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**TECHNICAL ANALYSIS METHOD FOR STOCK VALUATION:
AN APPLICATION IN THE ISTANBUL STOCK EXCHANGE**

Dilaysu Çınar

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DECLARATION

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ÖZET
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**HİSSE SENEDİ DEĞERLEMESİNDE TEKNİK ANALİZ YÖNTEMİ:
İMKB’DE BİR UYGULAMA**

Dilaysu ÇINAR

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Günümüzde İMKB’de işlem gören hisse senedi sayısının her geçen gün artması, yatırımlarını hisse senedi üzerinden gerçekleştiren yatırımcılar için gerek hangi hisse senedinin seçileceği, gerekse alınan hisse senedinin hangi zamanda alınıp satılacağı ve hangi fiyattan yatırım yapılacağı hususlarını ortaya çıkarmıştır. Bu sorunları tümünden ortadan kaldıracabilecek herhangi bir yöntem bulunmamakla birlikte, sorunların çözümüne katkıda bulunan birçok yöntem ortaya çıkarılmıştır. Bu yöntemlerden birisi de Teknik Analiz Yöntemi’dir.

Teknik analiz, belirli bir hisse senedine ilişkin fiyat ve işlem hacmi gibi verilerden yararlanır. Geçmişle ilgili olan bu verileri grafik formatına aktararak, hisse senedinin gelecekteki olası fiyatlarını ortaya koymaya çalışır.

Bu çalışmada hisse senedine ilişkin temel kavramlar açıklanmış, sonraki süreçte hisse senedi değerlendirme yöntemlerine yer verilmiş ve bu yöntemlerden teknik analiz yöntemi üzerinde odaklanılmıştır. Teknik analizde kullanılan trendler, formasyonlar ve indikatörler üzerinde derinlemesine durulmuş, ardından en önemli göstergelerden biri olan Bollinger Bandı ile ilgili olarak uygulama yapılmıştır. Uygulamada, İMKB Ulusal – 30 Endeksinde yer alan 23 hisse senedini 03.01. 2005 - 29.11.2010 tarihleri arasında değerlendirerek, “Bollinger Bandı kullanılarak, satın al ve elde tut yöntemine göre İMKB’de daha fazla gelir elde edilebilir mi?” sorusuna yanıt aranmıştır. Yapılan çalışmada Bollinger Bandı yöntemi ile İMKB Ulusal- 30 endeksinde, satın al ve elde tut yöntemine göre daha fazla kazanç sağlanabileceği ortaya çıkarılmıştır.

Anahtar Kelimeler: Hisse senedi değerlendirme yöntemleri, teknik analiz, Bollinger bandı

ABSTRACT
Master's Thesis

**TECHNICAL ANALYSIS METHOD FOR STOCK VALUATION:
AN APPLICATION ON THE ISTANBUL STOCK EXCHANGE**

Dilaysu ÇINAR

**Dokuz Eylül University
Graduate School of Social Science
Department of Business Administration
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Today, increasing number of traded shares to each passing day has revealed to some problems for investors such as which stock will be chosen, time of stock buying and selling and also what price the investment be made. Although there is no single method that can eliminate these problems altogether, many methods have been found that contribute to the solution of these problems. One of these methods is Technical Analysis Method.

Technical analysis benefits from data such as price and trading volume that are related to a specific stock. Technical analysis tries to reveal possible future price of stock by transferring past data to the graphic format.

Basic concepts of stock and stock valuation methods are described in this study. Additionally, the study focuses on technical analysis method, which is one of the stock valuation methods. Trends, formations and indicators, which are used in technical analysis, are focused on in-depth, and then application is conducted with Bollinger Bands that is one of the most important indicators. In practice, this study is sought to answer this question “Can more revenue be obtained from Istanbul Stock Exchange by using Bollinger Bands according to buy and hold strategy?” question by evaluating 23 stock that are placed in ISE National- 30 Index between 03.01. 2005 - 29.11.2010 period. According to the findings, more revenue can be generated from ISE by using Bollinger bands.

Keywords: Stock valuation methods, technical analysis, Bollinger bands

**TECHNICAL ANALYSIS METHOD FOR STOCK VALUATION:
AN APPLICATION IN THE ISTANBUL STOCK EXCHANGE**

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ABBREVIATIONS

ADX	: Average Directional Index
CCI	: Commodity Channel Index
DI	: Directional Indicator
DMI	: Directional Movement Indicator
DX	: Directional Movement Index
MACD	: Moving Average Convergence / Divergence
MFI	: Money Flow Index
OBV	: On Balance Volume
SAR	: Stop and Reversal

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INTRODUCTION

The Istanbul Stock Exchange (ISE), which started up in 1986, has made an important place in twenty years by increasing the number of publicly traded corporations and market capitalization, as well as developing communication and technology infrastructure, economy and stock market mainly news, comment and analysis on the television, internet and print media expose to information overloaded to investors each passing day.

Under these conditions, the numbers of individual and institutional investors have gradually increased. The first problem, which is faced by investors, is to determine which stock would be invested. The other issue is timing of the decision to buy and sell while investing in. Systematic purchasing and selling strategy helps investors to make right investment decisions. These strategies are basically divided into two. The first one is fundamental analysis and the second one is technical analysis.

Fundamental analysis is a valuation method to determine the real value of the stock. This analysis is a long process that requires examining all factors of company and economy. Technical analysis is based on the assumption that share prices have a foreseeable trend. With the technical analysis method, stock price movement will be determined by a systematic study.

Purpose of this study is to investigate if technical analysis method is the most appropriate method to find selling and purchasing time.

The first part of the study defines stock definition, types of stock and also rights and liabilities for stock holders briefly. In the second part, the concepts of value and equity valuation methods are discussed. Fundamental Analysis, Technical Analysis, Efficient Market Hypothesis, Traditional and Modern Portfolio Analysis and Chaos Theory are explained and this section presents positive and negative sides of these methods.

The third part explains the concept of the technical analysis. Assumptions, which are based on technical analysis method and basic principles of Dow Theory, which is basis of the technical analysis and also charts which are used to technical analysis.

The fourth part of the study is related with trends. In this section; trend classifications and varieties, trend lines, trendline breakouts, trend channels and other things that are related to trends are mentioned.

The fifth part of the study is about formations. Types of formation and their meanings take place in this section.

The sixth section is related to indicators that are some of the most important things to stocks analysis. Indicator types, their formulations, meanings and interpretations are explained in this part.

The research methodology and findings are discussed in the seventh part of the study. On the other hand, the final part is the conclusion of this study and recommendations.

PART I

BASIC CONCEPTS

1.1. Definition

Stock is a financial asset, which represents and expresses the shares at limited partnership divided into shares with joint stock company.¹ In a joint stock company, the amount of capital is divided into shares and each stock represents participating nature and proportionately hosting.² Joint stock companies supply their stocks with export for providing shareholder's equity. Business may not release to public to all of the stock issued.³

On the contrary of bill of exchange, stock is a document of partnership. With this state, stock is a financial asset which is senior security on the stage of establishment and it is the latest reimbursement in case of dissolution of a partnership by Joint Stock Company.⁴ Stock yields money to shareholder while continuing joint stock company and making a profit. But stock's income isn't fixed as well as bill of exchange.⁵

According to The Turkish legal system, share holder is also partner of company. For that reason, share is abstract legal status which is separate from the owner's personality. Thus stock is indivisible whole in the face of company.⁶

1.2. Types of Stocks

According to 409th clause of Turkish Commercial Code, stocks are divided into three main types. Stocks are classified in respect of circulation; registered share

¹ C. SARIKAMIS, **Sermaye Pazarları**, 4th Press, Alfa Yayınları, İstanbul, 2000, p..31.

² G. RODOPLU, **Para ve Sermaye Piyasaları**, Tugra Ofset, Isparta, 2001, p.291.

³ A. CEYLAN, Turhan KORKMAZ, **Sermaye Piyasası ve Menkul Değer Analizi**, Ekin Kitapevi, Bursa, 2000, p.91.

⁴ C. SARIKAMIS, **op. cit.**, p.31.

