment needs) with the cost of capital as the discount rate or to value only the equity stake at the business by discounting the free cash flows to equity (after debt payments and reinvestment needs) with the cost of equity.

The value of equity can also be reached by subtracting the value of non-equity stake

[37] Jenkins, David S.; Kane, Gregory D.; "A Contextual Analysis of Income and Asset Based Approaches to Private Equity Valuation, **Accounting Horizon**, 2006, Vol. 20 No. 1, p.21-22

[38] Damodaran, "Valuation Approaches and Metrics", op. cit. p.699

from the value of the entire business. Either way the value of a business is calculated using the following basic formula:

$$Value\ of\ Business = \sum_{t=1}^{t=\infty} \frac{CF_t}{(1+r)^t} \qquad (1)$$

where CF_t = Cash flow in period t

r = Appropriate discount rate reflecting the riskiness of the cash flows

Discounted cash flow valuation has two basic ways: equity valuation and firm valuation. In order to value only the equity stake in a business the cash flows to equity are discounted back on an appropriate rate that is the cost of equity. According to the equity discounted cash flow valuation:

$$Equity\ Value = \sum_{t=1}^{t=\infty} \frac{\text{CF to Equity}_t}{(1+k_e)^t} \qquad (2)$$

where CF to Equity_t = Expected cash flow to equity in period t

k_e = Cost of equity

In the other way the value of the firm is determined by discounting the cash flows to firm; that is the cash flows left after meeting all of the operating expenses and taxes but before meeting the debt payments; at the appropriate rate which is the weighted average cost of the components of financing the firm, i.e. the weighted average cost of capital (WACC). In that case[39]:

$$Firm\ Value = \sum_{t=1}^{\infty} \frac{\text{CF to Firm}_t}{(1+\text{WACC})^t} \qquad (3)$$

where CF to Firm_t = Expected cash flow to firm in period t

WACC = Weighted average cost of capital

One group of discounted cash flow valuation techniques adjust the discount rates according to the riskiness of the cash flows, these models may be referred to as discount rate adjustment models. Of these methods the one that uses the cash flow to equity approach is dividend discount model.

[39] Damodaran, **Investment Valuation**, op. cit. p.13

One of the oldest and the most widely used DCF model, the dividend discount model, which value the equity stake in a business directly, use dividends as the sole cash flow to equity. It is known that the reason why investors buy stocks is that they expect dividend payments and a capital gain on that investment. Since the selling price that creates the capital gain is also determined by the future dividend payments, the value per share of a stock is the discounted future expected dividends of a company. The basic formula then can be restated as follows:

$$Value\ of\ Equity = \sum_{t=1}^{\infty} \frac{D_t}{(1+k_e)^t} \qquad (4)$$

where D_t = Expected dividends in period t

k_e = Cost of equity

To reach the inputs of the model; expected dividends and the cost of equity; one has to make forecasts on expected future earnings and payout ratios for expected dividends and determine the discount rate. The discount rate is determined by the riskiness of the cash flows and the risk can be measured by various models such as the Capital Asset Pricing Model (CAPM), arbitrage pricing and multi factor models. To find the expected dividends one has to make an assumption on future growth. The simplest assumption is the steady perpetual growth of a firm. The model was popularized by Gordon, Myron J. and named after the author as the Gordon's growth model. Assuming a steady state implies within itself that the growth rate is not only for dividends paid but also for the earnings and the payout ratio, since if earnings do not grow at the same rate, dividends exceed earnings and if the payout ratio does not change dividends converge to zero. Also, it has an insight that the growth rate of the company may not exceed the growth rate of the economy in which the company operates. The formula for the Gordon's growth model is:[40]

$$Value = \frac{D_0(1+g)}{(k_e - g)} \qquad (5)$$

where D_0 = Dividend paid during the last 12 months

[40] Gordon, Myron J.; Shapiro, Eli; "Capital Equipment Analysis: The Required Rate of Profit", **Management Science**, 1956, Vol. 3 No. 1, p.104-106

k_e = Cost of equity

g = Expected growth rate

Before focusing on the determination of the discount rate in detail, it may be useful to mention about the growth rate. The growth rate is the rate of earnings retained in the business for future growth multiplied by the rate of return on equity[41]:

$$g = bk_e \tag{6}$$

where b = Retention ratio ($b = \frac{Earnings - Dividends}{Earnings}$) and,

k_e = Cost of equity

As mentioned previously the steady growth is the simplest assumption in forecasting the future cash flows. The first extension of the model is a two stage growth model which allows for an initial phase where growth is not stable and a subsequent steady state where the growth rate is stable. Again using the Gordon growth model the formula for a two stage dividend discount model would be[42]:

$$Value = \sum_{t=1}^{n} \frac{E(D_t)}{(1 + k_e)^t} + \frac{P_n}{(1 + k_e)^n} \tag{7}$$

where $P_n = \frac{E(D_{n+1})}{(k_e - g)}$

$E(D_t)$ = Expected dividend at time t

k_e = Cost of Equity

g = Expected growth rate

The discounted cash flow methods are widely used by appraisers, security analysts, economists, companies and courts since the models permit understanding value from a very important perspective, which is the possibility and the amount of receiving future benefits.[43] The applicability of the method is flourished when the cash flows are currently positive and

[41] Ryan, Bob; **Corporate Finance and Valuation**, London: Thomson Learning, 2007, p.378

[42] Damodaran, "Valuation Approaches and Metrics", op. cit. p.704

can be estimated reliably into future periods however, there are some situations where discounted cash flow valuation techniques may not work and need to be adjusted. According to Damodaran discounted cash flow valuation techniques are not useful for[44]:

- Firms in trouble, since those firms might have negative earnings and cash flows and expect to lose money for some more time and discounting these cash flows would yield a negative value for equity or the firm.
- Cyclical firms, since the earnings and cash flows of cyclical firms are inclined to follow the economic fluctuations, cyclical firms look like troubled firms in times of recessions and it is an onerous task to forecast the timing and the strength of the economic rise that will follow to find out the forecasted earnings of the cyclical firm.
- Firms with unutilized assets, the value of those assets will not be reflected in the value.
- Firms with patents or product options, these assets may not produce any current cash flows but this does not mean that they don't have a value. Using an alternative valuation technique, values of these assets should be added to the value obtained by discounted cash flow valuation.
- Firms in the process of restructuring, these firms might be undergoing significant changes in asset, capital and ownership structure which might in turn blur the expected cash flows from and the riskiness of the firm, this makes the valuation more problematic.
- Firms involved in acquisitions, as in the case of firms in the process of restructuring these firms might also be in significant changing process and also the acquisition might create a synergy that should be taken into account.
- Private firms, the measurement of risk is the problematic issue in valuing these companies since risk parameters are obtained from historical prices but since the securities of these firms are not traded the data are not present. The problem might be overcome by taking the comparable firms riskiness or relating riskiness to some accounting variables.

It does not mean that the discounted cash flow valuation is not possible to use for such situation, but it means that the models might be adjusted and the process may be cumbersome.

[43] Thomas, Rawley; Schostag, Randy; "Discounted Cash Flow Method: Using New Modeling to Test Reasonableness", **Valuation Strategies**, 2006, Vol. 10 Issue 1, p. 24-41

[44] Damodaran, **Investment Valuation**, op. cit. p.16-18

3.2 RELATIVE VALUATION

Relative valuation bases the value of an asset on the market value of similar assets. In relative valuation the idea is to find a similar asset in the market, depending on the price of that asset finding the value of the asset that is to be valued. The price of the similar asset is standardized through the usage of a common variable in order to make it possible to comparable with the corresponding variable of the company to be valued. That common variable is usually a ratio depending on earnings, cash flows, book value or revenues; such as the price/earnings ratio, price/book value ratio or price/sales ratio.[45] Unlike the discounted cash flow valuation relative valuation is not a quest for intrinsic value; rather it relies on the market to find the right value of an asset. If the market prices the assets correctly then the two models will yield similar results but if there is bias in the market's pricing then the two will diverge. No matter how similar the assets will be there will always be some difference between the comparable firms. In order to control for these differences there are a several ways, which are subjective adjustments, modified multiples, and some statistical techniques (sector regressions, market regressions etc.).[46] Market based valuation is relatively easy since it doesn't require multiyear forecasts[47] and quickly implied. When there are a plenty of comparable firms available and the market pricing is correct it gives reliable results however, it is also open to manipulation since it is easy to choose the comparable firms on a basis that supports the views of the persons valuing the firm. Apart from this subjectivity there is also another peril that affects the reliability of the valuation which is the possibility that the market is mispricing the firms that are comparable to the firm in question. Discounted cash flow valuation might be considered superior in those perspectives in that, the models under DCF are clearer in their assumptions and base valuation on more firm-specific data and are not influenced as much by the market errors as relative valuation does.[48]

3.3 CONTINGENT CLAIM VALUATION

[45] Damodaran, **Investment Valuation**, op. cit. p.18-21

[46] Damodaran, "Valuation Approaches and Metrics", op. cit. p.762-769

[47] Palepu, et. al. op. cit. p.7-1

[48] Daves, Philip R.; Ehrhardt, Michael C.; Shrieves, Ronal E.; **Corporate Valuation: A Guide for Managers and Investors**, Ohio: South-Western, 2004, p. 61-63

Contingent claim valuation has its roots in option pricing. An option is an asset that pays off only if a certain event occurs in the future, that is it is contingent upon the occurrence of a certain event. Any asset that has a similar characteristic may be priced using the option pricing models, such as the Black-Scholes option pricing model and the Binomial option pricing model. According to this method, equity can also be viewed as a call option on the value of the firm where the face value of debt represents the strike price and the terms of debt measures the life of the option.[49] The applicability of the method has some limitations when the long term options are on assets that are not traded, since when the asset is not traded the value of them cannot be obtained from the market that means they have to be estimated and this leads to higher estimation errors when the options are long term.

3.4 ACCOUNTING BASED VALUATION

Accounting based valuation relies on the notion that a business can be valued by individually valuing the assets that make into that business. In other words, the whole value of the business may be obtained by summing up the values of the individual assets that are owned by the business. The accounting based valuation has two aspects: book value based valuation and liquidation valuation. One of the methods under book value based valuation is the book value itself, which relies on the ideal that the balance sheet of a firm represents the reliable estimations of the values of the assets and equity in that firm.[50] In order to reach that aim accounting standard setters have put great effort on the issue of value and came up with some conclusions on how to value assets.

In that perspective fair value accounting has gained significant importance in the last years. Gaining universal acceptance fair value accounting was in the agendas of many accounting standard setting boards. Helping investors in making economic decisions is one of the major goals of financial reporting and many of the most important economic decisions are based on assessing the value of businesses in which to invest. As Barth points out and quotes: "The Financial Accounting Standards Board (FASB) recognizes this motivation for financial reporting by noting in Statement of Financial Accounting Concepts No. 1, paragraph 34, "financial reporting should provide information that is useful to present and potential investors, and creditors, and other users in making rational investment, credit, and similar

[49] Damodaran, **Investment Valuation**, op. cit. p.17

[50] Damodaran, "Valuation Approaches and Metrics", op. cit. p.748-752

decisions."[51] Although fair value accounting is hoped to provide more realistic information about the values of businesses there are others who do not believe that fair value accounting conveys valuable information, and claim that it only provides delayed information.

The book value is considered a reasonable representation of the real value of a business when the business is mature with nearly no growth opportunity and fixed assets are extensive. Another method under book value based valuation, takes book value together with expected future earnings into account. Actually this method is the one that was mentioned above in the context of equity based valuation models and will be further examined throughout the paper. Another type of asset based valuation is the liquidation valuation where it is assumed that all of the assets assumed to be sold at the valuation day. The difference between the discounted cash flow valuations of the individual assets and their liquidation values is caused by the fact that liquidating the assets involves urgency and that urgency injects a discount on the values of the assets the size of the discount depending on the characteristics of the assets, the demand for them and the general state of the economy. Liquidation valuation might be useful for distressed firms, where going concern assumption is in jeopardy and for healthy firms the liquidation valuation will result in undervalued estimates.[52]

[51] Barth, Mary E.; Beaver, William H.; Hand, John R. M.; Landsman, Wayne R.; "Accruals, Accounting-Based Valuation Models, and the Prediction of Equity Values", **Journal of Accounting, Auditing & Finance**, 2005, Vol. 20 Issue 4, p. 312

[52] Damodaran, "Valuation Approaches and Metrics", op. cit. p.748-752

4. EXCESS RETURN MODELS

Excess return models, as they are named in general, are variants of the approach in which discounted cash flow models are included. Under these excess return models any return earned above the required rate of return, i.e. cost of capital, is considered as excess returns. The basis for the rationale behind these models is found in the net present value rule. In order to have a positive net present value an investment has to generate excess returns, and these returns on equity which are higher than the cost of equity are considered as the basis for the value of a firm. One of the most widely used excess return models is the economic value added (EVA) model. The model computes the value of a firm as an output of two components, which are excess returns made and the capital invested in, related to an investment. Two of the variants of the economic value added model is the economic profit and cash flow return on investment models. Economic profit model defines excess return as the net operating profit after tax after being charged for the equity invested by subtracting a capital charge calculated as the capital invested multiplied by the weighted average cost of capital.[53] The method applied in the implementation section of this study is a variant of the economic profit model. Cash flow return on investment models differ in two aspects; firstly the return is calculated as cash flows not accounting earnings and secondly the cost of capital is calculated in real terms rather than nominal terms.[54]

The works of Ohlson, and Feltham and Ohlson are considered as the pioneers of the earnings based excess return models. In his study Ohlson says that statement of changes in stockholders' equity bears an important function which equals changes in book value to earnings minus dividends.[55] This equation is called a clean surplus relation. The reasoning behind this is the fact that all changes in assets and liabilities must have an effect on the income statement and the author is driven by the question that if there is a way to tie the value of the firm into clean surplus relation and identify a role for earnings, book value and dividends in that model. The model developed in the paper by Ohlson indicates relevance of

[53] Daves, et.al. op. cit. p.21

[54] Damodaran, "Valuation Approaches and Metrics", op. cit. p.735

[55] Ohlson, op. cit. p.661

abnormal – residual – earnings in the valuation of a firm's value. It uses the following basic formula to calculate abnormal earnings:[56]

$$Abnormal\ Earnings_t\ (or\ Residual\ Income) = Net\ Income_t - Cost\ of\ Equity_t \times Book\ Value\ of\ Equity_{t-1} \quad (8)$$

The book value of equity of one period can be calculated depending on the clean surplus relationship that is the fact that the book value changes depending on the earnings and dividends of a period. To state this relationship in a formula[57]:

$$Book\ Value\ of\ Equity_t = Book\ Value\ of\ Equity_{t-1} + Net\ Income_t - Dividends_t \quad (9)$$

Consequently, the value of equity is stated as a function of the excess returns on equity that the firm will generate in the future and the book value of equity, in the Ohlson's residual income model[58]:

$$Value\ of\ Equity_0 = Book\ Value\ of\ Equity_0 + \sum_{t=1}^{t=\infty} \frac{(Net\ Income_t - Cost\ of\ Equity_t \times Book\ Value\ of\ Equity_{t-1})}{(1 + Cost\ of\ Equity)^t} \quad (10)$$