⁵ M. KARSLI, **Sermaye Piyasası Borsa Menkul Kıymetler**, İrfan Yayıncılık, İstanbul, p.362.

⁶ G. RODOPLU, **op. cit.**, p.292.

and bearer stock; in terms of whether or not fully paid of remuneration; remuneration is fully paid and remuneration is completely unpaid; in point of gain advantage to owners; common stock and preference stock.

1.2.1. Registered Shares and Bearer Stocks

The importance of this distinction is emerging to operation in stock transfer. Conveyance on the bearer stock is completed to delivery. Registered share can assignee unless otherwise agreed to main contract. The transfer of registered share is possible with delivery to assignee of made bill and register stock ledger of company.⁷

In order to handover of bearer stock, submittal of share register on the purpose of turnover is enough. Although there are some benefits of bearer stock such as; to provide true anonymity, to help the spread of industrial property, to supply privacy in the sense of account owner, at the same time it is sayable that there are some disadvantages of bearer stock such as; in case of lost and stolen indenture, difficulties to proof of right ownership, to encourage to irrelevance in general meeting, necessity to deliver of indenture for the establishment of right of usufruct.⁸

Identity of partnership is written on the registered share and such a stock is arranged in the name of written person at the company's stock ledger. These are only handovers by financial turnover and transfer.⁹ Unless otherwise agrees at the prime contract, registered share is actual on the joint stock companies system. Advantages of these stocks are to determine the number of partners, to identify and follow up of partners, to protect assets, to prevent to alienation of association, to participate in general meetings and to prevent loss of tax. Besides these advantages, registered

⁷ ISE Guidebook, p.162.

⁸ M. BOLAK, **Sermaye Piyasası Menkul Kıymetler ve Portföy Analizi**, 3rd Press, Beta Yayınları, İstanbul, 1998, p.101

⁹ S. CANBAS, H. DOĞUKANLI, **Finansal Pazarlar**, 2nd Press, Beta Yayınları, İstanbul, October, 1997, p.33.

stock has got some disadvantages. These are: difficulties in the transfer of partnership shares, to prevent to going public and inability to provide privacy.¹⁰

1.2.2. Common Stocks and Preferred Stocks

If there is not provision to the contrary at the master agreement, stocks provide to equal rights to shareholders. These types of stocks are called common stocks.

Common stocks are normal and ordinary stocks. They provide equal voting rights to their shareholders on the general meeting. Also these stocks give to take share in company profits, encircling property rights to third party, in liquidation; participate to liquidation result after the payment of debt and primarily right of emption of new stocks will be issued.¹¹

As compared with common stocks, a portion of the stocks according to profit sharing and voting at the general meeting, as per article 401st of the Turkish Commercial Code, can be provide preferential rights to shareholders with the master contract. With the prime contract; special pay dividend can be predictable in certain amount of profit, some privilege can be recognized at stock rights usage, voting, participate in result liquidation and nominate for membership in the body.¹²

1.2.3. Founder Shares and Dividend Shares

Founder shares neither represent a particular share nor give the right of access to company management. Accordingly, during the foundation of the business, according to provision of the master contract, in exchange for people's service, founder shares give the right to participation in a part of the company's profit and bonus share is issued on condition that always to be written in the name of the founders (TCC. art. 402)

¹⁰ ISE Guidebook, p.162.

¹¹ H. SEYİDOĞLU, *Uluslararası Finans*, 3rd Press, Güzem Yayınları, İstanbul, 2001, p.315.

¹² ISE Guidebook, p.162

Dividend shares are stocks which don't represent financial interest and these shares are given to some people in exchange for several services and their receivable after foundation (T.C.C. art. 298)

1.2.4.Priced Stocks and Bonus Shares

Issued with a new commitment or a way to pay, other words, stocks, which are subject to having the value of saving, either were revealed the phase of establishment or were bought in raising capital with the use of preference by former partners or through public offer by third parties. In return for these shares payment is done from source of non-partnership to partnership. Here actually, values of the current shares being upgraded and actually made a payment of internal sources. In this case, because the new stocks are serial of the old stock, obtaining right to bonus shares to former partner, in other words they belong to sharers.¹³ In short, fund access isn't supplied to business with the bonus share.

1.2.5.Premium Stocks and No Premium Stocks

In the Turkish legal system, issue of non-par value capital stock is beside the mark. Stocks, which are exported with the face value, are called no premium stocks. Stocks, which are exported with high price of par value, are called premium stocks.¹⁴ In order for premium stock share, either predication must be found in prime contract or must be decided by the general assembly. In the registered capital system, on condition that authorized with prime contract, premium stocks may be issued with the decision of the board of directors.¹⁵

¹³ ISE Guidebook, p.163

¹⁴ L. ERDEM KARABIYIK, *Menkul Kıymetler Borsası ve Diğer Yatırım Alternatifleri*, 1st Press, Marmara Kitabevi, October 1997, p. 23.

¹⁵ M. BOLAK, *op. cit.*, p.102.

1.3. Rights and Liabilities of Stock Holder

1.3.1. The Right to Dividend

It is one of the most important rights of the allottee. According to TCC; dividend must not distribute unless legal and free reserves with other monies, which must be allocated in accordance with legislation and prime contract, are stray from net profit (TCC. art. 469).

1.3.2. Right of Access to Liquidation Balance

This right is valid if there is surplus after the result of liquidation. Each stockholder participates in this surplus to his proportion of share (TCC. art. 455). If the liquidation surplus is negative, it creates unpaid share with a limited debt. If share remuneration is fully paid, the debt is beside the point.

1.3.3. Right of Access to Company Management

This right is to choose the company board of directors and even to be chosen to this board. Company general board, as the main body of the company, may intervene in almost every subject. However, because of the administration right often provided with ordinary majority of general assembly, person or people, who are occupant to 51% of the company, may have to administration. But, if the capital expansions to a broad ground, it takes an interesting look at many examples of management rights and it is seen that with the ten percent some companies are taken control. Involvement in management of minority shares can be provided with both special provisions, which is placed in master contract, and in some cases with the legal interferences (TCC, art. 341, 348, 349, 366, 367).

1.3.4. Right to Vote

According to TCC, it is vested right of the allottee. Each share gives to share holder at least one right to vote. Under the condition, don't offend against to this principal, number of voting rights, which would give to shareholders, can be determined with master contract (TCC, art. 373). Right to vote of a share can be increased, by means of provide to privilege on the vote but it isn't possible to limit the votes of each shareholder.

1.3.5. Right to Demand Information

According to TCC, right to demand information of allottees mustn't be limited or mustn't be obstructed to with main contract or with one of the company bodies' decision. In addition, allottees are entitled to point suspicious subject out to controller and wanted to necessary explanation from controller. Nonetheless, allottees can be examined into profit and loss account, balance sheet and annual report beginning from general meeting for one year (TCC, art. 362, 363). However, these rights are not included in right to demand information in real terms. Because, with the exception of secrets to be learned, which are allowed to examine books and documents, any partner is authorized to learning company's business secret (TCC, art.363)

1.3.6. Secrecy Debt

Each allottee must keep company's counsel, even if separated from partnership (TCC, art. 363).

1.3.7. Capital Debt

Stocks as a partnership indenture, provides to some rights to shareholder, also it brings to some financial responsibilities to shareholder. Both new organization and increase of capital, shareholder, who is subscribed for, supposed to fulfill a common undertaking. Shareholder must deposit to called-up capital of shares, which have

undertaken, on the determined date by company's administrative body. If company, which isn't completely payment of capital, goes bankrupt or it is subjected to liquidation, it can be demanded unpaid part of liquidation from shareholders for discharge of company.

1.4.Earning of Stocks

Earnings, which are provided to shareholders, are divided into three parts. These are:

1.3.8.Profit Share Earnings

Join stock companies distribute to a portion of profits, which are get each year, to their partners, the rest of profits are evaluated as a source for autofinancing, to hold within the company.

According to TCC and Capital Market Law; join stock companies can pay dividend from net profit that year or if general assembly decides, to reserve funds, which are separated for this purpose, can pay dividend. However, if company is unable to make profit in that fiscal year, company must not be forced to profit distribution in no event.