The formula states that the value of equity equals the sum of the current book value of equity and expected excess returns to equity in perpetuity discounted at the appropriate discount rate, which is the cost of equity.[59]

The difference of the model from the others that belong to the income approach is that the model discounts accounting earnings and discounts them back to add to the book value of equity. That is, the model takes not only the cash flows but also the difference between cash

[56] Lee, Charles M. C.; "Accounting Based Valuation: Impact on Business Practices and Research", **Accounting Horizons**, 1999, Vol. 13 No. 4, p. 416

[57] Feltham, Gerald A.; Ohlson, James A.; "Valuation and Clean Surplus Accounting for Operating and Financial Activities", **Contemporary Accounting Research**, 1995, Vol.11 No.2 p. 694

[58] Ohlson, op. cit. p.667

[59] Damodaran, "Valuation Approaches and Metrics", op. cit. p.748

flows and accounting earnings, i.e. accruals, into account. Accrual accounting is based on the premise that earnings are a superior indicator of future earnings, dividends and cash flows as compared to current or past cash flows. Thus, if equity value reflects future earnings then accruals should be priced in equity valuation.[60]

The excess return models are of a hybrid approach where both asset-based and income-based approaches meet. Both the income and accounting based approaches to valuation have relative strengths as well as some limitations. For example, the income approach allows for specific and direct estimation of future benefits to the owners, which is consistent with the theory of value. However, if the estimation of future benefits is directly based on historical income, then the precision of the estimate will depend heavily on the persistence embodied in the historical income measure and on the growth assumptions incorporated into the model. In addition, if the discount rate utilized is inappropriate value estimates will be unfavourably affected. Accounting based valuation approaches can be effective in that the accurate identification of individual asset and liability values will yield a reliable value estimate. Moreover, unlike the income approach, an equity discount rate is not required for an asset-based approach. On the other hand, when a significant amount of unrealized intangible assets exists it is often difficult to accurately restate book value to current value.[61]

As stated by Jenkins hybrid approaches such as the residual income model may be considered a better equity valuation model:

"Implicit in comparing and evaluating the two approaches is the idea that each is partly a function of the particular context in which a company is being valued. A valuation model that simultaneously utilizes the relative strengths of each approach may be more effective. Utilizing a hybrid approach provides for a more comprehensive analysis of value based on earnings and asset data considered collectively. More broadly, research reveals that hybrid models are superior in valuation accuracy to single- variable models in general as well as in other economic contexts, such as when a company has significant intangible value. In the final analysis, the effectiveness of hybrid models is derived from their ability to

[60] Barth, Mary E.; Beaver, William H.; Hand, John R. M.; Landsman, Wayne R.; "Accruals, Cash Flows and Equity Values", **Review of Accounting Studies**, 1999, Vol. 4 Issue 3/4, p.205

[61] Jenkins, David S.; "The Benefits of Hybrid Valuation Models", **The CPA Journal**, 2006, p.49

simultaneously capture the multiple dimensions of valuation information contained in income and asset data."[62]

The figure below also illustrates the comparison of valuation results by different approaches to valuation.

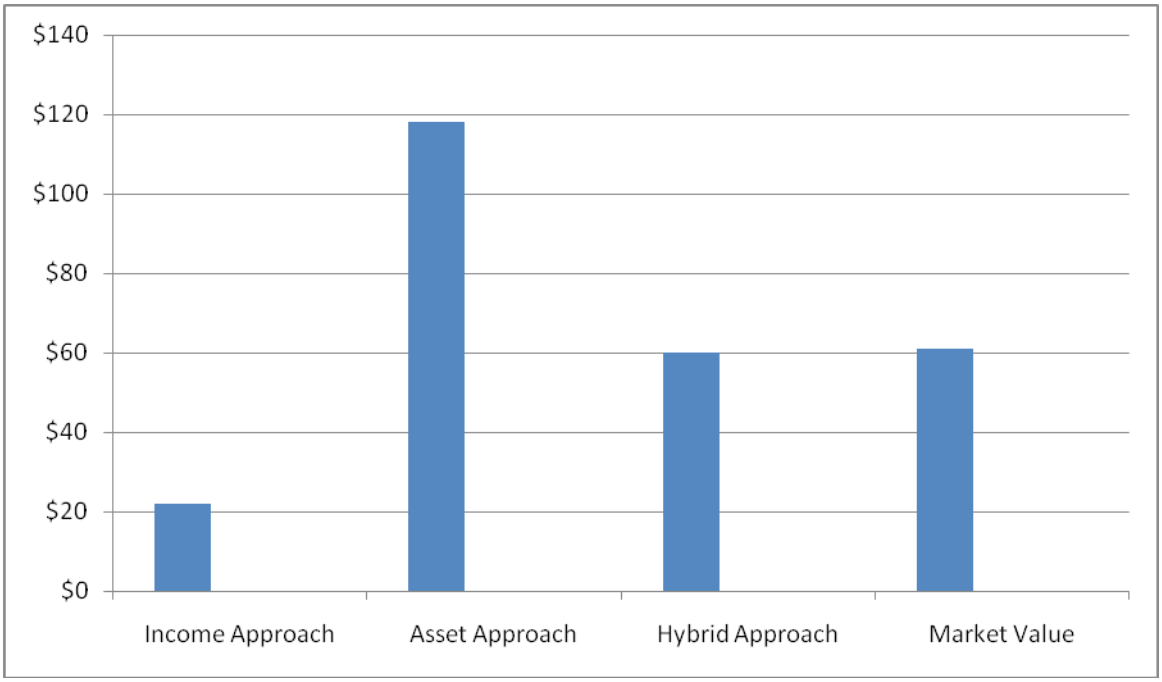

Figure 1: Comparison of Value Estimates to Actual Value (in million U.S. Dollars)
Source: Jenkins, David S.; The Benefits of Hybrid Valuation Models, **The CPA Journal**, 2006 pg 50.

Hybrid approaches provide more comprehensive analysis of value and have superior valuation accuracy compared to single variable approaches. According to Jenkins, "the effectiveness of hybrid models is derived from their ability to simultaneously capture the multiple dimensions of valuation information contained in income and asset data."[63]

Many of the studies in the literature strive to find out the superiority of different methods by trying to find the percentage of variance in the market prices explained by the components of the models, such as cash flows or earnings. This study tries to contribute by applying the insights of the abnormal earnings methodology to individual firms to test its

[62] Ibid. p.49

[63] Ibid. p.50

applicability and compares them to market values, assuming that the market values are the closest to the intrinsic value of a company.

5. EMPRICAL STUDY ON ABNORMAL EARNINGS METHOD – APPLICATION ON FIVE FIRMS LISTED IN THE ISTANBUL STOCK EXHANGE

As part of the studies in this paper, an application of the abnormal earnings method is conducted on five firms listed on the Istanbul Stock Exchange (ISE), in order to illustrate the applicability of the method and to compare the results obtained from the method to market values and values obtained from the Gordon's growth model where applicable.

5.1 METHODOLOGY AND DATA

The equation for the abnormal earnings valuation model requires estimates of future earnings. In that context abnormal earnings are usually forecasted into a four to five years period. Although forecasting is a crucial part of the model many of the text books don't provide a detailed guideline on how to obtain these forecasts but rather give examples that indicate the outcomes of their forecasts that are done by analyzing earnings and considering all available information. Most of the companies used as examples in the text books are hypothetical companies of which characteristics assumed needs a lot of relaxation. For these companies most of the text books take the forecasts as assumptions. On the other hand, where they use proforma income statements to predict future earnings they refer to detailed insider information such as product demand, corporate investment strategies and such factors. Another approach to making earnings forecasts is the use of sophisticated statistical tools. Research indicates that financial analysts' short term forecasts of periods of one quarter to one year are superior to the forecasts of statistically based time series models. However, this is not the case for longer forecasting horizons. There is evidence that analysts' forecasts are losing their superiority when the forecasting horizon increases.[64] It may be caused by the fact that has been stated in a study where it is claimed that the analysts' forecast do not incorporate the time series properties of earnings when setting their expectations.[65] In the presence of these factors such as the need for long term forecasting in abnormal earnings valuation, the unavailability of long term point forecasts by analysts and the bias involved in analysts'

[64] Imhoff, Eugene; Pare, Paul V.; "Analysis and Comparison of Earnings Forecast Agents", **Journal of Accounting Research**, 1982, Vol.20 Issue 2, p.429-439

[65] Ali, Ashiq; Klein, April; Rosenfeld, James; "Analysts' Use of Information about Permanent and Transitory Earnings Components in Forecasting Annual EPS", **Accounting Review**, 1992, Vol. 67 Issue 1, p. 184

forecasts illustrate the importance of statistical techniques and highlight the need for them. Thus, there are a number of studies in the literature which test the predictive ability of forecasting models; however it is also claimed that generating long term, more accurate forecasts discussion has not gained the sufficient attention it desires.[66] For example, there might have been a development in the field such as creating multivariate earnings prediction models that are going to outperform the univariate autoregressive integrated moving average (ARIMA) models. For the point reached by the current research it may be claimed that the most suitable method for long term earnings forecasting is the ARIMA models, and quarterly ARIMA models form the core of earnings forecasting literature.[67] According to Lorek, the outcome of the forecasting is more accurate when quarterly data is used in the model. In his study he states that the forecasts derived from quarterly models are significantly more accurate than forecasts derived by annual models.[68]

The empirical study of the paper deals with the calculation of the equity value of five publicly owned firms, listed on the Istanbul Stock Exchange. In line with the residual income model the quarterly earnings data of the firms are gathered from the database of ISE. The quarterly earnings data is corrected for inflation. The index used in inflation adjustment is prepared in quarterly numbers, an index for a quarter being the arithmetic average of the three months' index numbers that make up the underlying quarter. After making the inflation adjustment, the future earnings are forecasted using the Box-Jenkins methodology for Autoregressive Integrated Moving Average models.

Using the autoregressive model of order one, point forecasts are made for the twelve quarters following the fourth quarter of the year 2008. The formula to calculate the point forecasts, that is the basic form of an ARIMA (1,0,0) or AR(1) is as follows:

$$Y_t = c + \emptyset_1 Y_{t-1} + e_t \qquad (11)$$

[66] Lorek, Kenneth S.; Willinger G. Lee; "The Earnings Forecasting Conundrum", **Management Accounting Quarterly**, 2003, Vol.5 No.1, p.65

[67] Ibid. p.65

[68] Lorek, Kenneth S.; "Predicting Annual Net Net Earnings with Quarterly Earnings Time-Series Models", **Journal of Accounting Research**, 1979, Vol.17 No.1, p.201-202

where, Y_t depends on Y_{t-1} and the value of the autoregressive coefficient, whose value is restricted to lie between -1 and +1.[69]

The forecast for the last year is used in finding the terminal value. It is calculated by first compounding the last years' earnings forecast into future with a growth rate which is equal to the expected growth rate of the gross domestic product (GDP) of Turkey, and secondly it is discounted back to the valuation day by the appropriate discount rate which is the cost of equity in this case. Since it cannot be expected from the firm at the long term to grow at a higher rate than the economy the growth rate of the GDP is selected as the long term growth rate of the firm. The growth rate used in the calculation of the terminal value is the expected GDP growth of Turkey since it would be unwise to expect the company grow higher than the economy in which it operates. The expected GDP growth of Turkey is expected to be 3%. The GDP growth expectation is based on the report of the Central Bank of the Republic of Turkey, where GDP growth estimation for the following year is near 3%.[70]

The discount period in the calculation of the present value of the terminal value is the same as the end of the discrete projection period that is the same number of years as the last projected earnings.[71] The forecasted earnings are adjusted with a capital charge, which is calculated as the last years' book value of equity multiplied by the cost of equity. The following years' book value of equity is calculated using the following formula, depending on the clean surplus relationship[72]:

$$Book\,Value\,of\,Equity_{t+1} = Book\,Value\,of\,Equity_t + E(e_t) - E(Dividends_t) \quad (12)$$

where $E(e_t)$ = the forecasted earnings for the period t and,

$E(Dividends_t)$ = the expected dividends for the period t.

---

[69] Makridakis, Spyros; Wheelwright, Steven C.; Hyndman, Rob J.; **Forecasting Methods and Applications**, New York: John Wiley and Sons, Inc. 1998, p.337

[70] TCMB report Survey of Expectations, April 22, 2009, www.tcmb.gov.tr, p.22

[71] Pratt, Shannon P.; Reilly, Robert F.; Schweihs, Robert P.; **The Analysis and Appraisal of Closely Held Companies**, USA: Mc-Graw Hill Companies, 2000, p.218-219

[72] Feltham et. al. op. cit. p.694

Expected dividends are calculated using the dividend growth rate for each firm, which is computed as the retention ratio multiplied by the cost of equity for each firm. The cost of equity is calculated using the Capital Asset Pricing Model (CAPM), where;

$$k_e = r_f + \beta(r_m - r_f) \quad (13)$$

where k_e = Cost of equity

r_f = Risk free rate of return

β = Beta of the company

r_m = Market rate of return

Risk free rate is taken as the rate of the government bonds with a maturity of 366 days, although it may also be suggested that in countries like Turkey the average interest rate on deposit of the major banks may serve as a better risk free rate, since it may be, and is in many cases, lower than the rate on government bonds with maturities of one year.[73] Market rate of return is obtained from the ISE for each of the sectors that the underlying companies operate in. Lastly, stock betas are calculated as the covariance of the monthly stock returns with the monthly market returns divided by the variance of the monthly market portfolio return over the last ten year period.

Adding the present value of the terminal value to the present values of the forecasted earnings after adjusted for a capital charge and the book value of equity at the valuation date gives the value of the equity of the company.

5.2 APPLICATION ON ISE FIRMS

The results and the comparison of these values to the market values of the companies are in the following sections.

5.2.1 Valuation of Tofaş

[73] Perek, A. Atilla; "Estimation of Discount Rate for Intangible Assets According To IFRS Terms – II", Mali Çözüm Dergisi / Financial Analysis, 2008, Issue 85, p. 61

Tofaş is an automobile manufacturer established in 1968 by Koç Group and today owned fifty percent by Koç Holding and fifty percent by Fiat S.p.A. The company is one of the three strategic production centres of Fiat Auto, and it is the only company in Turkey that exports automobiles to the world. During the last year, Tofaş has been successful in buffering the effects of the global financial crisis through the precautions it has applied and reached a record production level of 268,000 units and a sales level of 277,843 vehicles. Together with the investments made during the year 2008 the production capacity of the company have reached 400,000 units. Despite the economic contraction in the South European countries, which are the main export markets for Tofaş, the export levels were also at a record level of 210,000 units. The domestic market share of Tofaş is 12.4% in the year 2008.

For the valuation of Tofaş its quarterly earnings data is gathered from the financial statements submitted to the Istanbul Stock Exchange and they are adjusted for inflation. The inflation adjusted quarterly earnings data since the earliest available period from the ISE database is illustrated in the graph below:

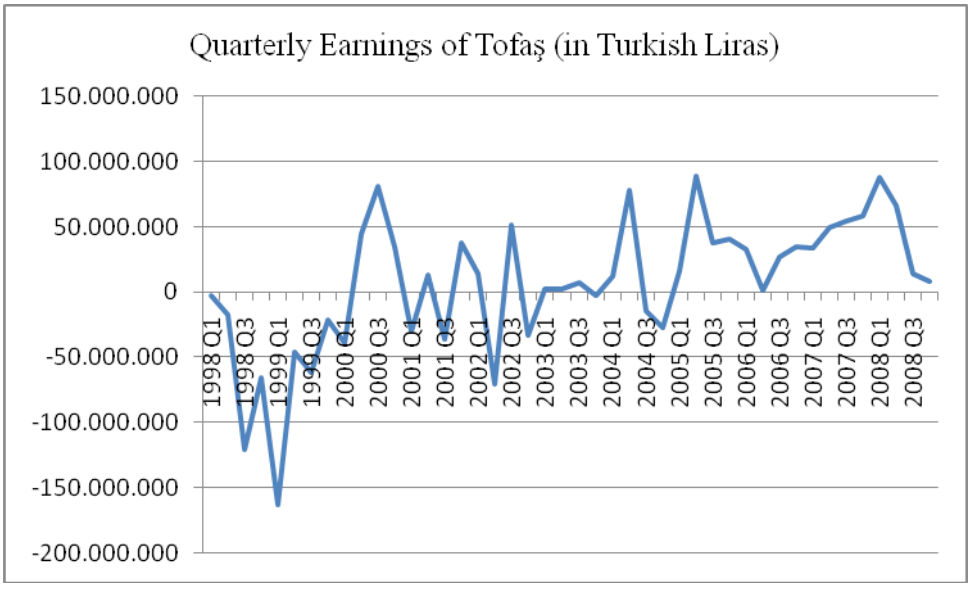

Figure 2: Graphical Representation of the Quarterly Earnings of Tofaş

After examining the graphical presentation of the quarterly earnings data, it is subjected to a unit root test to see if the data is stationary. Augmented Dickey-Fuller test was applied and the test resulted in rejecting the null hypothesis. So, the data is stationary according to the test. Test results can be found at Appendix 1. The autocorrelation and partial auto correlation functions are examined to find out the model that would fit to the data. From

the autocorrelation and partial autocorrelation functions ARIMA (1,0,0) model was identified. Running the model on the data yielded the lowest Akaike information criterion and Schwarz criterion compared to the other possible models that could be identified. The formula used for forecasting the next three years' earnings is as follows:

$$Y_t = 6586780 + \ 0{,}474 \times Y_{t-1} + \ e_t$$

The quarterly earnings data and point forecasts for the following twelve quarters are as follows:

Table 5.2.1.1 Quarterly Earnings Amounts of Tofaş for the period between 1998 and 2011

Period	Earnings (TL)	Period	Earnings (TL)	Period	Earnings (TL)	Period	Earnings (TL)
1998 Q1	-3.027.819,06	2002 Q1	14.450.714,55	2006 Q1	32.252.707,17	E(10 Q1)	12.429.453,37
1998 Q2	-17.577.436,03	2002 Q2	-69.948.471,70	2006 Q2	1.838.078,72	E(10 Q2)	12.483.175,96
1998 Q3	-120.270.741,50	2002 Q3	51.698.170,29	2006 Q3	27.149.729,84	E(10 Q3)	12.508.661,36
1998 Q4	-65.394.498,70	2002 Q4	-33.262.918,97	2006 Q4	35.134.368,12	E(10 Q4)	12.520.751,35
1999 Q1	-162.354.972,63	2003 Q1	2.677.229,32	2007 Q1	33.243.904,73	E(11 Q1)	12.526.486,71
1999 Q2	-45.320.784,00	2003 Q2	2.444.811,88	2007 Q2	49.066.951,94	E(11 Q2)	12.529.207,51
1999 Q3	-61.334.671,12	2003 Q3	7.413.785,28	2007 Q3	53.935.989,06	E(11 Q3)	12.530.498,22
1999 Q4	-21.451.186,08	2003 Q4	-2.583.416,50	2007 Q4	58.031.603,84	E(11 Q4)	12.531.110,52
2000 Q1	-38.735.512,25	2004 Q1	12.222.729,42	2008 Q1	88.007.650,85		
2000 Q2	44.409.365,18	2004 Q2	77.629.515,43	2008 Q2	65.884.599,17		
2000 Q3	80.978.064,99	2004 Q3	-13.876.617,88	2008 Q3	13.901.903,66		
2000 Q4	35.144.433,08	2004 Q4	-27.434.276,09	2008 Q4	8.277.448,57		
2001 Q1	-30.229.448,96	2005 Q1	16.090.763,21	E(09 Q1)*	10.513.510,55		
2001 Q2	12.798.549,42	2005 Q2	88.609.378,29	E(09 Q2)	11.574.273,76		
2001 Q3	-35.796.959,39	2005 Q3	37.502.339,37	E(09 Q3)	12.077.488,15		
2001 Q4	37.465.244,10	2005 Q4	40.543.344,57	E(09 Q4)	12.316.207,53		

* The amounts of earnings for the periods between the first quarter of 2009 and the last quarter of 2011 are forecasted amounts.

The forecasted amounts for the periods of quarters of a following year are added up to find the yearly earning amount.

Table 5.2.1.2 Forecasted Annual Earnings Amounts for the Following Three Year Period

Year	Forecasted Annual Earnings (TL)
2009	46.481.479,98
2010	49.942.042,04
2011	50.117.302,96

After making point forecasts for a period, the terminal value is calculated for a point in time where afterwards the company is assumed to be in steady growth. The growth rate is expected to be 3% as stated before. The formula used in terminal value calculation, which is a basic perpetuity calculation, is as follows:

$$TV = \frac{E(Abnormal\ Earnings_{t+3}) \times (1+g)}{(k_e - g)} \qquad (14)$$

Where E(Abnormal Earnings$_{t+3}$) = Expected abnormal earnings of the third year of the forecasting period

g = Expected growth rate

k_e = Cost of equity

Cost of Equity for Tofaş is calculated using the Capital Asset Pricing Model. The risk free rate is the one-year government bond interest rate, which is 14% and the market return is the average return calculated for the manufacturing industry by the ISE, which is 27.26%. Beta is calculated as the covariance of the stock returns with the market returns divided by the variance of the market portfolio return.[74] The period for beta calculation is the period starting from the beginning of the earnings data gathered for the forecasting procedure until the end of it, i.e. Dec. 31st, 2008. Beta is calculated as 1,15 for Tofaş. Consequently cost of equity for the company is:

$$k_e = 0{,}14 + 1{,}15(0{,}2726 - 0{,}14) = 0{,}29$$

To calculate the capital charge that is to be charged on the expected earnings for the following three year period is calculated as the estimated book value for the related period

[74] Naik, Ranjit; **Financial Modeling for Corporate Finance**, London: Euromoney, 2002, p.36-38

multiplied by the cost of equity. The book value one period ahead is calculated relying on the clean surplus relationship; that is, the book value is changed only by the earnings and dividends (net of capital contributions). Estimated book values and capital charges are as follows:

Table 5.2.1.3 Calculation of the Capital Charges of Tofaş for the Following Three Year Period

All of the Amounts are in TL	Book Value of Prior Period	Net Income (Forecasted)	Dividends	Book Value of the Period (Expected)	Capital Charge (Book Value of the Prior Period x Cost of Capital)
2009	1.119.461.000,00	46.481.479,98	44.280.000,00	1.121.662.479,98	324.117.543,33
2010	1.121.662.479,98	49.942.042,04	54.464.400,00	1.117.140.122,03	324.754.937,83
2011	1.117.140.122,03				323.445.579,53

Thus, the terminal value and the point estimates of abnormal earnings of Tofaş included in the valuation formula, their present values discounted at the cost of equity and the value of the company are as follows:

Table 5.2.1.4 Calculation of the Value of Equity for Tofaş as of Dec. 31st, 2008

All of the amounts are in TL	Amount	Capital Charge (Book Value of Prior Period x Cost of Equity Capital)	Abnormal Earnings (Earnings – Capital Charge)	Present Values (as of Dec. 31st, 2008)
2009 expected earnings	46.481.479,98	324.117.543,33	-277.636.063,35	-215.221.754,53
2010 expected earnings	49.942.042,04	324.754.937,83	-274.812.895,79	-165.142.056,24
2011 expected earnings	50.117.302,96	323.445.579,53	-273.328.276,57	-127.325.512,25
Terminal value	198.901.175,38			71.825.475,26
Total Present Value of Abnormal Earnings and Terminal Value				-435.863.847,76
Book Value of Equity as of Dec. 31st, 2008				1.119.461.000,00
Value of Equity as of Dec. 31st, 2008				683.597.152,24

To compare the results of the method with market value and a different model is also applied. The mostly used valuation model in practice is the Gordon's Growth Model. Dividends distributed in the year 2008 at the amount of 36,000,000.00 TL. The growth rate is calculated using equation 6, and found to be 23%. Replacing these numbers in equation 5, the value according to Gordon's growth model is found and represented in Table 5.2.1.6.

The comparison of the value obtained by the abnormal earnings method with market value shows that the company is undervalued by the market according to its market price as of Dec.31st, 2008. However, the two are closer in value to each other when they are compared to

the Gordon's Growth Model. Assuming the markets provide the value that is closest to the intrinsic value the abnormal earnings method provides a better estimation of value than the dividend discount model.

Table 5.2.1.5 Comparison of the Value of Equity Obtained from the Model for Tofaş

Method	Value as of Dec. 31st, 2008 (TL)
Abnormal Earnings Method	683.597.152,24
Dividend Discount Model (Gordon's Growth Model)	743.826.642,03
Market Value	575,000,000.00

5.2.2 Valuation of Kent

Another company subject to valuation in this study is Kent Gıda, which is also a manufacturing company like Tofaş. Kent Gıda is the largest Turkish confectionery company today and it was initiated by a family in 1920s. In 1956, the company was moved to İstanbul and re-established in the name of Kent Gıda, in so far as to give a pace to its development and to be able to reach all over Turkey. In 1960s the company produced candy and chewing gum, adding to its line of products chocolate as late as 1980s. At the beginning of the year 2000 Kent gathered the three of its factories which were in separate places into one, state of the art factory. The products of Kent were exported to more than a hundred countries at that time. At the beginning of the 21st century the company went into a search for international opportunities and in 2001, it entered into a joint-venture with a Spanish lolly pop manufacturer Chupa Chups. In 2002, the company signed a partnership agreement with Cadbury Schweppes where Cadbury Schweppes acquired 51% equity interest in Kent. Today, Kent is the leading confectionery company in its domestic market and is willing to be a world player in the near future.

For the valuation of Kent its quarterly earnings data is gathered from the financial statements submitted to the Istanbul Stock Exchange and they are adjusted for inflation. The inflation adjusted quarterly earnings data since the earliest available period from the ISE database is illustrated in the graph below:

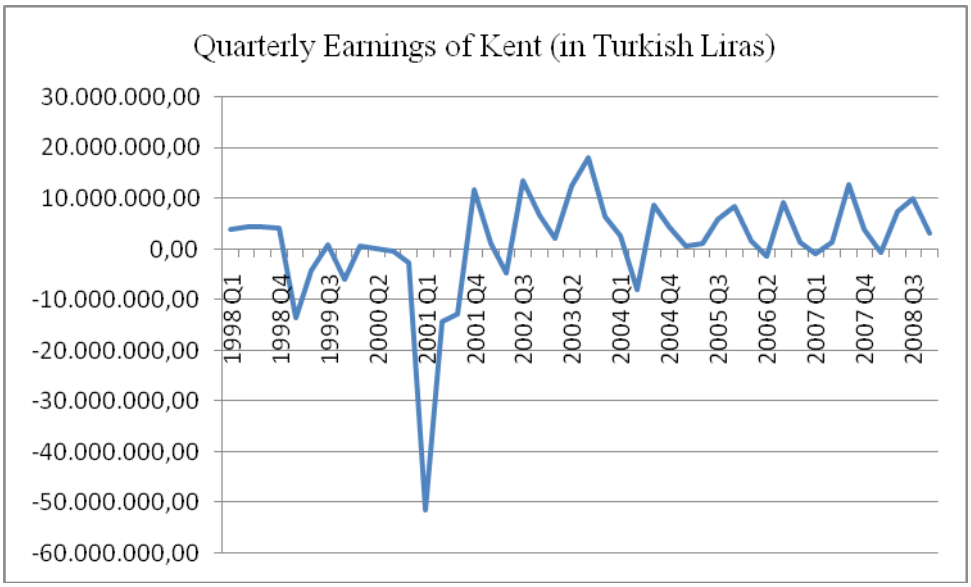

Figure 3: Graphical Representation of the Quarterly Earnings of Kent

After examining the graphical presentation of the quarterly earnings data, it is subjected to a unit root test to see if the data is stationary. Augmented Dickey-Fuller test was applied and the test resulted in rejecting the null hypothesis. So, the data is stationary according to the test. Test results can be found at Appendix 2. The autocorrelation and partial auto correlation functions are examined to find out the model that would fit to the data. From the autocorrelation and partial autocorrelation functions ARIMA (1,0,0) model was identified. Running the model on the data yielded the lowest Akaike information criterion and Schwarz criterion compared to the other possible models that could be identified. The formula used for forecasting the next three years' earnings is as follows:

$$Y_{t+1} = 1189283 + 0{,}309129 \times Y_t + e_t$$

The quarterly earnings data and point forecasts for the following twelve quarters are as follows:

Table 5.2.2.1 Quarterly Earnings Amounts of Kent for the period between 1998 and 2011

Period	Earnings (TL)	Period	Earnings (TL)	Period	Earnings (TL)	Period	Earnings (TL)
1998 Q1	3.915.429,49	2002 Q1	1.070.951,84	2006 Q1	1.792.571,78	E(10 Q1)	1.725.848,00
1998 Q2	4.412.466,53	2002 Q2	-4.651.258,90	2006 Q2	-1.253.893,78	E(10 Q2)	1.722.792,67
1998 Q3	4.516.511,07	2002 Q3	13.652.116,63	2006 Q3	9.335.307,89	E(10 Q3)	1.721.848,17
1998 Q4	4.203.910,83	2002 Q4	6.765.387,36	2006 Q4	1.401.888,95	E(10 Q4)	1.721.556,20
1999 Q1	-13.536.470,20	2003 Q1	2.143.478,18	2007 Q1	-831.408,49	E(11 Q1)	1.721.465,95
1999 Q2	-4.150.112,91	2003 Q2	12.540.985,62	2007 Q2	1.472.858,65	E(11 Q2)	1.721.438,05
1999 Q3	969.474,81	2003 Q3	18.116.168,94	2007 Q3	12.909.827,32	E(11 Q3)	1.721.429,42
1999 Q4	-6.001.609,23	2003 Q4	6.478.598,22	2007 Q4	3.913.387,10	E(11 Q4)	1.721.426,76
2000 Q1	675.111,83	2004 Q1	2.689.012,12	2008 Q1	-579.242,49		
2000 Q2	268.531,98	2004 Q2	-7.899.104,11	2008 Q2	7.561.462,73		
2000 Q3	-469.119,23	2004 Q3	8.668.970,84	2008 Q3	10.000.668,20		
2000 Q4	-2.533.587,50	2004 Q4	4.511.018,85	2008 Q4	3.288.044,42		
2001 Q1	-51.465.242,34	2005 Q1	762.632,11	E(09 Q1)*	2.205.712,88		
2001 Q2	-14.354.158,53	2005 Q2	1.212.482,09	E(09 Q2)	1.871.132,82		
2001 Q3	-12.641.955,78	2005 Q3	5.862.995,81	E(09 Q3)	1.767.704,42		
2001 Q4	11.803.564,63	2005 Q4	8.506.036,49	E(09 Q4)	1.735.731,70		

* The amounts of earnings for the periods between the first quarter of 2009 and the last quarter of 2011 are forecasted amounts.