1.3.9.Capital Gain (Stock Value Increase in Due Course)

Capital gain, arising from stock value increase depending on the development of the company in due course, shows to a balanced growth with profit share with countries where were located in developed capital markets. However in Turkey, profit share earnings remain at very low levels, expectation of capital gain comes to the forefront on the stock investment. While companies declare to their rate of profit share, which will be distributed, they indicate the ratio of the distributed profit share to its nominal value.

1.3.10. Realized Revenue in Exchange to Stock Warrant

Another right, which is provided to shareholder, is stock warrant. This right is related to new stock taking right at a premium price, which is on the nominal price, increasingly response to each stock at hand from new capital at increase of capital.

Stock warrants are purchasable and sellable differently from proprietary rights which are represented by stock. For that reason, obtained revenue, which is obtained as a result of sale, is considered as stock revenue. Value of stock warrant is differences between previous and next value from capital stock increase.¹⁶

1.4. Value and Price Characterizing of Stocks

1.4.1. Value Characterizing

Stock value characterizing is in use for the detection measurements on the stock productivity and it deals with analysis. The main of them can be listed as follow:

1.5.1.1. Book Value

Book value is evaluation of owner's equity with balance sheet value of business. In this case the book value can be expressed as follows:

Book Value = Total Assets – Liabilities¹⁷

If the owner's equity of business is higher than the paid-up capital, book value is higher than nominal value; otherwise book value will be lower than nominal value.

¹⁶ S. CANBAS, Hatice DOGUKANLI, *op. cit.*, p.26-28.

¹⁷ M. K. ERCAN, Ünsal BAN, *Finansal Yönetim*, Gazi Kitabevi, August 2005, p.118.

1.5.1.2.Liquidating Value

The company's liquidating value is the rest of amount that value received as a result of cash-in to all assets of company, after payment of company's debt.¹⁸ Liquidation value of per stock which occurs with rest of the amount is divided by the total number of stocks.

Liquidating value is important to investigate the marketing value. Because, for the market value of company's stocks, liquidating value lower limit will be constituted. When the stock's market value drops down below to liquidating value, it will be the most rational way to liquidate the business.

1.5.1.3.Net Asset Value

Net asset value is a method used to calculate the stock value of company which has assets that can be realized immediately.¹⁹ Net asset value is possible to examine as the value of tangible assets and real genuine assets value. The value of tangible assets considered the reconstruction cost of company's machine, equipment and other fixed assets will have the same characteristics. On the other side, real genuine asset takes into account both tangible assets and intangible assets which remained hidden on company statement and will not bring-in immediately. Subjective intangible assets such as owned patents, rights of use, know - how, are included in valuation.²⁰

¹⁸ M. BOLAK, **op. cit.**, p.105.

¹⁹ M. KARSLI, **op. cit.**, p. 468.

²⁰ A. AKSOY, **Menkul Kıymet Yatırımlarının Analizi**, 2nd Press, Ankara, 1998, p.23

1.5.1.4.Actual Value

The actual value of share register is a value determined by variables such as company's assets, profitability condition, distributed dividends and capital structure. In a sense, actual value that investors find stock value is normal under the current situations.²¹

1.4.2.Price Characterizing

Major definitions in the concept of stock price are; nominal price, issue price, market price and stock exchange price.

1.5.2.1.Nominal Price

The nominal price is written price of share register. Nominal price is a value parted by the management of partnership, during the introduction of share register in order to determine the amount of capital and be able to account record in respect of this. According to TCC, nominal price of share register may be at least a piastre and this value can be upgraded at least one apiece piaster. In practice, 1000 Turkish Lira is the most frequently seen on the share register nominal price.

1.5.2.2.Issue Price

Issue price is a price of stocks that exposed for sale on the share issue phase. In Turkey generally, companies sell their new stock issued on nominal price, but at the same time they can determine emission price above par because companies issue stock, which has got a high value of the stock market.

1.5.2.3.Market Price

Market price is defined to buy and sell price of share register on the capital market. Market price consists of supply and demand conditions. Without any changing on the operating effectiveness, it can be observable that market price of

²¹ S. Ünal SAKAR, **Sermaye Piyasası**, Anadolu Üniversitesi Yayınları, Eskişehir, 1997, p.109.

share register can be changed in due course, dependently on changes in market conditions. Price can be formed under or on real value of stock. If the stock market exits, market price is used as equivalent with the stock exchange price.²²

1.5.2.4. Stock Exchange Price

Stock exchange price is a price of stock exchange securities which occur according to supply and demand conditions at the stock market. Prices are determined daily in accordance with operation of the stock market and prices are divided into categories such as; opening price, closing price, lowest price, top price and average daily price.²³

1.6. Encountered Risks in Stock Exchange Market

The general meaning of risk is stated as “an undesirable event or probability of effect occurrence”.²⁴ One of the biggest problems faced in the capital markets while taking an investment decision is to correlate between security’s risk and security’s possible proceeds. Because, the selection of investment instruments require a comparison of these two factors.²⁵

Stocks are known as the most high-risky investment vehicle at the financial markets. Stocks are under the influence of economic, political, psychological, external and innumerable periodic factors. The degree of influence of these factors may be different from the stock value. The investor has a constant risk. While part of this risk is controlled by the investor, other part results from factors which could not be controlled by the investor.²⁶

²² L. Erdem KARABIYIK, **op. cit.**, p.23-24.

²³ S. APAK, **Sermaye Piyasaları ve BORSA**, 1st Press, Bilim Teknik Yayınevi, İstanbul, 1995, p.34

²⁴ C. SARIKAMIS, **op. cit.**, p.163.

²⁵ E. TUZCU, **Hisse Senedi Fiyatlarını Etkileyen Faktörler ve İMKB’de Volatilité**, Unpublished Postgraduated Thesis, Ankara University, Institute of Social Science, Ankara, 1999, p.10.

²⁶ M. DİRİL, **Hisse Senetlerine Yatırım ve Türkiye’de Hisse Senedi Fiyatlarını Etkileyen Faktörler**, Unpublished Postgraduated Thesis, Balıkesir University, Institute of Social Science, Balıkesir, 2000, p.16.

The risk concept on the financial markets may be examined in two groups as systematic and unsystematic risk.²⁷

1.4.3.Systematic Risk

Systematic risk, also known market risk, is a risk category which is carried by the market and all financial assets, which are traded in market, are affected. Market risk is put forward by economic, social and political conditions which are arisen out of a financial asset and market risk signs to danger which is affected to the efficiency of financial asset.²⁸

Compared to developed countries' economies, stocks, in Turkey's capital market have very-high systematic risk. Therefore, changes in interest rates or exchanges rate are able to immediately affect stock prices in ISE.²⁹ Systematic risk sources are as follows:

1.6.1.1.Market Risk

Changes to the social and economic structure of the country, implemented a new economic policies, to be an election year, political activities increased, an unexpected war affects the market.³⁰

Market risk can be defined as; changes in investors' expectations to reveal the probability of loss by causing stock price fluctuations. Fall of the stock price is negative influence on investment's yield and this situation is called market risk.³¹

1.6.1.2.Interest Rate Risk

Yield changes depend on changes in interest price of financial assets this situation occurs to interest rate risk.³² Interest rate adversely affects stock price.

²⁷ H.B. MAYO, **Investments: An Introduction**, Mc.Graw Hill, New York, 1997, p.157.

²⁸ C. SARIKAMIS, **op. cit.**, p.177.

²⁹ H. KANALICI, **Hisse Senedi Fiyatlarını Tespiti ve Tesir Eden Faktörler**, SPK Yayınları, Edition No: 77, 1997, p.12.

³⁰ H. KANALICI, **op.cit.**, p.15.

³¹ M. DİRİL, **op.cit.**, p.19.

While interest rate is rising, stock prices fall; while interest rate is falling, stock prices raise. This is because; stock prices are equal to sum of market interest rate with discounted values of revenues which are provided future.³³

Short-term changes in interest rates are largely arise from economical fluctuations. For this reason, it is difficult to predict the direction of interest rate changes on the period of high economic uncertainty. This situation further increases to interest rate risk which is one of the most important indicators affecting stock prices. While end of period proceeds is specific, stocks haven't got fixed proceeds. Therefore, due to increase of risk on the period, when watched particularly high rate of interest, demand for stocks fall.³⁴

1.6.1.3.Purchasing Power Risk (Inflation Risk)

Purchasing power risk reduces purchasing power of applied cash to investment with the effect of inflation and indirectly it reduces efficiency of financial assets which are calculated by fixed currency.