The forecasted amounts for the periods of quarters of a following year are added up to find the yearly earning amount.

Table 5.2.2.2 Forecasted Annual Earnings Amounts for the Following Three Year Period

Year	Forecasted Annual Earnings (TL)
2009	7.580.281,82
2010	6.892.045,05
2011	6.885.760,17

The terminal value is calculated for a point in time where afterwards the company is assumed to be in steady growth. The expected GDP growth of Turkey is expected to be 3%. The terminal value is calculated using equation 14, which is a basic perpetuity calculation.

Cost of Equity for Kent is calculated using the Capital Asset Pricing Model. The risk free rate is the one-year government bond interest rate, which is 14% and the market return is the average return calculated for the manufacturing industry by the ISE, which is 27.26%. Beta is calculated as the covariance of the stock returns with the market returns divided by the variance of the market portfolio return. The period for beta calculation is the period starting from the beginning of the earnings data gathered for the forecasting procedure until the end of it, i.e. Dec. 31st, 2008. Beta is calculated as 0,62 for Kent. Consequently cost of equity for the company is:

$$k_e = 0{,}14 + 0{,}62(0{,}2726 - 0{,}14) = 0{,}22$$

To calculate the capital charge that is to be charged on the expected earnings for the following three year period is calculated as the estimated book value for the related period multiplied by the cost of equity. The book value one period ahead is calculated relying on the clean surplus relationship; that is, the book value is changed only by the earnings and dividends (net of capital contributions). Estimated book values and capital charges are as follows:

Table 5.2.2.3 Calculation of the Capital Charges of Kent for the Following Three Year Period

All of	Book Value of	Net Income	Dividends	Book Value of	Capital Charge

the Amounts are in TL	Prior Period	(Forecasted)		the period (Expected)	(Book Value of the Prior Period x Cost of Capital)
2009	220.131.668,00	7.580.281,82	4.993.472,08	222.718.477,74	48.899.168,20
2010	222.718.477,74	6.892.045,05	5.892.297,05	223.718.225,74	49.473.791,77
2011	223.718.225,74				49.695.871,79

Thus, the terminal value and the point estimates of abnormal earnings of Kent included in the valuation formula, their present values discounted at the cost of equity and the value of the company are as follows:

Table 5.2.2.4 Calculation of the Value of Equity for Kent as of Dec. 31st, 2008

All of the Amounts are in TL	Amount	Capital Charge (Book Value of Prior Period x Cost of Equity Capital)	Abnormal Earnings (Earnings – Capital Charge)	Present Values (as of Dec. 31st, 2008)
2009 expected earnings	7.580.281,82	48.899.168,20	-41.318.886,38	-33.867.940
2010 expected earnings	6.892.045,05	49.473.791,77	-42.581.746,72	-28.609.075
2011 expected earnings	6.885.760,17	49.695.871,79	-42.810.111,62	-23.575.823
Terminal value	45.017.181,77			20.320.715
Total Present Value of Abnormal Earnings and Terminal Value				-65.732.123
Book Value of Equity as of Dec. 31st, 2008				220.131.668
Value of Equity as of Dec. 31st, 2008				154.399.545

To compare the results of the method with market value and a different model is also applied. The mostly used valuation model in practice is the Gordon's Growth Model. Dividends distributed in the year 2008 at the amount of 4.231.756 TL. The growth rate is calculated as 18%.

The comparison of the value obtained by the abnormal earnings method with market value shows that the company is drastically overvalued by the market according to its market price as of Dec.31st, 2008. Dividend discount model also approves the finding that the market overvalues the company; however, this may be an indication of the need to incorporate information other then the simple discounting of future earnings or cash flows.

Table 5.2.2.5 Comparison of the Value of Equity Obtained from the Model for Kent

Method	Value as of Dec. 31st, 2008 (TL)
Abnormal Earnings Method	154.399.545,00
Dividend Discount Model (Gordon's Growth Model)	118.508.450,73
Market Value	698.510.575,50

5.2.3 Valuation of Garanti

Established in 1946 in Ankara, Garanti Bank is the second largest private bank in Turkey today, with its large asset size and the high capacity to generate continuous banking revenues. Total assets of Garanti have reached $65 billion as of the year 2008. Having a customer centric approach and an innovative culture, Garanti generated an ordinary banking income growth of 22% and increased its customer base by over one million. Taking the difficulties undergone in the last year into account its success is underscored once again as a bank. The bank serves over 8 million customers in various segments such as corporate, commercial, SME, and consumer segments giving all sorts of financial services, namely; payment systems, pension, leasing, factoring, brokerage and asset management. Garanti has 730 branches of which five are foreign branches and four are international representative offices, it has approximately 2.600 Automatic Telling Machines (ATMs) and also an efficient use of internet and mobile banking technology. Garanti is Turkey's largest lender providing more than $44 billion in cash and non-cash loans. Among Garanti's main distinguishing factors is its sound asset quality through advanced risk management systems, established risk culture, and strong collection capability. Garanti Bank is owned jointly by Doğuş Holding and GE Capital and 49% of equity interest is traded in the ISE.

For the valuation of Garanti its quarterly earnings data is gathered from the financial statements submitted to the Istanbul Stock Exchange and they are adjusted for inflation. The inflation adjusted quarterly earnings data since the earliest available period from the ISE database is illustrated in the graph below:

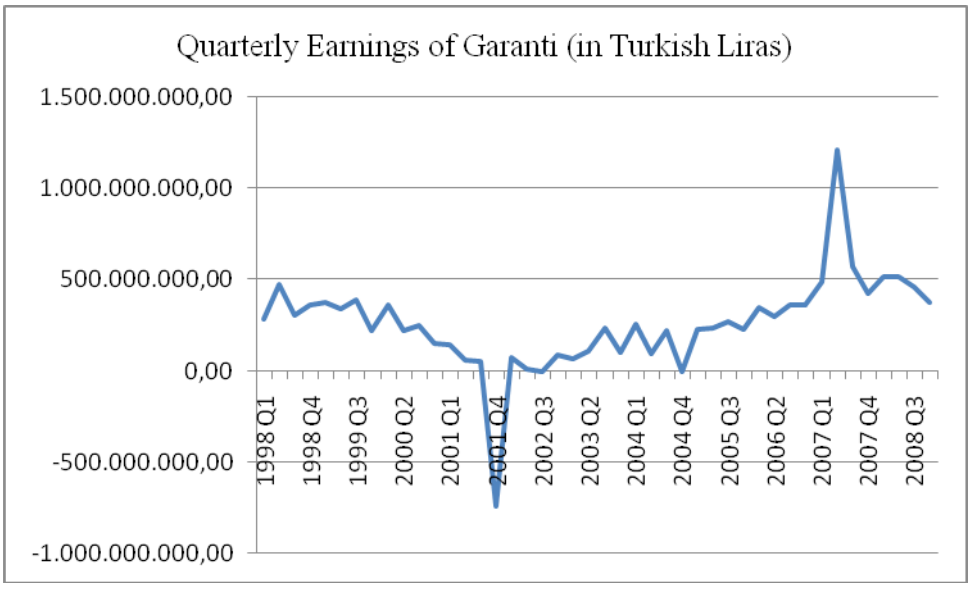

Figure 4: Graphical Representation of the Quarterly Earnings of Garanti

After examining the graphical presentation of the quarterly earnings data, it is subjected to a unit root test to see if the data is stationary. Augmented Dickey-Fuller test was applied and the test resulted in rejecting the null hypothesis. So, the data is stationary according to the test. Test results can be found at Appendix 3. The autocorrelation and partial auto correlation functions are examined to find out the model that would fit to the data. From the autocorrelation and partial autocorrelation functions ARIMA (1,0,0) model was identified. Running the model on the data yielded the lowest Akaike information criterion and Schwarz criterion compared to the other possible models that could be identified. The formula used for forecasting the next three years' earnings is as follows:

$$Y_{t+1} = 259000000 + 0{,}536793 \times Y_t + e_t$$

The quarterly earnings data and point forecasts for the following twelve quarters are as follows:

Table 5.2.3.1 Quarterly Earnings Amounts of Garanti for the period between 1998 and 2011

Period	Earnings (TL)	Period	Earnings (TL)	Period	Earnings (TL)	Period	Earnings (TL)
1998 Q1	284.962.621	2002 Q1	74.517.626	2006 Q1	350.986.181	E(10 Q1)	550.831.313
1998 Q2	470.910.668	2002 Q2	12.184.943	2006 Q2	299.536.325	E(10 Q2)	554.682.393
1998 Q3	307.694.348	2002 Q3	-4.435.207	2006 Q3	362.881.876	E(10 Q3)	556.749.626
1998 Q4	360.800.747	2002 Q4	88.983.722	2006 Q4	360.168.430	E(10 Q4)	557.859.302
1999 Q1	375.092.074	2003 Q1	70.530.872	2007 Q1	487.260.596	E(11 Q1)	558.454.968
1999 Q2	337.277.113	2003 Q2	107.692.936	2007 Q2	1.209.488.737	E(11 Q2)	558.774.718
1999 Q3	389.940.910	2003 Q3	236.256.466	2007 Q3	569.722.427	E(11 Q3)	558.946.357
1999 Q4	223.570.571	2003 Q4	102.086.248	2007 Q4	421.465.615	E(11 Q4)	559.038.492
2000 Q1	361.790.681	2004 Q1	253.507.006	2008 Q1	517.512.892		
2000 Q2	224.224.871	2004 Q2	97.276.371	2008 Q2	512.994.473		
2000 Q3	250.588.298	2004 Q3	220.835.614	2008 Q3	459.347.969		
2000 Q4	153.083.655	2004 Q4	454.321	2008 Q4	372.604.736		
2001 Q1	146.136.576	2005 Q1	231.186.741	E(09 Q1)*	459.011.614		
2001 Q2	57.230.641	2005 Q2	236.498.631	E(09 Q2)	505.394.221		
2001 Q3	52.901.801	2005 Q3	273.388.020	E(09 Q3)	530.292.080		
2001 Q4	-738.603.820	2005 Q4	230.600.323	E(09 Q4)	543.657.077		

* The amounts of earnings for the periods between the first quarter of 2009 and the last quarter of 2011 are forecasted amounts.

The forecasted amounts for the periods of quarters of a following year are added up to find the yearly earning amount.

Table 5.2.3.2 Forecasted Annual Earnings Amounts for the Following Three Year Period

Year	Forecasted Annual Earnings (TL)
2009	2.038.354.992,16
2010	2.220.122.633,92
2011	2.235.214.534,94

The terminal value is calculated for a point in time where afterwards the company is assumed to be in steady growth. The expected GDP growth of Turkey is expected to be 3%. The terminal value is calculated using equation 14, which is a basic perpetuity calculation.

Cost of Equity for Garanti is calculated using the Capital Asset Pricing Model. The risk free rate is the one-year government bond interest rate, which is 14% and the market return is the average return calculated for the financial institutions by the ISE, which is 16.18%. Beta is calculated as the covariance of the stock returns with the market returns divided by the variance of the market portfolio return. The period for beta calculation is the period starting from the beginning of the earnings data gathered for the forecasting procedure until the end of it, i.e. Dec. 31st, 2008. Beta is calculated as 1,14 for Garanti. Consequently cost of equity for the company is:

$$k_e = 0{,}14 + 1{,}14(0{,}1618 - 0{,}14) = 0{,}16$$

To calculate the capital charge that is to be charged on the expected earnings for the following three year period is calculated as the estimated book value for the related period multiplied by the cost of equity. The book value one period ahead is calculated relying on the clean surplus relationship; that is, the book value is changed only by the earnings and dividends (net of capital contributions). Estimated book values and capital charges are as follows:

Table 5.2.3.3 Calculation of the Capital Charges of Garanti for the Following Three Year Period

All of the Amounts are in TL	Book Value of Prior Period	Net Income (Forecasted)	Dividends	Book Value of the period (Expected)	Capital Charge (Book Value of the Prior Period x Cost of Capital)
2009	9.742.580.118,01	2.038.354.992,16	0,00	11.780.935.110,17	1.606.356.609,86
2010	11.780.935.110,17	2.220.122.633,92	0,00	14.001.057.744,10	1.942.440.580,97
2011	14.001.057.744,10				2.308.494.400,85

Thus, the terminal value and the point estimates of abnormal earnings of Garanti included in the valuation formula, their present values discounted at the cost of equity and the value of the company are as follows:

Table 5.2.3.4 Calculation of the Value of Equity for Garanti as of Dec. 31st, 2008

All of the amounts are in TL	Amount	Capital Charge (Book Value of Prior Period x Cost of Equity Capital)	Abnormal Earnings (Earnings – Capital Charge)	Present Values (as of Dec. 31st, 2008)
2009 expected earnings	2.038.354.992,16	1.606.356.609,86	431.998.382,30	372.412.398,54
2010 expected earnings	2.220.122.633,92	1.942.440.580,97	277.682.052,96	206.363.000,12
2011 expected earnings	2.235.214.534,94	2.308.494.400,85	-73.279.865,91	-46.947.308,41
Terminal value	17.069.031.516,80			9.427.074.156,17
Total Present Value of Abnormal Earnings and Terminal Value				9.958.902.246,41
Book Value of Equity as of Dec. 31st, 2008				9.742.580.118,01
Value of Equity as of Dec. 31st, 2008				19.701.482.364,42

The comparison of the value obtained by the abnormal earnings method with market value shows that the company is undervalued by the market according to its market price as of Dec.31st, 2008.