Investor expectations' about inflation has different effect on financial assets which represent ownership and debt. Because the financial assets, which are represented debt, are fixed proceeds, inflation has a negative effect on most of their returns and yields. On the other hand, stocks, which are represented by the ownership, are able to provide the opportunity to reduce the impact of inflation and obtain more monetary income due to inflationary profits. To avoid the negative effects of inflation, investors start to shift their investments in stocks.³⁵

³² C. SARIKAMIS, **op. cit.**, p.177.

³³ M. BOLAK, **op.cit.**, p.137.

³⁴ M. DİRİL, **op.cit.**, p.19.

³⁵ C. SARIKAMIS, **op. cit.**, p.178.

1.6.1.4.Currency Risk

Currency risk is an undertaken risk in very special cases such as; invest in any esteem or run in debt or have money owed on different currencies of investor or organization which is done to investment.

In case of evaluation of investors' funds on esteems which is based on foreign currencies, currency risk is in question. In our day, the importance of currency risk became more evident as a result of acceleration of fund movements between countries in face of increasing globalization in capital markets and money markets.³⁶

1.6.1.5.Political Risk

Political risk explains changes on political conditions which would be the cause of dividend income. Political risk also emerges as a reflection of national and international political developments.³⁷

Conservation initiatives, quotas, exchange rate fluctuations or foreign capital investments are the elements of this risk. Especially in recent years, to liberalization of financial markets within the market globalization framework increase the impact of this risk even more.

In brief, political risk is a kind of risk that, it is used to describe changes in political conditions which will bring in the changes of share earnings.³⁸

1.4.4.Non - Systematic Risks

Unsystematic risk is directly related to business itself. These risk sources are; mismanagements concerning to top management, going on workers' strike, wrong financial politicians with wrong management decisions, new inventions, advertising campaigns and changes in consumer preferences.

³⁶ _____, **Sermaye Piyasası ve Borsa Temel Bilgiler Kılavuzu**, İstanbul Menkul Kıymetler Borasası Yayınları, 16th Edition, İstanbul, 2001, p.508.

³⁷ L. Erdem KARABIYIK, **op. cit.**, p.80.

³⁸ M. DİRİL, **op.cit.**, p.20.

Unsystematic risk will be different for every business, for that reason; risk control and reduction of risk are possible with diversification which will be done by investor. We can examine unsystematic risks under the following headings:

1.4.4.1.Business and Industry Risk

It refers to undesirable results which are generating from negative situations that may occur in sector, which are located in business, or that may occur in business which are issued to stocks. These reasons are; mismanagements, disruptions on the goods or services, business line strikes, difficulties in the provision of the raw materials, un-solicited statuses reaching to customer, decrease in sales due to competition. Adverse events in these areas reduce the firm's operating profits and reduce stock yield.³⁹

1.4.4.2.Financial Risk

Financial risk emerges as company revenues' loss to company's liquidation as a result of debt and go down below to level of company's income, which will make interest and dividend payment, in consequence of company lag behind to private or general mutation on environmental conditions.

1.4.4.3.Liquidity Risk

Liquidity risk expresses, asset's dispose to under its current market, as a result of assets owned cannot converted into money on demand or some of difficulties encountered when performing this operation.

Liquidity risk is closely related to secondary market which is treated of securities and securities owned. Liquidity risk does not emphasize on the continuous and active markets where securities', which are similar or standard characteristics, have got many buyers and sellers.

³⁹ M. DİRİL, *op.cit.*, p.23.

Liquidity risk also closely related to the number of securities held by the investor, their market capitalization, and property right of conveyance is costly. Liquidity risk on the short-term securities is usually less than long-term securities.⁴⁰

1.4.4. Managerial Risk

Companies can meet a very positive occasion over time. If company does not have strong managerial staff to evaluate the opportunities, expected returns may be significant reductions.⁴¹

Incorrect management decision usually has a negative impact on company's profit. Such a situation leads to decline to stock prices.⁴²

1.5. Economic Function of the Stock

The effects of the stock are very important for economy. These economic functions are listed as follows⁴³:

- Stocks provide to necessary capital accumulation for a rapid development by bringing together to small savings of the masses in large businesses.
- Stocks provide a more balanced income distribution and they spread to wide base to economic welfare by apportioning the ownership of commercial enterprise to large mass of people.
- Stocks complement the economic aspect of democracy by doing more or less arbiter to public on the economical decisions.
- Stocks while providing additional income for the people savings, stock provides this income which is not related to in favour of interest, this income which is resistant versus inflation and together improves with the inflation.

⁴⁰ _____, **Sermaye Piyasası ve Borsa Temel Bilgiler Kılavuzu**, op.cit., p.507.

⁴¹ G. RODOPLU, **op.cit.**, p.365.

⁴² C. SARIKAMIS, **op. cit.**, p.181.

⁴³ Türkiye Sermaye Piyasası Aracı Kurumlar Birliği, **Hisse Senedi Piyasaları**, Sermaye Piyasası Temel Düzey Lisans Eğitimi, Oct. 2004, <http://www.tspakb.org.tr/index_tur.htm>,p.11.

For that reason, stocks protect the value of both income and investment against the inflation.

- Stock is a financial tool that eliminates to middleman. When a company needs a large amount of funds as investment and operation capital, the funds, which provide some other way without stock issue, have middleman cost.

PART II

THE STOCK VALUATION METHODS

There are many methods, theories and hypothesis developed for the valuation of the securities. The most important of these are fundamental analysis, technical analysis, efficient market hypothesis, traditional and modern portfolio theory.

Efficient Market Hypothesis with Markowitz mean-variance model, index models, Financial Asset Valuation Model and Arbitrage Pricing Theory, which are located in Modern Portfolio Analysis, are scientific analysis methods that are created according to statistical and mathematical foundations.⁴⁴

Market efficiency is an important phenomenon in terms of valuation methods. For this reason, it primarily focuses on the concept of Efficient Markets.

2.1. Efficient Market Hypothesis

On the effectiveness of the financial markets, three main criteria propound in general and these criteria are tested empirically by academia. Aforementioned criteria are allocational efficiency, operational efficiency and informational efficiency. Allocational efficiency provides best distribution of the resources. Operational efficiency performs the minimum cost of resource transfer. Informational efficiency means all available information reflects to on market prices. If the market is less active on the informational sense, prices are easily manipulated, market moves away from liberalization, market requires public intervention, pave the way for unlawful profit and most importantly, it has a negative impact on capital accumulation and economic growth.⁴⁵

⁴⁴ I. E. USTUNEL, *Durağan Portföy Analizi ve İMKB Verilerine Uygulanması*, ISE Publication, Ankara, 2000, p. 1.

⁴⁵ Dr. T. OZMEN, *Dünya Borsalarında Gözlemlenen Anomaliler ve İstanbul Menkul Kıymetler Borsası Üzerine Bir Deneme*, CMB Publication Ankara, , 1997, p. 1.

In general, a security market is defined as efficient if prices of securities fully reflect on all available information and this prices response to new information in the manner that sudden or close to it.⁴⁶

Today, for such a definition to be valid, some conditions must exist. It is possible to compile the following conditions:⁴⁷

- a) It should be an excellent competition in the market, should not have monopolies.
- b) The institutional and informational exchange costs or restrictions should not be on account. Therefore, all of the investors should be reaching simultaneously to current and future information which are related to investors' expectations about future.
- c) All investors should have a homogeneous opinion and they should interpret obtained information by analyzing in the same way. As a result, they should get the same information function.
- d) All investors should pay attention to market prices and they should use their knowledge functions for maximizing benefits which are expected by them.

Any new information is reflected immediately and altogether to prices on the efficient market. New information is a surprise (anything that can be predicted is not surprise). Price changes can be positive as much as negative in the efficient market, because good surprises are possible as well as bad surprises.⁴⁸

Efficient market hypothesis classifies three sub-groups to information set which is reflected on the price of securities.