Table 5.2.3.5 Comparison of the Value of Equity Obtained from the Model for Garanti

Method	Value as of Dec. 31st, 2008 (TL)
Abnormal Earnings Method	19.701.482.364,42
Market Value	10.920.000.000,00

5.2.4 Valuation of Çelebi

Çelebi Holding is a group of companies which serve customers in a variety of businesses such as ground handling services, security, tourism, personnel transport, vehicle rental, and fast-food. In 1958, the first private ground handling company of Turkey is established in the name of Çelebi Ground Handling Inc. and today it is amongst the largest ground handling companies in Europe. In 1973, Çelebi Tourism is established to serve basic tourism services. In 1974, Çe-Tur Çelebi Turizm Ticaret A.Ş. is established to provide ground transportation services for the flight crews of domestic and foreign airlines and in 1996 it added vehicle rental services to its service lines. In 1995 Çelebi Holding Inc. was established so as to provide centralized coordination among the rapidly-growing companies of the Group while also adding new companies to the Group as opportunities emerged. In 1996, Çelebi Group has also entered into the fast food industry through franchises. In 1997, the Çelebi Group set up Çelebi Güvenlik Sistemleri ve Danışmanlık A.Ş., a private security and surveillance consultancy and agency for aircraft and airports under Turkey's Airport Civil Aviation Regulations. The newest companies under the group's umbrella may be listed as: Çelebi Ground Handling Hungary Ltd., established in 2006; Çelebi-IC Antalya Havalimanı Terminal Yatırım ve İşletme A.Ş., established in 2005; Ortadoğu Antalya Liman İşletmeleri A.Ş., established in 2006; and Çelebi Marina ve Yat İşletmeciliği A.Ş., established in 2007. Today, Çelebi Holding has more than three thousand employees, and it is a Turkish company that looks confidently into the future.

For the valuation of Çelebi its quarterly earnings data is gathered from the financial statements submitted to the Istanbul Stock Exchange and they are adjusted for inflation. The inflation adjusted quarterly earnings data since the earliest available period from the ISE database is illustrated in the graph below:

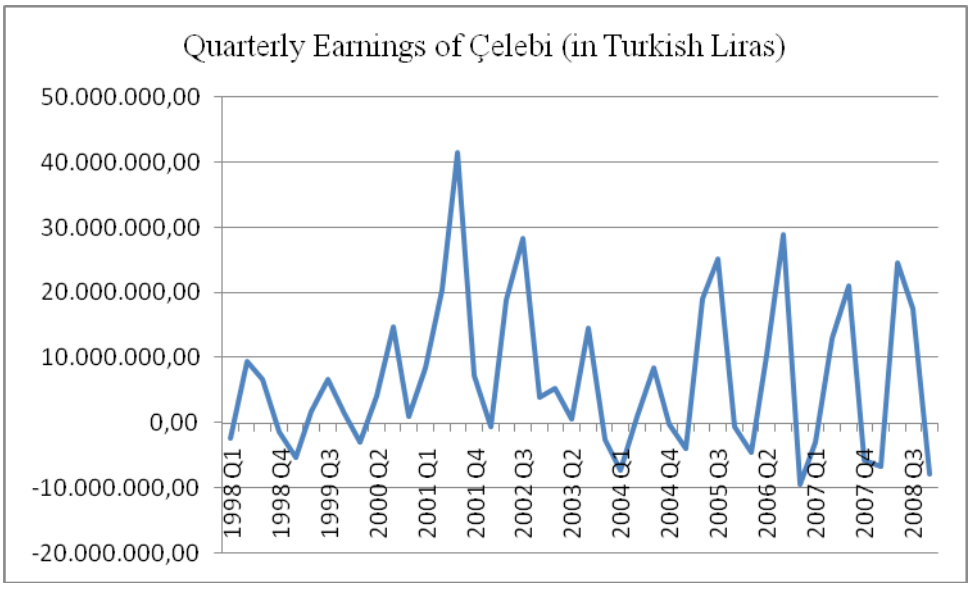

Figure 5: Graphical Representation of the Quarterly Earnings of Çelebi

After examining the graphical presentation of the quarterly earnings data, it is subjected to a unit root test to see if the data is stationary. The test resulted in rejecting the null hypothesis. A second examination of the graphic representation of the data suggested that the data should be subjected to seasonal adjustment to remove seasonality from the data. The seasonally adjusted data obtained from the X11 additive decomposition, which is a part of the Census II family, is again subjected to the Augmented Dickey-Fuller test and the test resulted in rejecting the null hypothesis. So, the seasonally adjusted data is stationary according to the test. Test results can be found at Appendix 4. The autocorrelation and partial auto correlation functions are examined to find out the model that would fit to the data. From the autocorrelation and partial autocorrelation functions ARIMA (1,0,0) model was identified. Running the model on the data yielded the lowest Akaike and Schwarz criteria compared to the other possible models that could be identified. The formula used for forecasting the next three years' earnings is as follows:

$$Y_{t+1} = 6928671 + 0{,}45228 \times Y_t + e_t$$

The quarterly seasonally adjusted earnings data and point forecasts for the following twelve quarters are as follows:

Table 5.2.4.1 Quarterly Earnings Amounts of Çelebi for the period between 1998 and 2011

Period	Seasonally Adjusted Earnings (TL)	Period	Seasonally Adjusted Earnings (TL)	Period	Seasonally Adjusted Earnings (TL)	Period	Seasonally Adjusted Earnings (TL)
1998 Q1	3.620.900,40	2002 Q1	6.570.372,29	2006 Q1	6.291.236,24	E(10 Q1)	12.470.032,00
1998 Q2	6.960.446,16	2002 Q2	16.948.143,56	2006 Q2	4.620.590,48	E(10 Q2)	12.568.617,07
1998 Q3	-961.981,23	2002 Q3	16.865.667,84	2006 Q3	14.700.878,78	E(10 Q3)	12.613.205,13
1998 Q4	2.712.970,11	2002 Q4	10.123.182,34	2006 Q4	-125.117,66	E(10 Q4)	12.633.371,42
1999 Q1	1.103.500,17	2003 Q1	13.467.197,65	2007 Q1	8.584.369,51	E(11 Q1)	12.642.492,22
1999 Q2	-861.017,17	2003 Q2	-1.972.300,97	2007 Q2	6.078.696,13	E(11 Q2)	12.646.617,38
1999 Q3	-1.615.260,25	2003 Q3	2.270.164,74	2007 Q3	6.566.902,19	E(11 Q3)	12.648.483,11
1999 Q4	6.029.253,62	2003 Q4	4.197.674,05	2007 Q4	4.698.736,59	E(11 Q4)	12.649.326,94
2000 Q1	3.488.843,00	2004 Q1	1.735.121,10	2008 Q1	5.058.522,63		
2000 Q2	1.826.048,78	2004 Q2	-2.286.078,97	2008 Q2	17.205.482,05		
2000 Q3	5.410.805,33	2004 Q3	-4.605.320,80	2008 Q3	2.706.171,41		
2000 Q4	6.186.071,74	2004 Q4	7.187.867,04	2008 Q4	3.139.254,53		
2001 Q1	15.319.394,92	2005 Q1	6.076.663,57	E(09 Q1)*	8.348.493,04		
2001 Q2	18.382.629,86	2005 Q2	14.758.369,61	E(09 Q2)	10.704.527,43		
2001 Q3	31.001.741,39	2005 Q3	11.580.864,91	E(09 Q3)	11.770.114,67		
2001 Q4	12.934.052,84	2005 Q4	7.572.248,04	E(09 Q4)	12.252.058,46		

* The amounts of earnings for the periods between the first quarter of 2009 and the last quarter of 2011 are forecasted amounts.

The forecasted amounts for the periods of quarters of a following year are added up to find the yearly earning amount.

Table 5.2.4.2 Forecasted Annual Earnings Amounts for the Following Three Year Period

Year	Forecasted Annual Earnings (TL)
2009	43.075.193,60
2010	50.285.225,62
2011	50.586.919,66

The terminal value is calculated for a point in time where afterwards the company is assumed to be in steady growth. The expected GDP growth of Turkey is expected to be 3%. The terminal value is calculated using equation 14, which is a basic perpetuity calculation.

Cost of Equity for Garanti is calculated using the Capital Asset Pricing Model. The risk free rate is the one-year government bond interest rate, which is 14% and the market return is the average return calculated for the transportation industry by the ISE, which is 21.23%. Beta is calculated as the covariance of the stock returns with the market returns divided by the variance of the market portfolio return. The period for beta calculation is the period starting from the beginning of the earnings data gathered for the forecasting procedure until the end of it, i.e. Dec. 31st, 2008. Beta is calculated as 0.82 for Çelebi. Consequently cost of equity for the company is:

$$k_e = 0{,}14 + 0{,}82(0{,}2123 - 0{,}14) = 0{,}20$$

To calculate the capital charge that is to be charged on the expected earnings for the following three year period is calculated as the estimated book value for the related period multiplied by the cost of equity. The book value one period ahead is calculated relying on the clean surplus relationship; that is, the book value is changed only by the earnings and dividends (net of capital contributions). Estimated book values and capital charges are as follows:

Table 5.2.4.3 Calculation of the Capital Charges of Çelebi for the Following Three Year Period

All of the Amounts are in TL	Book Value of Prior Period	Net Income (Forecasted)	Dividends	Book Value of the period (Expected)	Capital Charge (Book Value of the Prior Period x Cost of Capital)
2009	130.331.380,00	43.075.193,60	38.135.800,50	137.406.377,93	25.968.527,47
2010	137.406.377,93	50.285.225,62	36.000.195,67	153.707.418,84	27.378.220,80
2011	153.707.418,84				30.626.203,20

Thus, the terminal value and the point estimates of abnormal earnings of Çelebi included in the valuation formula, their present values discounted at the cost of equity and the value of the company are as follows:

Table 5.2.4.4 Calculation of the Value of Equity for Çelebi as of Dec. 31st, 2008

All of the amounts are in TL	Amount	Capital Charge (Book Value of Prior Period x Cost of Equity Capital)	Abnormal Earnings (Earnings – Capital Charge)	Present Values (as of Dec. 31st, 2008)
2009 expected earnings	43.075.193,60	25.968.527,47	17.106.666,14	14.255.555,11
2010 expected earnings	50.285.225,62	27.378.220,80	22.907.004,82	15.907.642,23
2011 expected earnings	50.586.919,66	30.626.203,20	19.960.716,46	11.551.340,54
Terminal value	307.855.404,72			148.464.219,09
Total Present Value of Abnormal Earnings and Terminal Value				190.178.756,98
Book Value of Equity as of Dec. 31st, 2008				130.331.380,00
Value of Equity as of Dec. 31st, 2008				320.510.136,98

To compare the results of the method with market value and a different model is also applied. The mostly used valuation model in practice is the Gordon's Growth Model. Dividends distributed in the year 2008 at the amount of 38,135,800.5 TL. The growth rate is calculated as 0.006%.

The comparison of the value obtained by the abnormal earnings method with market value shows that the company is undervalued by the market according to its market price as of Dec.31st, 2008.

Table 5.2.4.5 Comparison of the Value of Equity Obtained from the Model for Çelebi

Method	Value as of Dec. 31st, 2008 (TL)
Abnormal Earnings Method	320.510.136,98
Gordon's Growth Model	198.523.235,72
Market Value	157.950.000,00

5.2.5 Valuation of Kelebek

Kelebek was established in 1935 with the aim of producing airplane wings, but today it is one of the largest furniture manufacturers of Turkey operating in a plant based on 200,000 square meters. Kelebek has increased its exports to various countries in the last years and it has a wide distribution network through its stores in all over Turkey.

For the valuation of Kelebek its quarterly earnings data is gathered from the financial statements submitted to the Istanbul Stock Exchange and they are adjusted for inflation. The inflation adjusted quarterly earnings data since the earliest available period from the ISE database is illustrated in the graph below:

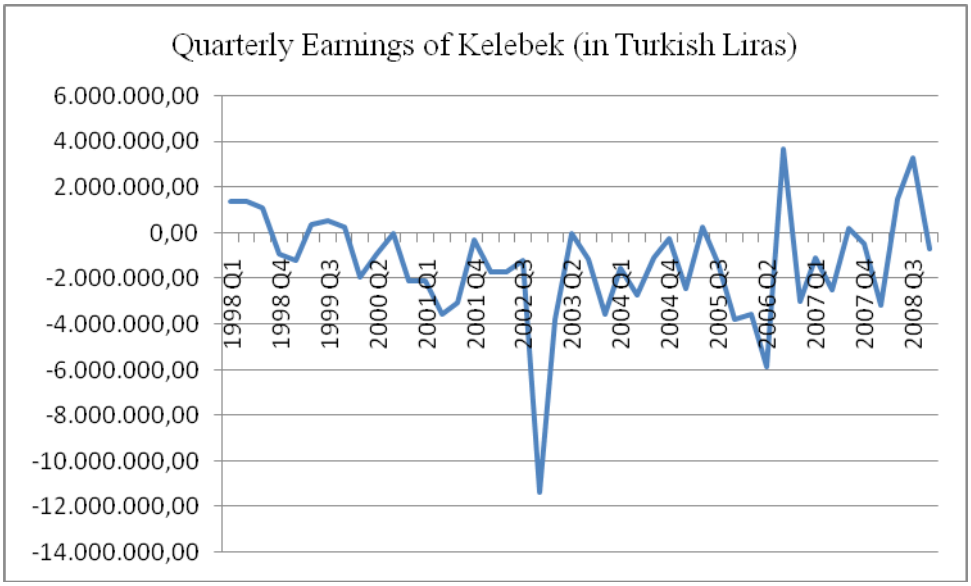

Figure 6: Graphical Representation of the Quarterly Earnings of Kelebek

After examining the graphical presentation of the quarterly earnings data, it is subjected to a unit root test to see if the data is stationary. Augmented Dickey-Fuller test was applied and the test resulted in failing to reject the null hypothesis that the data is stationary. Thus, the first difference of the data was subjected to the same test to find out if the first

difference of the data is stationary and it was found to be so. Test results can be found at Appendix 5. After differencing the data, the autocorrelation and partial auto correlation functions of the differenced series are examined to find out the model that would fit to the data. From the autocorrelation and partial autocorrelation functions ARIMA (1,0,0) model was identified. Running the model on the data yielded the lowest Akaike information criterion and Schwarz criterion compared to the other possible models that could be identified. The formula used for forecasting the next three years' earnings is as follows:

$$(Y_{t+1} - Y_t) = -20343{,}21 + \ -0{,}451752 \times (Y_t - Y_{t-1}) + \ e_t$$

The quarterly seasonally adjusted earnings data and point forecasts for the following twelve quarters are as follows:

Table 5.2.5.1 Quarterly Earnings Amounts of Kelebek for the period between 1998 and 2011

Period	Seasonally Adjusted Earnings (TL)	Period	Seasonally Adjusted Earnings (TL)	Period	Seasonally Adjusted Earnings (TL)	Period	Seasonally Adjusted Earnings (TL)
1998 Q1	1.369.866,76	2002 Q1	-1.740.770,27	2006 Q1	-3.559.197,94	E(10 Q1)	472.811,12
1998 Q2	1.382.297,79	2002 Q2	-1.710.196,30	2006 Q2	-5.864.572,06	E(10 Q2)	425.088,25
1998 Q3	1.068.239,70	2002 Q3	-1.226.937,96	2006 Q3	3.666.400,25	E(10 Q3)	426.303,94
1998 Q4	-910.657,78	2002 Q4	-11.370.722,48	2006 Q4	-3.011.924,92	E(10 Q4)	405.411,54
1999 Q1	-1.189.014,22	2003 Q1	-3.796.802,75	2007 Q1	-1.112.495,48	E(11 Q1)	394.506,52
1999 Q2	366.204,71	2003 Q2	-60.293,04	2007 Q2	-2.511.540,67	E(11 Q2)	379.089,67
1999 Q3	547.553,02	2003 Q3	-1.186.743,08	2007 Q3	200.445,39	E(11 Q3)	365.711,05
1999 Q4	217.323,10	2003 Q4	-3.587.186,03	2007 Q4	-472.896,74	E(11 Q4)	351.411,66
2000 Q1	-1.952.641,94	2004 Q1	-1.576.521,03	2008 Q1	-3.179.471,97		
2000 Q2	-928.768,70	2004 Q2	-2.729.516,54	2008 Q2	1.505.877,66		
2000 Q3	-56.403,97	2004 Q3	-1.107.501,80	2008 Q3	3.265.574,10		
2000 Q4	-2.136.665,98	2004 Q4	-286.017,01	2008 Q4	-714.488,75		
2001 Q1	-2.122.602,98	2005 Q1	-2.455.605,23	E(09 Q1)*	1.063.169,39		
2001 Q2	-3.554.362,19	2005 Q2	253.328,44	E(09 Q2)	239.765,56		
2001 Q3	-3.067.133,80	2005 Q3	-1.329.496,57	E(09 Q3)	591.396,68		
2001 Q4	-334.435,92	2005 Q4	-3.814.353,92	E(09 Q4)	412.203,41		

* The amounts of earnings for the periods between the first quarter of 2009 and the last quarter of 2011 are forecasted amounts.