- a) Information concerning the past prices of the securities.
- b) All information is open to public, such as; announce profits which are reached to market, stock split, capital increase, interest rate changes regarding

⁴⁶ Dr. G. OZER, **Muhasebe Karları İle Hisse Senedi Verimleri Arasındaki İlişkiler - İMKB'de Deneyisel Bir Analiz**, Ankara, CMP Publication, 1996, p. 40.

⁴⁷ Dr. G. OZER, **op.cit.**, p.40.

⁴⁸ Dr. G. OZER, **op.cit.**, p.40.

developments in financial markets, changes in government's economic policy and so on.

- c) All possible information which are related to intercorporate and stock.⁴⁹

Efficiency of the market is rated according to each set of information. The first sub-group is weak efficient market hypothesis, the second sub- group is semi-strong efficient market hypothesis, and the third sub-group corresponds to the strong efficient market hypothesis.⁵⁰

2.1.1. Weak Efficient Market Hypothesis

Weak efficient market hypothesis assumes that stock prices contained to all of the information such as; course of prices in the previous period, rates of return, transaction volume, odd lot operations. Weak efficient market hypothesis agrees that any relationship between prospective rates of return and rates of return in the previous periods because, weak efficient market hypothesis assumes that stock prices reflect to all of the past information. Therefore, weak efficient market hypothesis argues that it was impossible to achieve above average returns with any investment strategy which formed by using market information or rates of return in the past.⁵¹

Weak efficient market hypothesis tests to random walk. In other words, this research examines the effect of all information related to stock when price of any stock are changed. If the weak form of efficient market is valid, price changes occur completely at random. Thus, price changes in a period are statistically independent from other price changes in other period. Therefore, studies that are aimed at tested for weak form of efficient market theory, acted with the belief that historical information related to securities cannot be used for obtaining abnormal profit. If

⁴⁹ Dr. M. KIYILAR, **Etkin Pazar Kuramı ve Etkin Pazar Kuramının İMKB'de İrdelenmesi –Test Edilmesi**, CMB Publication, Ankara, 1997, p. 16

⁵⁰ N. GUNAK, **İleri Teknik Analiz Uygulamaları**, 1st Press, Literatür Yayınları, İstanbul, 2007, p.28.

⁵¹ G. KONURALP, **Sermaye Piyasaları**, 2nd Press, Alfa Yayınları, İstanbul, 2005, p.306-307.

efficient market is weak, any graphics and/or analysis method, which are based on previous price, provides a profit to be abnormal.⁵²

Random walk hypothesis defined as “Prices do not have a memory and there is no relationship between yesterday and tomorrow” by Adam Smith. Random walk hypothesis suggests the price changes of a security from period to period are statistically independent on the security market.⁵³

Two different test groups are referenced for weak form of the efficient market hypothesis. The first group tests trying to show statistical independence between stock price changes. This kind of tests examine random walk hypothesis. The second test groups, test to buying and selling system. Also the second test groups, are against to “buy and hold” policy, trying to create a mechanical investment rule, which are depended to historical price information related to stock.⁵⁴

2.1.2.Semi-Strong Efficient Market Hypothesis

Semi-strong efficient market hypothesis have all the conditions of weak efficient market hypothesis. In addition of these, companies’ explanations to the public such as; annual profits of companies, how to make distribution of profit margin, capital increases, stock split, semi strong efficient market hypothesis, also, government statements made about general economic conditions, such as; interest rates, inflation rates and growth rates are very quickly reflected in stock prices on the semi- strong efficient market. Therefore, investors can not obtain excessive return above the market average.⁵⁵

⁵² Dr. M. KIYILAR, **op.cit.**, p. 2.

⁵³ A. KOSE, “Etkin Pazar Kuramı ve İstanbul Menkul Kıymeler Borsasında Etkin Pazar Kuramının Zayıf Şeklini Test Etmeye Yönelik Bir Çalışma – Filtre Kuralı Testi”, İstanbul University, **Journal of the School of Business Administration**, Vol:2, No:2, Nov. 1993, p. 109.

⁵⁴ A. KOSE, **op.cit.**, p.109.

⁵⁵ G. KONURALP, **op.cit.**, p.307.

2.1.3.Strong Efficient Market Hypothesis

If shares prices in the market reflect to all explained or unexplained information, it may be mentioned that efficient market is strong form. In this case; investors, who even get information from the inside, can not provide to constant gain over the market gain.⁵⁶

According as market efficient, actual price changes will function even more random. In this sense, price changes completely random an unpredictable on the strong efficient market hypothesis. Because of the little information advantage to be reflected to prices quickly, profit opportunities are eliminated rapidly. In this case, because the prices reflect to all available information, the possibility of making a profit from knowledge-based transactions is impossible.⁵⁷

In brief, Efficient Market Hypothesis is a critique of two main method used in the analysis of stocks. While weak efficient market hypothesis attacks to foundations of the technical analysis, semi-strong efficient market hypothesis opposes to method of fundamental analysis.⁵⁸

2.2. Fundamental Analysis

Fundamental analysis method is an evaluation method for the determination of the real value of the stocks. On this method, actual value of the stock is determined and firm is considered by utilizing to basic indicators, which are determined to stock prices, such as; competitiveness, macro-economic developments, managerial skill, market status, production and technological situation, capital structure, liquidity and profitability.⁵⁹

⁵⁶ M. BOLAK, **op.cit.**, p.227.

⁵⁷ S. DÖM, **Yatırımcı Psikolojisi**, 1st Press, Değişim Yayınları, İstanbul, 2003, p. 3.

⁵⁸ B. G. MALKIEL, **Borsada Rastgele Seyir**, Ali Perşembe (Çev.), 1st Press, Scala Yayıncılık, İstanbul, 2007, p.136.

⁵⁹ N. BERK, **Finansal Yönetim**, 7th Press,Türkmen Kitabevi, İstanbul, 2003, p. 370.

After the determination of the tendency of the economy on future periods, how do these developments affect to branch of industry and correspondingly, future cash flows of the firms are estimated. Basic assumption in the calculation of the real value; cash flows, which are provided by the firms in the future, are reduction to present value.⁶⁰

There is also market value for each stock, as well as real value. Market value is used as a benchmarking criterion on the decision stage. Assumption of the fundamental analysis is that market value of the stock will come close to real value of the stock sooner or later. Analysts give stock selection decisions under this assumption. If the market price of the stock is below to real value of the stock, assessment that stock is cheap and stock is taken. It is objective to retain the stock and profit from it until stock finds its real value. On the other hand, if the real value of the stock is below the market price of the stock, it is interpreted that stock is expensive and it is not suitable to take to stock.

Fundamental analysis consists of three phases. These are as follows:

- a. Economic Analysis
- b. Sector Analysis
- c. Company Analysis⁶¹

2.2.1.Economic Analysis

Macro economic expectations affect to company's financial structure and working conditions. Probability of success occurrence of the stock investment is higher than strong and growing economy. Primary basic indicators about the general economic situation are; gross national product, per capita income, inflation, foreign exchange and balance of payments, interest rates, public financial tools, money

⁶⁰ G. KONURALP, *op.cit.*, p.107.

⁶¹ A. UYAR, *Temel Analiz*, 1st Press, Beta Basım Yayın, İstanbul, 2001, p. 21.

supply, fixed investment expenditures, stimulus monetary and fiscal policies, economic growth and employment status.⁶²

Investors, who invest in international markets, determine to economies, which are their stock prices remained lower than other markets for various reasons, despite the rapid and steady growth on the investor' macro economical analysis. Thus; they both perform a risk assessment and they increase to their profitability.⁶³ The aim is not only to find of right stock, which can be invested, but also, to provide diversity in investments by determining to alternative markets.

Another issue, worthy of notice is to consider social and political risks, which are significantly affected by country's economic course, while doing economical analysis. Inequalities in income distribution, government changes, strike and other factors may lead to unrest on the economy.

2.2.2.Sector Analysis

Such as general economic factors, economic sectors' sensitivity to countercyclical is also important. When general of economy is in stagnation, a particular sector can be maintained to buoyant. In contrast, while the economy has boom, some sectors may be in recession or saturation due to their own. After decided that to suit investment of general economic factors, investor should choose between the various sectors by examining the sectoral data.⁶⁴

Sectors where are the industrial lifeline is important for investors in terms of both risk and return. While start-up and growth phase promise to high risk and return, sector, which is entered to maturity phase, ideal for investors who want less risk. Stocks of sector, which is entered to decline stage, will have no further interest of investors.

⁶² N. BERK, **op.cit.**, p.370.

⁶³ A. UYAR, **op.cit.**, p.22.

⁶⁴ M. KARSLI, **op.cit.**, p.482.

Other features, which are should be taken into account on the sector analysis, are as follows. Sector's sales revenues in the past period, growth earnings of the sector, supply and demand situation in the sector will occur in future periods, competitive conditions, labour force status, government policies, international relations, changes in social life, the market price of the stocks of other companies in the sector.⁶⁵

2.2.3. Company Analysis

Company analysis consists of examining to relations between the items in the financial statements and their trends that shown in over time for evaluate to financial condition of the company, company's operation results and development of financially, for determine to company's strengths and for make a prediction about the company's future.⁶⁶

The most important part of company analysis is the analysis of numerical data and detailed examination of the company's financial statement primarily to the company's income statement and company's balance sheet. In this way, company's cash flows, which would provide on future period, and discount rate, which is used for discounting the present value of cash flows, are tried to be determined. On the other hand, non-numeric information such as; company's quality of management team, union relations, profit distribution policies, competitive ability, benefit from the incentives, market share and company's shareholding structure are details that need to be analyzed.

For take a right investment decision, company's financial statement and company's footnote are needed to reflect accurately the actual status of the company. Otherwise, results to be obtained will cause just given the wrong investment decisions.

⁶⁵ N.GUNAK, **op.cit.**, p.33.

⁶⁶ A. UYAR. **op.cit.**, p.93.

2.3. Technical Analysis

Technical analysis examines the market movement using price charts, in order to predict direction of prices in future.⁶⁷ At the heart of technical analysis lies in analyzing past price movements. Technical analyst, ignoring all other data, is only concentrate on prices. Technical analysts draw graphs of historical price data that about stocks or statistics that are extracted from these data and they try to find “samples” from these graphs. Then they use these samples for predicting stock prices in future. Technical analysts also called chartist because a large part of technical analysis generates graphical analysis.⁶⁸

There are three basic theorem of technical analysis approach:

- a. Market action discounts everything
- b. Prices move in trends
- c. History repeats itself.⁶⁹

2.3.1. Market Action Discounts Everything

According to this hypothesis, demand and supply may be affected by informations in market that reflected in market and also reflected to price by the market.⁷⁰ In other words, discount process inhold all elements that may affect price. Market price, which appurtenant stock, is determined according to supply and demand of this stock. There are many factors that affect supply and demand in the market. While some of these factors are a set of main factors such as; main economic indicators, sectoral data, financial statements of firms, explanation of the profit distribution or political and social factors, on the other hand, other factors are

⁶⁷ A. PERŞEMBE, **Teknik Analiz mi Dedin? Hadi Canım Sende! 1**, 1st Press, İstanbul: Scala Yayıncılık, 2001, p. 12.

⁶⁸ F. ÖZÇAM, **Teknik Analiz Ve İstanbul Menkul Kıymetler Borsası**, 1st Press, Ankara: CPM Pblcation, 1996, p.16.

⁶⁹ J. J. MURPHY, **Technical Analysis Of The Financial Markets**, New York: New York Institute Of Finance, 1999, p. 2.

⁷⁰ A. ÖZEKŞİ, **Kazanma Sanatı**, 1st Press, İstanbul: Alfa Yayınları, 2005, p. 5.

psychological factors such as; expectations, investors' sorrows, joys, thoughts, ambitions. One of the most important idiosyncrasies of technical analysis takes into account market psychology. Prices change not only the basic data, also psychology of investors.

2.3.2.Prices Move in Trends

The second assumption is that prices act with trends and investors tend to participate to trend. According to this assumption, prices follow to specific trends in specific periods and the important point is to find the start and end points of these trends.⁷¹

Technical analysts believe that after the new information, which may affect market demand and supply, reach to market, new information is reflected to share prices some time later.⁷²

2.3.3.History Repeats Itself

The most important principle of technical analysis and market movement is associated with human psychology. For example, formations, which are shown rises or declines psychology in market examined on price charts since a century, have been identified and categorized. Formations, which have good result, are considered to give good results in the future period. Formations based on human psychology don't tend to change. Thus, investors will tend to repeat of their behavior because of their unchanged psychology and similar prices movements may be observe on charts in due course. To put it another way this last proposition, the key to understanding the future can be obtained from examined to history or future is only repetition of past.⁷³

⁷¹ A. ÖZEKŞİ, **op.cit.**, p.5.

⁷² G. KONURALP, **op.cit.**, p.139.

⁷³ J.J. MURPHY, **op.cit.**, p.4-5.

2.4. Comparison of Technical Analysis and Fundamental Analysis

In fact, these two approaches are intended to solve the same problem as a prediction method, in other words, these two approaches aim to determine possible changes in the direction of prices. However, both are approaching the problem from different points of view. While fundamental analyst's opinions focus on the causes of price movements, technical opinion focuses on results.⁷⁴

Major difference between two methods comes in here. Fundamental analysts explore the reasons that may affect prices for finding the real value of a stock. Fundamental analysts have analyzed macro-economic, sectoral, political and many social factors conjunction with many financial data which is related to company. As it is understood from here, fundamental analysis requires knowledge that individual investors can not easily overcome. At the same time, to achieve so much information in time and to follow constant the information's change are inconvenient occupations. On the other hand, according to technical analysis investigation of the information, it is not essential because technical analysis accepts all of this information reflecting demand and supply then reflecting prices. These informations are already in price so there is no need to examine. Therefore, work of technical analyst will be to examine price charts.

Although; fundamental and technical analysis approaches can be used both on the concept of which stock is selected, buying and selling points of stock, in the other words, scheduling matter requires a completely technical approach. Therefore, even if stock selection is decided with fundamental analysis, application of technical principles will become indispensable on the some stages of the process.⁷⁵

Another difference between fundamental analysis and technical analysis is; that fundamental analysis has got medium and long term perspective, and on the other hand, technical analysis is a short-term approach.⁷⁶ The logic of fundamental

⁷⁴ J.J. MURPHY, *op.cit.*, p.5.

⁷⁵ J.J. MURPHY, *op.cit.*, p.7.

⁷⁶ C. AKMAN, *Bireysel Yatırımcının Rehberi*, 1st Press, İstanbul: İletişim Yayınları, 2001, p. 147.

analysis is to take low-valued stock and retain it until the stock finds the real value. This often requires a long-term approach. Technical analysis is used for gain by taking the advantage of short-term price movements. In addition, technical analysis is an important component of a disciplined buying and selling.⁷⁷

One of the other advantages of technical analysis is that; it simultaneously monitors a large number of different markets and it can enter in the other investment tools. Global stock and bond markets, currencies, stock sectors, individual stocks, bonds and commodities can be traced easily. In addition, principles of technical analysis can be applied to all of these markets; in the bargain do not much information about basic data of these markets.⁷⁸ Fundamental analysis is not possible to use too much area for individual investors, due to a number of temporal factors, the problem of access to data in time and a majority of examined data.

Common point of fundamental analysis and technical analysis is that both are essentially subjective, in other words, results of analysis can be different from according to investors. On the fundamental analysis discount rate can be found in different by investors and the results can vary from person to person. On the technical analysis each investor can find different formations, support and resistance points in the same chart, in brief investors may interpret different graphs. This situation causes to different investment decisions for the same stock in terms of both technical and fundamental analysis.

2.5.Traditional Portfolio Theory

When more than securities are brought together, they created a new financial asset. Creating a financial asset in this way is called portfolio.⁷⁹ Security portfolios do not have the characteristics of securities owned by them all the time. Traditional

⁷⁷ S. NISON, **Japanese Candlestick Charting Techniques**, New York: New York Institute of Finance, 1991, p.9.