The forecasted amounts for the periods of quarters of a following year are added up to find the yearly earning amount.

Table 5.2.5.2 Forecasted Annual Earnings Amounts for the Following Three Year Period

Year	Forecasted Annual Earnings (TL)
2009	2.306.535,04
2010	1.729.614,86
2011	1.490.718,91

The terminal value is calculated for a point in time where afterwards the company is assumed to be in steady growth. The expected GDP growth of Turkey is expected to be 3%. The terminal value is calculated using equation 14, which is a basic perpetuity calculation.

Cost of Equity for Kelebek is calculated using the Capital Asset Pricing Model. The risk free rate is the one-year government bond interest rate, which is 14% and the market return is the average return calculated for the manufacturing industry by the ISE, which is 27.26%. Beta is calculated as the covariance of the stock returns with the market returns divided by the variance of the market portfolio return. The period for beta calculation is the period starting from the beginning of the earnings data gathered for the forecasting procedure until the end of it, i.e. Dec. 31st, 2008. Beta is calculated as 0.69 for Kelebek. Consequently cost of equity for the company is:

$$k_e = 0{,}14 + 0{,}69(0{,}2726 - 0{,}14) = 0{,}23$$

To calculate the capital charge that is to be charged on the expected earnings for the following three year period is calculated as the estimated book value for the related period multiplied by the cost of equity. The book value one period ahead is calculated relying on the clean surplus relationship; that is, the book value is changed only by the earnings and dividends (net of capital contributions). Estimated book values and capital charges are as follows:

Table 5.2.5.3 Calculation of the Capital Charges of Kelebek for the Following Three Year Period

All of the Amounts are in TL	Book Value of Prior Period	Net Income (Forecasted)	Dividends	Book Value of the period (Expected)	Capital Charge (Book Value of the Prior Period x Cost of Capital)
2009	16.795.314,00	2.306.535,04	0,00	19.101.849,04	3.886.973,11
2010	19.101.849,04	1.729.614,86	0,00	20.831.463,90	4.420.779,13
2011	20.831.463,90				4.821.067,35

Thus, the terminal value and the point estimates of abnormal earnings of Kelebek included in the valuation formula, their present values discounted at the cost of equity and the value of the company are as follows:

Table 5.2.5.4 Calculation of the Value of Equity for Kelebek as of Dec. 31st, 2008

All of the amounts are in TL	Amount	Capital Charge (Book Value of Prior Period x Cost of Equity Capital)	Abnormal Earnings (Earnings – Capital Charge)	Present Values (as of Dec. 31st, 2008)
2009 expected earnings	2.306.535,04	3.886.973,11	-1.580.438,07	-1.284.909,00
2010 expected earnings	1.729.614,86	4.420.779,13	-2.691.164,27	-1.778.811,73
2011 expected earnings	1.490.718,91	4.821.067,35	-3.330.348,45	-1.789.675,70
Terminal value	7.622.624,37			3.330.305,49
Total Present Value of Abnormal Earnings and Terminal Value				-1.523.090,94
Book Value of Equity as of Dec. 31st, 2008				16.795.314,00
Value of Equity as of Dec. 31st, 2008				15.272.223,06

The comparison of the value obtained by the abnormal earnings method with market value shows that the company is rather slightly overvalued by the market according to its market price as of Dec.31st, 2008.

Table 5.2.5.5 Comparison of the Value of Equity Obtained from the Model for Kelebek

Method	Value as of Dec. 31st, 2008 (TL)
Abnormal Earnings Method	15.272.223,06
Market Value	20.000.000,00

6. CONCLUSIONS

There are a wide range of models available for those who attempt to value a business, which may be pretty diverge from each other in their assumptions in detail but they also have some common characteristics. Therefore these models can be classified into approaches and classes of valuation techniques. Using the income, market or cost approach – or a mixture of them – valuation models are classified into four basic areas, namely; discounted cash flow valuation, relative valuation, contingent claim valuation and accounting based valuation.

The model that was implemented in valuing five of the firms listed in the Istanbul Stock Exchange (ISE) in this study is the abnormal earnings method, which is a hybrid approach of income and cost approaches to valuation. This model is built on book value as well as earnings and might be considered rather useful in a number of aspects. Firstly, companies may fail sometimes to pay out what they can afford in dividends or simply choose not to pay any and also there might be difficulties in estimating cash flows. These reasons may make the application of discounted cash flow valuation burdensome. Moreover, comparable markets or companies might not be present for the application of relative valuation. Besides, as pointed out by Gürbüz, since the market as a whole is an emerging one most of the companies in ISE lack equity capital, and also in an inflationary environment such as the one in Turkey it can be harmful for firms with low equity capital bases to pay cash dividends. Therefore cash dividends are hardly observed in the market.[75] This fact makes the application of dividend discount models less practical for ISE firms.

In addition to the easily referred difficulties of alternative models there are many empirical tests that prove the superiority of abnormal earnings methodology. It is also argued that the discounted cash flow values should be equal to the ones obtained by excess return models when the assumptions about growth and reinvestment however, there is significant evidence in the various studies that excess return models outperform discounted cash flow models.[76] Another point of view that back up the abnormal earnings methodology is that anchoring on what is known is more intensely operationalized in abnormal earnings models. As Penman points out anchoring the first component of the model on book value, which is

[75] Gürbüz, A. Osman; Tantan, Saadet; Yolsal, Handan; "The Effect of Stock Splits on Excess Returns: Evidence from Istanbul Stock Exchange", **EFMA Athens**, 2000, Working Paper Series, http://ssrn.com/abstract=253408

[76] Damodaran, "Valuation Approaches and Metrics", op. cit. p.736, 749

obtained from audited financial statements, makes eminent sense than anchoring on a forecast value.[77]

It was aimed in this study to illustrate the applicability of the abnormal earnings methodology on Turkish companies, and compare the outcomes of the valuation to the market values. Four of the five companies' equity values calculated according to the abnormal earnings method indicate that the market undervalues these companies. This may be caused by the circumstances in which the economy as a whole has found itself, i.e. the economic crisis that is being undergone in the global sense. The economic crisis which started during the first two weeks of October 2008 in the developed economies of the world has also affected Turkey's economy, especially for some industries. Turkey has made fundamental changes regarding the banking sector especially after the banking crisis that occurred in 2001. So, it has been successful in bringing the sector to a stronger position against the crises, due to this progress, the current economic fluctuation that affects the world economies today did not drastically deteriorate the functioning of the banking sector in Turkey. However, many other sectors were not as successful as the banking sector in dealing with the crisis environment. It is also another fact that foreign investors' custody balances have reached 72.4% of the total custody balance in the Istanbul Stock Exchange 100 Index at the end of 2007. [78] Thus, the crisis that affects the foreigners in the ISE has caused them to exit from the market, causing the market prices to decline.

The first company that was subjected to valuation in this study is Tofaş. Tofaş being a company in the automotive manufacturing sector, the year 2008 has not been a bad year. However, the automotive sector in Turkey has its problems. The automotive sector is one of the sectors that are strongly affected by crises and diminishes in demand. Thus, the crisis must have had its effects on Tofaş, too. The diminishing trend in its quarterly earnings for the year 2008 implies this fact. Despite the fact that the earnings have declined as a result of the contraction in the economy and a pretty high discount rate of 29% the value obtained by implementing the abnormal earnings method yielded a higher result than the market value. As in the case for Tofaş, Kelebek which is also a furniture manufacturing company the earnings

[77] Penman, Stephen H.; "Handling Valuation Models", **Journal of Applied Corporate Finance**, 2006, Vol.18 No.2, p. 51

[78] Öker, Figen; Demir, Volkan; Perek, Seda, "The Evolution of Turkey's Accounting and Auditing System on the way Towards the European Union", **Journal of Interdisciplinary Economics**, 2009, Vol. 20 Nos. 3&4, p. 329,330,340

amount for the last quarter of the year 2008 is negative, which drastically affects the forecasting for the future periods. This may be due to the decrease in export transactions. The value obtained by the model and the market value are relatively close to each other, however, the valuation should be conducted at a later time when the effects of the crisis are less significant. Another company, which is also in the manufacturing sector, is Kent. Kent, a confectionery manufacturer, has also observed a decrease in earnings for the last quarter of the year 2008; however, the food and beverage industry is one of the least affected industries from crises. Because the forecasting procedure depends heavily on the last quarters' earnings amount, the model yielded pessimistic forecasts, yet the sector as a whole has its advantages and the market appreciates these advantages. Thus, its market value is much higher than the value obtained from the valuation conducted in this study.

The two other firms, Garanti Bank and Çelebi are part of the financial services and transportation industries, respectively. As mentioned above the banking industry was considered ready for the crises, because of the restructuring it has experienced with new supervisory ad prudential regulations and mergers and acquisitions. Only the strongest banks have survived the crisis in the year 2001. Thus, the earnings of Garanti Bank did not change as much as the other firms' earnings. As a result of the positive earnings pattern of the last quarters', Garanti's value is found to be higher than its market capitalization. This may be caused by the decrease in foreign investments in the market. Çelebi, on the other hand, is a holding company providing services in various markets of the transportation industry. Despite the decrease in its earnings in the last quarter of the year 2008 Çelebi's value according to the abnormal earnings method is higher than its market capitalization. This again may be due to the crisis affecting the demand in the stock exchange market and the prices.

In spite of the fact that the discount rate used in the valuation process is quite high the values of the companies, except for Kent, are higher than their market values. One of the reasons why the discount rate is high is that the risk free rate is high in Turkey. Employment of a more reasonable risk free rate may have increased the values of the companies drastically. In addition to that, the market values may not be realistic in that, the crisis worldwide is also affecting Turkish economy. The study may be conducted at a later time when the markets may be considered in a normal state in terms of stability.

Considering its centrality in making important decisions, valuation is one of the most important topics in finance, yet, it is claimed that while many research has been done into some aspects of valuation (e.g. risk assessment) other aspects (e.g. cash flow estimation) remain to be explored[79]. Further research in valuation should be directed at finding means of valuation that contain components required by the specific characteristics of the businesses to be valued and also incorporate tools to deal with the political and economic risks that are peculiar to emerging markets since in the last years international mergers have gained significant importance and acquisitions occur intensively in emerging economies.

[79] Damodaran, "Valuation Approaches and Metrics", op. cit. p.694

7. APPENDICES

APPENDIX 1: EVIEWS OUTPUTS OF TOFAŞ

Correlogram of Tofaş

Date: 06/01/09 Time: 18:15
Sample: 1998Q1 2008Q4
Included observations: 44

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |**** |	. |**** |	1	0.474	0.474	10.587	0.001
. |*** |	. |** |	2	0.432	0.268	19.596	0.000
. |** |	.*| . |	3	0.232	-0.063	22.245	0.000
. |*. |	. | . |	4	0.155	-0.035	23.459	0.000
. | . |	. | . |	5	0.063	-0.034	23.666	0.000
. | . |	.*| . |	6	-0.027	-0.085	23.704	0.001
.*| . |	. | . |	7	-0.065	-0.037	23.933	0.001
.*| . |	. | . |	8	-0.107	-0.038	24.578	0.002
. | . |	. |*. |	9	-0.005	0.130	24.580	0.003
. | . |	. |*. |	10	0.061	0.129	24.805	0.006
. | . |	.*| . |	11	0.004	-0.110	24.806	0.010
. | . |	.*| . |	12	-0.020	-0.098	24.831	0.016
. | . |	. |*. |	13	0.057	0.123	25.047	0.023
. | . |	. | . |	14	0.031	-0.003	25.111	0.033
. |*. |	. |*. |	15	0.168	0.168	27.079	0.028
. | . |	.*| . |	16	-0.002	-0.164	27.079	0.041
. | . |	. | . |	17	0.017	-0.049	27.101	0.057
. | . |	. | . |	18	-0.007	0.062	27.104	0.077
. | . |	. | . |	19	0.018	0.002	27.130	0.102
. | . |	. | . |	20	0.005	-0.024	27.133	0.132

Unit Root Test of Tofaş

Null Hypothesis: TOASO has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.824883	0.0054
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CORRELTOASO)
Method: Least Squares
Date: 06/01/09 Time: 18:16
Sample (adjusted): 1998Q2 2008Q4
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CORRELTOASO(-1)	-0.525599	0.137416	-3.824883	0.0004
C	3586728.	7230286.	0.496070	0.6225

R-squared	0.262984	Mean dependent var	262913.2
Adjusted R-squared	0.245008	S.D. dependent var	54170012
S.E. of regression	47068472	Akaike info criterion	38.21750
Sum squared resid	9.08E+16	Schwarz criterion	38.29942
Log likelihood	-819.6763	F-statistic	14.62973
Durbin-Watson stat	2.261660	Prob(F-statistic)	0.000438

Model Fit AR(1)

Dependent Variable: TOASO
Method: Least Squares
Date: 06/01/09 Time: 14:03
Sample (adjusted): 1998Q2 2008Q4
Included observations: 43 after adjustments
Convergence achieved after 2 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6586780.	13656357	0.482323	0.6321
AR(1)	0.474389	0.137416	3.452210	0.0013

R-squared	0.225217	Mean dependent var	6586778.
Adjusted R-squared	0.206320	S.D. dependent var	52833452
S.E. of regression	47068645	Akaike info criterion	38.21751
Sum squared resid	9.08E+16	Schwarz criterion	38.29942
Log likelihood	-819.676		
Durbin-Watson stat	4	F-statistic	11.91805
	2.261613	Prob(F-statistic)	0.001303