⁷⁸ J. J. MURPHY, **Görsel Yatırımcı**, Ali Perşembe (çev.), 1st Press, İstanbul: Scala Yayıncılık, 1998, p.28.

⁷⁹ A. CEYLAN, T. KORKMAZ, **“Borsada Uygulamalı Portföy Yönetimi”**, 3rd Press., Bursa, Ekin, 1998, p.123.

portfolio theory aims to distribute the risk to more than one security. Risk distributing in this way is called lean diversification and this expression can be explained as “Refusal of all the eggs in a basket”.⁸⁰

A portfolio, which is consisted of a greater number of securities, is better diversified than a portfolio which is consisted of a fewer number of securities, but the relationship between the returns of securities are not be considered as a traditional portfolio theory. Portfolio risk will be reduced when numbers of assets, which are taken in portfolio, are more than more.

2.4. Modern Portfolio Theory

A portfolio selection method can be divided into two phases. The first stage starts with observation and experience, and ends with opinions about the future performance of existing securities. The second stage begins opinions about future performances and ends with the selection of portfolios.⁸¹

According to Harry Markowitz, known as the pioneer of modern portfolio management, non-systematic risk can be reduced without a decrease in expected returns, in case of taken securities which have not exactly a positive correlation between returns on the investment portfolio.

The basic assumptions of Modern Portfolio theory are as follows:⁸²

- a) Market is efficient
- b) Investors think rational, aim to maximize and well-beings of investors have diminishing marginal utility.
- c) Estimates of investors’ risk are proportional to the expected change in return.
- d) Investors take to investment decision only according to expected return and risk.

⁸⁰ G. KARAŞIN, **Sermaye Piyasası Analizleri**, Ankara, CMB Publications, 1987, p.101.

⁸¹ H. MARKOWITZ, “Portföy Seçimi”, Çev. Ahmet Kandemir, **Finans Teorisinin Temel Makaleleri**, Ed. Prof.Dr. Cengiz Erol, Ankara, CMB Publications, 1998, p. 451

⁸² G. KARAŞIN, **op.cit.**, p.107.

- e) Investors have same time horizon on their investment.

2.5. Behavioral Finance

Behavioral financier indicates that general of people and investors are not fully rational. However it is not propounded that not all investors are irrational instead of this, it is said that there is a strong tendency. Investors take an action according to rumour rather than knowledge. According to this method, investors are followed by the financial guides, they are unable to diversify, they actively take an action and change to their portfolios, they increase to tax obligations by sell winning stocks and holding to the losing stocks, they manage costly to investment funds and they followed by stock price movements and other popular models.⁸³

The areas, which have individual deviations from rationality, are addressed in three parts. These are: attitudes towards risk, non-Bayesian expectation formation and presentations from different frames of the same decision problem.⁸⁴

Loss aversion and narrow framing are important factors in determining attitude toward risk. The degree of loss aversion depends on prior gains or losses. In sequence two losses create a bigger problem on person, while losses, which are followed by previous earnings, are creating a less stress.

Mental accounting refers to how people evaluate financial transactions and how people process of thinking. The degree of loss aversion depends on the mental accounting. People pay attention to gains and losses in a narrow sense. They do not pay attention to change the level of total wealth. When investor looks to total portfolio performance instead of one single stock, if the portfolio performance is well, investor will be less regretful and sorrow.

⁸³ S. DÖM, *op.cit.*, p.7.

⁸⁴ S. DÖM, *op.cit.*, p.8.

Individuals disobey to Bayes' Rule and the principles of probability while they systematically make decision under uncertainty. Rather they make a decision according to a limited number of heuristic principles.

Finally, presentations from different frames of the same decision problem affects to individuals' choice. While investors, who find Risk of short-term variability of returns of stocks, are avoiding to taking stock, they invest to stocks when they compared to long-term returns with bond returns.

2.5.1.Heuristics

Heuristic can be defined as strategies or shortcuts that can be applied on problem-solving but not always provide right solution. Such errors are caused by prejudice.

2.5.1.1.Representative Heuristic

It can be defined as investors associate the concept of good stocks with good and profitable companies and they avoid refraining from investing the bad and loss companies by ignoring to companies' potential return. There is not any rule for good companies would have more profits than other companies.

2.5.1.2.Availability Heuristic

It can be described as a short-cut that based on striking and quick to remember and an event of probability referred to memory liveliness. One thing comes to mind quickly, people assume that this thing is very common. It is an example that, increase in doing of earthquake insurance after the earthquake which is new even

2.5.1.3.Adjustment and Anchoring

Individuals often decide to by taking as a reference to determined initial value and making a correction on this. When estimate is demanded for humans, people took the reference point and they make an adjustment above or below this point.

2.5.1.4.Overconfidence

Individuals suggest on their own knowledge and skills to be superior to other individuals. It is observed that because of over confidence, individuals predicted their knowledge is overload and their risk is low and they overrate to skills to control events. People connect to good results related to their own but bad results related to external factors and bad luck. It is less diversified that overconfidence cause to investors' carrying portfolio.

2.5.1.5.Optimism

Most of the people see themselves above the average and they perceive themselves better than others. While investors estimated the return on their portfolios is over than the return of stock exchange, realizations are lower than on the basis of both the portfolio and the index. Excessive optimism can be explained people play games of hazard which are probability of winning is very low.

2.5.1.6.Regret Aversion

Regret shows itself in the form of hurrying selling to stocks which are moved into profit, on the other hand, holding to stocks which are damaged. When an investor, who is in need of cash, is in the position of selling one of the two stocks in his portfolio, he proud of selling to stock which is risen in value, by contrast, he avoids regret by preferring to wait to stock which is fallen in value.

According to Festinger, “when you make a choice, it means that you loss objectivity any more”. “I have waited thus much, I do not give up any more” approach, which could be defined as increasing dependence trap, causes to miss the

opportunity to recover from loss at the start of loss. Warren Buffet said that “If you want to get out of an excavation, the best thing is that you can give up digging” and indicates the importance of stop-loss strategy.⁸⁵

2.5.2. Investor Sentiment

In some cases investors show overreaction by buying to winning stock whereas by selling to losing stocks. Sometimes they show to under reaction. In such a case prices should have been rapidly moving away from real value. Rational investors draw to prices, which should be real level, by taking place in the opposite side of the processes. Under reaction result from investors who do not improvement and correction of their estimates.⁸⁶

2.5.3. Herding

Herding can be defined as investors taking action at the same time, at the same stock or the market and at the same direction (buy or sell). If an investor makes a decision or change own mind by looking at the other investors’ decision, it means that the investor is attending the flock. Herding is divided into two categories as rational and irrational herding.

Individuals observe behavior of the other individuals who are previous of him and individuals act with gained knowledge. Subsequent individuals create a herding by following or imitating to behaviors of anterior individuals. Irrational herding can be explained by social pressure and fashion. Individual, who is learned to other individuals’ investment decision, will inevitably find himself in a consensus. This consensus how quickly makes and performs the decision, herd effect is so active.⁸⁷

⁸⁵ A. ÖZEN, “Yürekten Bağlılık: Nereye Kadar?”, **PİVOLKA**, Year:3, No:14, Year:2004, p:15- 17. (On-line documentation) <http://www.elyadal.org/pivolka/14/baglilik.htm>. 10/10/2010

⁸⁶ F.M. WERNER, D. BONDT, R. THALER, “Does The Stock Market Overreact?”, **The Journal Of Finance**, Vol. 40, 3, July 1985, p. 793-805.

⁸⁷ S.DÖM, **op.cit.**, p.142.

William J Bernstein recommends a summary of these guidelines about financial behavior in his “The Four Pillars of Investing” book: ⁸⁸

- Stay away from held which are kicked up a row. If you do not stop, you chew and dirty. The traditional reasoning is often incorrect.
- Avoid believing too much on yourself. Most likely, you are buying and selling with people who are more informed, faster and better equipped than you. Do not think you can win this game by taking advantage of buying and selling rule and a few simple stock selection strategies or by reading a stock market newsletter.
- Do not be affected too much by the last five or decennary performance of an asset. Asset, which is lost within the last decade, is more likely to win in the next ten years.
- Try not to worry too much in the face of short-term losses. Instead of focus on long- term gain by making diversity as much as possible.
- Market tends to do over-assessment to growth shares, this leads to low returns. Stocks of good companies do not necessarily higher returns.
- Do not focus on your portfolio components, but focus on your portfolio as a whole. Calculate the overall return on the portfolio every year.