Inverted AR Roots	.47

Correlogram of Residuals for Tofaş

Date: 06/01/09 Time: 18:28
Sample: 1998Q1 2008Q4
Included observations: 43

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.*| . |	.*| . |	1	-0.133	-0.133	0.8203	0.365
. |** |	. |** |	2	0.245	0.231	3.6465	0.162
. | . |	. |*. |	3	0.022	0.083	3.6691	0.299
. |*. |	. | . |	4	0.066	0.023	3.8880	0.421
. | . |	. | . |	5	0.032	0.018	3.9386	0.558
. | . |	.*| . |	6	-0.052	-0.075	4.0802	0.666
. | . |	. | . |	7	-0.014	-0.051	4.0915	0.769
.*| . |	.*| . |	8	-0.112	-0.103	4.7802	0.781
. | . |	. | . |	9	0.015	0.009	4.7938	0.852
. |*. |	. |*. |	10	0.112	0.192	5.5301	0.853
. | . |	. | . |	11	-0.019	0.040	5.5511	0.902
.*| . |	.*| . |	12	-0.080	-0.159	5.9466	0.919
. |*. |	. | . |	13	0.092	0.047	6.4964	0.926
.*| . |	.*| . |	14	-0.091	-0.059	7.0436	0.933
. |** |	. |** |	15	0.267	0.245	11.955	0.682
.*| . |	. | . |	16	-0.093	0.014	12.578	0.703
. | . |	.*| . |	17	0.008	-0.128	12.583	0.764
. | . |	. | . |	18	-0.014	-0.017	12.598	0.815
. | . |	. | . |	19	0.017	0.013	12.621	0.857
. | . |	. | . |	20	-0.002	-0.048	12.621	0.893

APPENDIX 2: EVIEWS OUTPUTS OF KENT

Correlogram of Kent

Date: 06/01/09 Time: 00:44
Sample: 1998Q1 2008Q4
Included observations: 44

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |** |	. |** |	1	0.305	0.305	4.3861	0.036
. |*. |	. | . |	2	0.137	0.049	5.2932	0.071
. | . |	. | . |	3	0.012	-0.047	5.3008	0.151
. |*. |	. |*. |	4	0.077	0.088	5.6040	0.231
. |*. |	. |*. |	5	0.100	0.067	6.1252	0.294
.*| . |	**| . |	6	-0.117	-0.202	6.8548	0.334
. | . |	. |*. |	7	0.009	0.102	6.8589	0.444
. |*. |	. |*. |	8	0.141	0.175	7.9814	0.435
.*| . |	***| . |	9	-0.145	-0.339	9.2045	0.419
**| . |	.*| . |	10	-0.231	-0.149	12.370	0.261
.*| . |	. |*. |	11	-0.133	0.162	13.451	0.265
. | . |	.*| . |	12	-0.036	-0.104	13.534	0.331
. | . |	. | . |	13	0.043	0.014	13.656	0.399
.*| . |	. | . |	14	-0.150	0.005	15.168	0.367
.*| . |	.*| . |	15	-0.071	-0.098	15.519	0.415
. | . |	.*| . |	16	-0.020	-0.059	15.546	0.485
. | . |	. |*. |	17	-0.046	0.109	15.708	0.545
. | . |	. | . |	18	-0.025	-0.008	15.758	0.609
. | . |	. | . |	19	0.004	-0.050	15.759	0.673
. | . |	. | . |	20	0.022	-0.022	15.801	0.729

Unit Root Test of Kent

Null Hypothesis: KENTCORREL has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.653147	0.0005
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(KENTCORREL)
Method: Least Squares
Date: 06/01/09 Time: 13:50
Sample (adjusted): 1998Q2 2008Q4
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
KENTCORREL(-1)	-0.690871	0.148474	-4.653147	0.0000
C	817132.0	1595976.	0.511995	0.6114

R-squared	0.345589	Mean dependent var	-14590.35
Adjusted R-squared	0.329628	S.D. dependent var	12701696
S.E. of regression	10399672	Akaike info criterion	35.19784
Sum squared resid	4.43E+15	Schwarz criterion	35.27976
Log likelihood	-754.7536	F-statistic	21.65178
Durbin-Watson stat	2.030361	Prob(F-statistic)	0.000034

Model Fit AR(1)

Dependent Variable: KENT
Method: Least Squares
Date: 04/16/09 Time: 16:06
Sample (adjusted): 1998Q2 2008Q4
Included observations: 43 after adjustments
Convergence achieved after 2 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1189283.	2295550.	0.518082	0.6072
AR(1)	0.309129	0.148474	2.082041	0.0436

R-squared	0.095620	Mean dependent var	1189285.
Adjusted R-squared	0.073561	S.D. dependent var	10804667
S.E. of regression	10399673	Akaike info criterion	35.19784
Sum squared resid	4.43E+15	Schwarz criterion	35.27976
Log likelihood	-754.753	F-statistic	4.334902
Durbin-Watson stat	2.030359	Prob(F-statistic)	0.043621

Inverted AR Roots	.31

Correlogram of Residuals for Kent

Date: 06/01/09 Time: 00:45
Sample: 1998Q1 2008Q4
Included observations: 43

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. | . |	. | . |	1	-0.015	-0.015	0.0102	0.919
. | . |	. | . |	2	0.054	0.053	0.1460	0.930
.*| . |	.*| . |	3	-0.061	-0.059	0.3236	0.956
. | . |	. | . |	4	0.063	0.059	0.5181	0.972
. |*. |	. |*. |	5	0.142	0.151	1.5468	0.908
.*| . |	**| . |	6	-0.183	-0.195	3.2907	0.772
. | . |	. | . |	7	0.005	-0.004	3.2922	0.857
. |** |	. |** |	8	0.217	0.275	5.8894	0.660
.*| . |	**| . |	9	-0.141	-0.224	7.0193	0.635
.*| . |	**| . |	10	-0.186	-0.260	9.0545	0.527
.*| . |	. |*. |	11	-0.069	0.127	9.3413	0.590
. | . |	. | . |	12	0.011	-0.054	9.3494	0.673
. |*. |	. | . |	13	0.123	-0.011	10.321	0.668
.*| . |	. | . |	14	-0.169	0.040	12.223	0.588
. | . |	.*| . |	15	-0.039	-0.076	12.327	0.654
. | . |	.*| . |	16	0.008	-0.132	12.332	0.721
. | . |	. |*. |	17	-0.038	0.082	12.441	0.773
. | . |	. | . |	18	-0.027	0.031	12.496	0.821
. | . |	. | . |	19	0.011	-0.033	12.506	0.863
. | . |	. | . |	20	0.013	-0.036	12.521	0.897

APPENDIX 3: EVIEWS OUTPUTS OF GARANTİ

Correlogram of Garanti

Date: 06/01/09 Time: 00:40
Sample: 1998Q1 2008Q4
Included observations: 44

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |**** |	. |**** |	1	0.527	0.527	13.050	0.000
. |**** |	. |** |	2	0.468	0.264	23.610	0.000
. |*** |	. |*. |	3	0.388	0.101	31.053	0.000
. |** |	.*| . |	4	0.250	-0.073	34.208	0.000
. |*. |	. | . |	5	0.185	-0.033	35.988	0.000
. |*. |	. | . |	6	0.126	-0.015	36.827	0.000
. | . |	.*| . |	7	0.036	-0.070	36.900	0.000
. |*. |	. |*. |	8	0.090	0.106	37.356	0.000
. | . |	.*| . |	9	-0.011	-0.085	37.363	0.000
. | . |	. | . |	10	0.036	0.064	37.441	0.000
. | . |	.*| . |	11	-0.026	-0.080	37.484	0.000
. | . |	. |*. |	12	0.031	0.093	37.545	0.000
. | . |	.*| . |	13	-0.029	-0.082	37.601	0.000
.*| . |	.*| . |	14	-0.072	-0.080	37.952	0.001
. | . |	. | . |	15	-0.046	0.029	38.099	0.001
. | . |	. | . |	16	-0.030	0.032	38.162	0.001
. | . |	. | . |	17	-0.050	0.010	38.351	0.002
. | . |	. | . |	18	-0.027	-0.028	38.407	0.003
. | . |	. | . |	19	-0.025	0.039	38.459	0.005
. | . |	. | . |	20	-0.019	-0.043	38.488	0.008

Unit root test of Garanti

Null Hypothesis: GARAN has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.504535	0.0126
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GARAN)
Method: Least Squares
Date: 06/01/09 Time: 13:49
Sample (adjusted): 1998Q2 2008Q4
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GARAN(-1)	-0.463174	0.132164	-3.504535	0.0011
C	1.21E+08	48117828	2.513853	0.0160

R-squared	0.230506	Mean dependent var	2038189.
Adjusted R-squared	0.211738	S.D. dependent var	2.52E+08
S.E. of regression	2.24E+08	Akaike info criterion	41.33495
Sum squared resid	2.05E+18	Schwarz criterion	41.41686
Log likelihood	-886.7013	F-statistic	12.28176
Durbin-Watson stat	2.307302	Prob(F-statistic)	0.001121

Model Fit AR(1)

Dependent Variable: GARAN
Method: Least Squares
Date: 05/01/09 Time: 23:29
Sample (adjusted): 1998Q2 2008Q4
Included observations: 43 after adjustments
Convergence achieved after 2 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.59E+08	73651078	3.513794	0.0011
AR(1)	0.536793	0.132166	4.061508	0.0002

R-squared	0.286918	Mean dependent var	2.59E+08
Adjusted R-squared	0.269526	S.D. dependent var	2.62E+08
S.E. of regression	2.24E+08	Akaike info criterion	41.33497
Sum squared resid	2.05E+18	Schwarz criterion	41.41689
Log likelihood	-886.7019	F-statistic	16.49688
Durbin-Watson stat	2.307157	Prob(F-statistic)	0.000214

Inverted AR Roots	.54

Correlogram of Residuals for Garanti

Date: 06/01/09 Time: 00:41
Sample: 1998Q1 2008Q4
Included observations: 43

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.*| . |	.*| . |	1	-0.163	-0.163	1.2274	0.268
. |*. |	. |*. |	2	0.162	0.139	2.4668	0.291
. |*. |	. |*. |	3	0.142	0.197	3.4458	0.328
. |*. |	. |*. |	4	0.086	0.126	3.8168	0.431
. | . |	. | . |	5	0.056	0.041	3.9769	0.553
. |*. |	. | . |	6	0.086	0.045	4.3639	0.628
.*| . |	.*| . |	7	-0.098	-0.139	4.8817	0.674
. |*. |	. | . |	8	0.146	0.062	6.0628	0.640
.*| . |	.*| . |	9	-0.119	-0.091	6.8662	0.651
. |*. |	. | . |	10	0.092	0.055	7.3586	0.691
.*| . |	.*| . |	11	-0.092	-0.067	7.8683	0.725
. |*. |	. |*. |	12	0.095	0.085	8.4281	0.751
. | . |	. | . |	13	-0.018	0.032	8.4491	0.813
.*| . |	.*| . |	14	-0.076	-0.105	8.8320	0.842
. | . |	. | . |	15	0.011	-0.014	8.8399	0.886
. | . |	. | . |	16	0.019	-0.005	8.8671	0.919
. | . |	. | . |	17	-0.038	0.031	8.9756	0.941
. | . |	. | . |	18	0.011	-0.024	8.9845	0.960
. | . |	. | . |	19	-0.009	0.047	8.9917	0.974
. | . |	. | . |	20	-0.012	-0.033	9.0039	0.983

APPENDIX 4: EVIEWS OUTPUTS OF ÇELEBİ

Correlogram of Çelebi (Seasonally adjusted)

Date: 06/01/09 Time: 00:36
Sample: 1998Q1 2008Q4
Included observations: 44

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |*** |	. |*** |	1	0.442	0.442	9.1917	0.002
. |*** |	. |*. |	2	0.333	0.171	14.527	0.001
. |** |	. | . |	3	0.205	0.010	16.602	0.001
. |*. |	. | . |	4	0.129	-0.007	17.446	0.002
. | . |	. | . |	5	0.063	-0.026	17.649	0.003
.*| . |	.*| . |	6	-0.079	-0.150	17.985	0.006
**| . |	**| . |	7	-0.231	-0.216	20.914	0.004
***| . |	***| . |	8	-0.451	-0.358	32.325	0.000
***| . |	.*| . |	9	-0.385	-0.083	40.891	0.000
**| . |	. |*. |	10	-0.263	0.100	45.011	0.000
**| . |	.*| . |	11	-0.298	-0.084	50.456	0.000
***| . |	.*| . |	12	-0.322	-0.155	57.007	0.000
.*| . |	. |*. |	13	-0.169	0.103	58.870	0.000
.*| . |	. | . |	14	-0.130	-0.041	60.016	0.000
. | . |	.*| . |	15	-0.040	-0.110	60.125	0.000
. | . |	.*| . |	16	0.029	-0.127	60.187	0.000
. | . |	.*| . |	17	0.056	-0.075	60.425	0.000
. | . |	.*| . |	18	0.024	-0.107	60.471	0.000
. | . |	.*| . |	19	0.064	-0.111	60.804	0.000
. | . |	**| . |	20	0.012	-0.282	60.816	0.000

Unit root test of Seasonally Adjusted Çelebi

Null Hypothesis: CELEBISA has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.928184	0.0040
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CELEBISA)
Method: Least Squares
Date: 06/01/09 Time: 13:47
Sample (adjusted): 1998Q2 2008Q4
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CELEBISA(-1)	-0.547719	0.139433	-3.928184	0.0003
C	3789900.	1366380.	2.773678	0.0083

R-squared	0.273444	Mean dependent var	-11201.07
Adjusted R-squared	0.255723	S.D. dependent var	7332645.
S.E. of regression	6325981.	Akaike info criterion	34.20362
Sum squared resid	1.64E+15	Schwarz criterion	34.28554
Log likelihood	-733.3779	F-statistic	15.43063
Durbin-Watson stat	2.124890	Prob(F-statistic)	0.000321

Model fit AR(1)

Dependent Variable: CELEBISA
Method: Least Squares
Date: 04/16/09 Time: 16:12
Sample (adjusted): 1998Q2 2008Q4
Included observations: 43 after adjustments
Convergence achieved after 2 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6928671.	1761295.	3.933849	0.0003
AR(1)	0.452280	0.139433	3.243706	0.0023

R-squared	0.204218	Mean dependent var	6928676.
Adjusted R-squared	0.184809	S.D. dependent var	7006454.
S.E. of regression	6325983.	Akaike info criterion	34.20362
Sum squared resid	1.64E+15	Schwarz criterion	34.28554
Log likelihood	-733.3779	F-statistic	10.52165
Durbin-Watson stat	2.124886	Prob(F-statistic)	0.002349

Inverted AR Roots	.45

Correlogram of Residuals

Date: 06/01/09 Time: 00:35
Sample: 1998Q1 2008Q4
Included observations: 38

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. | . |	. | . |	1	-0.017	-0.017	0.0121	0.912
. | . |	. | . |	2	-0.051	-0.052	0.1232	0.940
. *| . |	. *| . |	3	-0.171	-0.173	1.3893	0.708
. *| . |	. *| . |	4	-0.101	-0.115	1.8465	0.764
. |*. |	. |*. |	5	0.098	0.076	2.2922	0.807
. |*. |	. |*. |	6	0.136	0.107	3.1757	0.786
. *| . |	. *| . |	7	-0.073	-0.096	3.4337	0.842
.**| . |	. *| . |	8	-0.193	-0.184	5.3203	0.723
. *| . |	. *| . |	9	-0.088	-0.057	5.7251	0.767
. |*. |	. |*. |	10	0.178	0.173	7.4409	0.683
. *| . |	.**| . |	11	-0.086	-0.190	7.8600	0.726
. *| . |	.**| . |	12	-0.082	-0.189	8.2569	0.765
. | . |	. | . |	13	-0.033	0.047	8.3244	0.822
. *| . |	. | . |	14	-0.062	0.001	8.5671	0.858
. | . |	. *| . |	15	0.033	-0.113	8.6398	0.896
. | . |	. *| . |	16	0.021	-0.125	8.6717	0.926

APPENDIX 5: EVIEWS OUTPUTS OF KELEBEK

Correlogram of Kelebek (First Difference)

Date: 06/01/09 Time: 13:43
Sample: 1998Q1 2008Q4
Included observations: 43

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
***| . |	***| . |	1	-0.420	-0.420	8.1091	0.004
. | . |	**| . |	2	-0.041	-0.263	8.1884	0.017
.*| . |	**| . |	3	-0.059	-0.249	8.3562	0.039
. | . |	**| . |	4	0.014	-0.197	8.3663	0.079
. |*. |	. | . |	5	0.084	-0.047	8.7237	0.121
. | . |	. | . |	6	0.022	0.046	8.7482	0.188
. | . |	. | . |	7	-0.043	0.034	8.8454	0.264
. | . |	. |*. |	8	0.039	0.104	8.9286	0.348
. | . |	. |*. |	9	0.022	0.153	8.9571	0.441
.*| . |	. | . |	10	-0.117	-0.031	9.7663	0.461
. |*. |	. | . |	11	0.070	-0.007	10.061	0.525
. | . |	. | . |	12	0.048	0.057	10.206	0.598
.*| . |	. | . |	13	-0.065	-0.049	10.482	0.654
. | . |	.*| . |	14	-0.013	-0.095	10.494	0.725
. | . |	. | . |	15	0.046	-0.003	10.641	0.778
. | . |	. |*. |	16	0.041	0.078	10.763	0.824
. | . |	. | . |	17	-0.026	0.050	10.814	0.866
. | . |	. | . |	18	-0.029	0.046	10.878	0.899
. | . |	. |*. |	19	0.012	0.070	10.890	0.927
. | . |	. | . |	20	0.011	0.021	10.901	0.949

Unit Root Test of First Differenced Kelebek

Null Hypothesis: D(DKLBMO) has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic based on SIC, MAXLAG=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.368070	0.0001
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DKLBMO,2)
Method: Least Squares
Date: 06/01/09 Time: 13:46
Sample (adjusted): 2000Q2 2008Q4
Included observations: 35 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DKLBMO(-1))	-11.21339	2.088906	-5.368070	0.0000
D(DKLBMO(-1),2)	8.583158	1.968532	4.360181	0.0002
D(DKLBMO(-2),2)	6.576490	1.706340	3.854151	0.0007
D(DKLBMO(-3),2)	4.488975	1.324083	3.390252	0.0022
D(DKLBMO(-4),2)	2.632752	0.895610	2.939619	0.0067
D(DKLBMO(-5),2)	1.270465	0.496101	2.560897	0.0163
D(DKLBMO(-6),2)	0.396613	0.186752	2.123734	0.0430
C	205596.5	551028.9	0.373114	0.7120

R-squared	0.928390	Mean dependent var	-111429.3
Adjusted R-squared	0.909824	S.D. dependent var	10816325
S.E. of regression	3248071.	Akaike info criterion	33.02265
Sum squared resid	2.85E+14	Schwarz criterion	33.37816
Log likelihood	-569.8964	F-statistic	50.00572
Durbin-Watson stat	2.216067	Prob(F-statistic)	0.000000

Model Fit AR(1)

Dependent Variable: D(KLBMO)
Method: Least Squares
Date: 05/02/09 Time: 13:33
Sample (adjusted): 1998Q3 2008Q4
Included observations: 42 after adjustments
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-20343.21	316870.2	-0.064200	0.9491
AR(1)	-0.451752	0.144309	-3.130443	0.0033

R-squared	0.196782	Mean dependent var	-49923.50
Adjusted R-squared	0.176701	S.D. dependent var	3284946.
S.E. of regression	2980622.	Akaike info criterion	32.69961
Sum squared resid	3.55E+14	Schwarz criterion	32.78236
Log likelihood	-684.6918	F-statistic	9.799672
Durbin-Watson stat	2.290791	Prob(F-statistic)	0.003256

Inverted AR Roots	-.45

Correlogram of Residuals

Date: 06/01/09 Time: 13:44
Sample: 1998Q1 2008Q4
Included observations: 43

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. | . |	. | . |	1	0.015	0.015	0.0099	0.921
.*| . |	.*| . |	2	-0.076	-0.077	0.2860	0.867
.*| . |	.*| . |	3	-0.079	-0.078	0.5911	0.898
. | . |	. | . |	4	0.040	0.037	0.6706	0.955
. |*. |	. |*. |	5	0.102	0.091	1.2027	0.945
. |*. |	. |*. |	6	0.090	0.089	1.6267	0.951
. | . |	. | . |	7	0.007	0.026	1.6296	0.977
. | . |	. | . |	8	0.022	0.049	1.6563	0.990
. | . |	. | . |	9	-0.022	-0.015	1.6848	0.996
.*| . |	.*| . |	10	-0.110	-0.123	2.3953	0.992
. | . |	. | . |	11	0.030	0.013	2.4483	0.996
. | . |	. | . |	12	0.048	0.015	2.5920	0.998
.*| . |	.*| . |	13	-0.095	-0.122	3.1761	0.997
. | . |	. | . |	14	-0.035	-0.020	3.2565	0.999
. | . |	. | . |	15	0.038	0.057	3.3568	0.999
. | . |	. | . |	16	0.036	0.033	3.4518	1.000
. | . |	. | . |	17	-0.045	-0.042	3.6052	1.000
.*| . |	. | . |	18	-0.078	-0.042	4.0783	1.000
. | . |	. | . |	19	0.007	0.023	4.0818	1.000
. | . |	. | . |	20	0.027	-0.010	4.1411	1.000

8. REFERENCES

BOOKS

Baumol, William J.; Blinder, Alan S.; **Economics: Principles and Policy**, Orlando: The Dryden Press, 1998

Black, A. and C.; **Dictionary of Economics**, London: A & C Black Publishers Ltd., 2006, p.211

Case, Karl E.; Fair, Ray C.; **Principles of Economics**, New Jersey: Prentice Hall, Inc.

Damodaran, Aswath; **Investment Valuation**, New York: John Wiley & Sons Inc., 2002

Daves, Philip R.; Ehrhardt, Michael C.; Shrieves, Ronal E.; **Corporate Valuation: A Guide for Managers and Investors**, Ohio: South-Western, 2004

Makridakis, Spyros; Wheelwright, Steven C.; Hyndman, Rob J.; **Forecasting Methods and Applications**, New York: John Wiley and Sons, Inc. 1998

Naik, Ranjit; **Financial Modeling for Corporate Finance**, London: Euromoney, 2002

Palepu, Krishna G.; Healy, Paul M.; Bernard, Victor L.; **Business Analysis and Valuation**, Ohio: South-Western, 2004

Pratt, Shannon P.; **Valuing Small Businesses and Professional Practices**, Blacklick: The McGraw-Hill Companies, 1998

Reilly, Robert F.; Schweihs, Robert P.; **Valuing Intangible Assets**, New York: McGraw Hill, 1999

Ryan, Bob; **Corporate Finance and Valuation**, London: Thomson Learning, 2007

Smith, Gordon J.; **Trademark Valuation**, New York, John Wiley & Sons Inc., 1996

ARTICLES

AAA Financial Accounting Standards Committee, "Equity Valuation Models and Measuring Goodwill Impairment", **Accounting Horizons**, 2001, Vo.15 No.2, pp. 161-170

Ali, Ashiq; Klein, April; Rosenfeld, James; "Analysts' Use of Information about Permanent and Transitory Earnings Components in Forecasting Annual EPS", **Accounting Review**, 1992, Vol. 67 Issue 1, pp. 183-198

Barth, Mary E.; Beaver, William H.; Hand, John R. M.; Landsman, Wayne R.; "Accruals, Accounting-Based Valuation Models, and the Prediction of Equity Values", **Journal of Accounting, Auditing & Finance,** 2005, Vol. 20 Issue 4, pp.311-345

Barth, Mary E.; Beaver, William H.; Hand, John R. M.; Landsman, Wayne R.; "Accruals, Cash Flows and Equity Values", **Review of Accounting Studies,** 1999, Vol. 4 Issue 3/4, pp.205-229

Bernard, Victor L.; "The Feltham-Ohlson Framework: Implications for Empiricists", **Contemporary Accounting Research**, 1995, Vol. 11 Issue 2, pp. 733-747

Bertoncel, Andrej; "Acquisition Valuation: How to Value a Going Concern", **Our Economy (Nase Gospodarstvo)**, 2006, Vol. 52 Issue 5/6, pp. 116-125

Boztepe, Suzan; "User Value: Competing Theories and Models", **International Journal of Design**, Vol. 1 No.2, 2007, pp. 55-63

Damodaran, Aswath; "Valuation Approaches and Metrics", **Foundations and Trends in Finance**, 2005, Vol. 1 No. 8, pp. 693-784

Dechow, Patricia M.; Hutton, Amy P.; Sloan, Richrad G.; "An Empirical Assessment of the Residual Income Valuation Model", **Journal of Accounting and Economics**, 1999, Vol. 26 Issue 1-3, pp. 1-34

Feltham, Gerald A.; Ohlson, James A.; "Valuation and Clean Surplus Accounting for Operating and Financial Activities", **Contemporary Accounting Research**, 1995, Vol.11 No.2, pp. 689-731

Francis, Jennifer; Olsson, Per; Oswald, Dennis R.; "Comparing the Accuracy and Explainability of Dividend, Free Cash Flow, and Abnormal Earnings Equity Value Estimates", **Journal of Accounting Research**, 2000, Vol. 38 Issue 1 pp. 45-70

Gordon, Myron J.; Shapiro, Eli; "Capital Equipment Analysis: The Required Rate of Profit", **Management Science**, 1956, Vol. 3 No. 1, pp. 102-110

Gürbüz, A. Osman; Tantan, Saadet; Yolsal, Handan; "The Effect of Stock Splits on Excess Returns: Evidence from Istanbul Stock Exchange", EFMA Athens, 2000, Working Paper Series, http://ssrn.com/abstract=253408

Imhoff, Eugene; Pare, Paul V.; "Analysis and Comparison of Earnings Forecast Agents", **Journal of Accounting Research**, 1982, Vol.20 Issue 2, pp. 429-439

Jenkins, David S.; "The Benefits of Hybrid Valuation Models", **CPA Journal**, 2006, Vol. 76 Issue 1, pp. 48-50

Jenkins, David S.; Kane, Gregory D.; "A Contextual Analysis of Income and Asset Based Approaches to Private Equity Valuation, **Accounting Horizon**, 2006, Vol. 20 No. 1, pp.19-35

Kaplan, Steven N.; Ruback, Richard S.; "The Valuation of Cash Flow Forecasts: An Empirical Analysis", **Journal of Finance**, 1995, Vol. 50 No. 4, pp. 1059-1093

Lee, Charles M. C.; Myers, James; Swaminathan, Bhaskaran; "What is the Intrinsic Value of the Dow", **Journal of Finance**, 1999, Vol. 54 Issue 5, pp. 1693-1741

Lee, Charles M. C.; "Accounting Based Valuation: Impact on Business Practices and Research", **Accounting Horizons**, 1999, Vol. 13 No. 4, pp. 413-425

Lorek, Kenneth S.; "Predicting Annual Net Earnings with Quarterly Earnings Time-Series Models", **Journal of Accounting Research**, 1979, Vol.17 Issue 1, pp. 190-204

Lorek, Kenneth S.; Willinger G. Lee; "The Earnings Forecasting Conundrum", **Management Accounting Quarterly**, 2003, Vol.5 No.1, pp. 63-68

Lundholm, Russell J.; "A Tutorial on the Ohlson and Feltham/Ohlson Models: Answers to Some Frequently Asked Questions", **Contemporary Accounting Research**, 1995, Vol.11 No.2, pp. 749-761

Mundy, Bill; "The Scientific Method and the Appraisal Process", **the Appraisal Journal**, Vol. 60, Issue 4, 1992, pp. 493-499

Ohlson, James A.; "Earnings, Book Values, and Dividends in Equity Valuation", **Contemporary Accounting Research**, 1995, Vol.11 No.2, pp. 661-687

Öker, Figen; Demir, Volkan; Perek, Seda, "The Evolution of Turkey's Accounting and Auditing System on the way Towards the European Union", **Journal of Interdisciplinary Economics**, 2009, Vol. 20 Nos. 3&4, pp.315-342

Penman, Stephen H.; "Handling Valuation Models", **Journal of Applied Corporate Finance**, 2006, Vol.18 No.2, pp. 48-55

Penman, Stephen H.; Sougiannis, Theodore; "A comparison of Dividend, Cash Flow, and Earnings Approaches to Equity Valuation", **Contemporary Accounting Research**, 1998, Vol.15 No.3, pp. 343-383

Perek, A. Atilla; "Estimation of Discount Rate for Intangible Assets According To IFRS Terms – II", Mali Çözüm Dergisi / Financial Analysis, 2008, Issue 85, pp. 59-73

Pratt, Shannon P.; Reilly, Robert F.; Schweihs, Robert P.; **the Analysis and Appraisal of Closely Held Companies**, USA: Mc-Graw Hill Companies, 2000, p. 218-219

Preinreich, Gabriel A. D.; "Annual Survey of Economic Theory: The Theory of Depreciation", **Econometrica**, 1938, Vol.6 No.3, pp219-241

Reilly, Robert F.; "The Valuation of Intangible Assets", **National Public Accountant**, Vol. 41, Issue 7, 1996, pp. 26-33

Thomas, Rawley; Schostag, Randy; "Discounted Cash Flow Method: Using New Modeling to Test Reasonableness", **Valuation Strategies**, 2006, Vol. 10 Issue 1, pp. 24-41

OTHER SOURCES

Capital Markets Board, Communiqué Serial 8, No.45, Turkish Valuation Standards, Guidance Note 6, 2006, www.spk.gov.tr, April 2009, http://www.spk.gov.tr/apps/teblig/index.aspx?lang=T,

TCMB report; Survey of Expectations, April 22, 2009, www.tcmb.gov.tr, May 2009, http://www.tcmb.gov.tr/ikt-yonelim/beklenti/beklentiengyeni.html