⁸⁸ W. BERNSTEIN, *Yatırımın Dört Temel Taşı – Kazandıran Bir Portföy İçin Dersler: Tarih, Psikoloji, Teori ve Pratik*, İstanbul, Scala Yayıncılık, January 2005, p. 262.

PART III

TECHNICAL ANALYSIS

3.1. The Concept of Technical Analysis

An effort to predict the future direction of the stock price and thus, appropriate time for a stock buying and selling has been one of the most persistent efforts of individual. Today, especially in developed countries people can be found who are tried to guess the stock prices by fairly complex econometric models which are taken into account the many economic and social variables. Apart from that, people can be found who are tried to guess the stock prices by evaluating land points in the sun or looking at the movements of moon.⁸⁹

Technical analysis is a method that is usually used as a graphing recording to buy and sell price, which are previously taken place in the market, of future contract, index, commodity, currency or any stock, and predicts the possible future trend these data which are belong to past. Technical analysis is a science that is usually used in the form of graphics to make a record of price trading volume and so on information of a particular stock or the index and identifying possible future trends from this information which is made formal in past.⁹⁰

Technical analysts, unlike the fundamental analysts, try to guess stock price rather than the value of stock. For this reason, the technical analysts know the price of each stock but they do not know any stock value.⁹¹

There are some basic assumptions underlying the technical analysis. These assumptions are as follows:⁹²

⁸⁹ F. ÖZÇAM, *op.cit.*, p.5.

⁹⁰ F. ÖZÇAM, *op.cit.*, p.15.

⁹¹ F. ÖZÇAM, *op.cit.*, p.17.

⁹² F. ÖZÇAM, *op.cit.*, p.17.

- Market value is only determined by the mutual interaction of supply and demand.
- Supply and demand are affected by a lot of both rational and irrational factors.
- Stock prices tend to move in trends without the effects of small fluctuations in the market on the sufficient lengths of time.
- Shifts in supply and demand lead to changes in trends.
- Whatever the reason is, supply and demand shifts can be determined on charts.
- Some graphic examples tend to repeat and these repeated examples can be used to predict the price movements.

Community psychology should be examined due to investors, who invested in stock; and are within the financial community. Community behavior can be estimated while individual behavior can not predicted easily.⁹³

An investment decision is being achieved by various analyses. But, then the price movements control the investment decisions and mostly non-rational investors correspond to price movements. Investor is in the sense of happiness, if the price goes in favor their own but if the price goes in the opposite direction, investor is in a sense of dissatisfaction (fear, anger, depression, anxiety etc.)⁹⁴

3.2. The Advantages and Disadvantages of Technical Analysis

Using the technical analysis method provides a number of advantages or disadvantages as compared to the other stock valuation methods. Here are some of the advantages of technical analysis method:⁹⁵

⁹³ F.ÖZÇAM, *op.cit.*, p.17.

⁹⁴ F.ÖZÇAM, *op.cit.*, p.18.

⁹⁵ A.ERDİNÇ, 1997, *Portföy Yönetiminde Karar Alma Aracı Olarak Teknik Analizin Kullanımı*, Postgraduate Thesis, Istanbul University Institute of Social Science, p. 27.

- Technical analysis provides advantage to investor in terms of time because technical analysis uses data such as price and trading volume rather than complex financial information on a firm or a branch of industry.
- Due to the rules of technical analysis a lot of investment tools such as stocks, bonds, mutual funds and options can be implemented, technical analysis offers diversity to its investors.
- Timing factor becomes important for valorized stock and technical analysis is used to determine this timing factor.

Here are some of the disadvantages of the technical analysis method:

- Past price formations or variables in the creation of movements can not repeat themselves.
- A price formation or work efficiently of technical analysis method put out of commission with the application of the theory and doing same things by the everyone in the market.

3.3. Dow Theory

3.3.1. History of the Dow Theory

Dow Theory, which is recovered by compiled to Charles Dow's articles that was published between 1900 and 1902 in The Wall street Journal Newspaper, is the oldest technical analysis method and it is the most of done to research publication about the technical analysis.

The aim of the theory is to correlate the stock market direction (trend) with the general course of business, try to predict the general direction of the stock market by ignoring short-term price movements, and thus, take a place to the right side of the determined trend at the right time.

According to Dow Theory, the majority of the stocks watch to trend which is based on the market. To define stock market topic, Charles Dow described two indexes in 1897. Industrial Average which was consisted of 12 industrial companies'

stocks and the other index is Railway Average which was consisted of 12 railway companies' stocks. The name of Railway Average can be changes as Transportation Average after the transportation sector was included land and air transport.⁹⁶

The underlying cause of the creation of DJIA (Dow Jones Industrial Average) and DJTA (Dow Jones Transportation Average) indexes is that these two sectors are independent of each other but at the same time they are related to each other because of their area of activities. Companies which are placed in manufacturing sector, must take the advantage of transport sector due to deliver their products to the market; therefore, positive developments that may occur in the manufacturing sector will positively affect the transport sector. If the sector shows the better performance at another sector, it will be seen to move away from trends of indexes.⁹⁷

Charles Dow's other studies with this principle developed and edited by William Peter Hamilton and Dow Theory is created first in the early 1900s. After the William Peter Hamilton, Robert Rhea published a much more integral and a regular source which is called "Dow Theory" in 1932.⁹⁸

3.3.2. Basic Principles of the Dow Theory

The basic principles of the Dow Theory are collected under six main headings. These are as follows:

3.3.2.1. Averages Discount Everything

Average, which is mentioned in here, is an index that is taken the general of market soundings. Index is the average market price and it is reflected as a price to the charts. Past, what are happening now and the prospects for the future, in short, all available information is reflected in the prices. Price represents the sum of all market

⁹⁶ A.PERŞEMBE, **op.cit.**, p.36.

⁹⁷ A.PERŞEMBE, **op.cit.**, p.36.

⁹⁸ A.PERŞEMBE, **op.cit.**, p.36.

participants' hopes, fears, ambitions and expectations. Therefore, the price can be determined by understanding the strategy.⁹⁹

3.3.2.1. There are Three Basic Trends in the Market

Dow's this principle there is an upward trend, if each high-value and low value occurs higher than the previous high value and low value. In other words; upward trend should be appearance to raising hills and bottoms. On the contrary, downward trend is observed falling hills and bottoms. In other words, length of ride up is shorter than length of come down and main flow is downstream.¹⁰⁰

Dow has made three separate trend definition:

- **Main (Major) Trend:** The main (primary) trend period is generally longer than a year. This trend, which is also called as upward bullish market and downward bear market, is a long term rising and falling movements that significant increases and decreases occurred in prices.
- **Secondary (Intermediate) Trend:** The secondary trends, which grow at the opposite direction to main trend, usually continue one or few months. These are defined as the reactions of main trends.
- **Small (Near-Term) Trend:** These trends which very rarely can be reached after a very few weeks, are described as meaningless price movements by Dow. This is open to manipulation because of the short duration and naturally, their results may be deceptive.¹⁰¹

⁹⁹ A.PERŞEMBE, **op.cit.**, p.37.

¹⁰⁰ T. KORKMAZ, A. CEYLAN, **op.cit.**, p.307.

¹⁰¹ A. ÖZEKŞİ, **op.cit.**, p.13-14.



Figure I Trend Types According to Duration

Source: F. APAYDIN, 2009, **Teknik Analizde Optimizasyon Uygulaması ve Bu Uygulamanın İMKB Üzerinde Test Edilmesi**, Postgraduate Thesis, Marmara University Institute of Social Science, p. 17.

At the chart above, bullish market can be seen clearly between 2003 and 2007 on the ISE-100 Index. Long line which is signified with A, took nearly four years. The other lines which are signified B, C, D and lived ranging from two and four months, are shown the secondary trends that formed opposite direction to main trend. There are a lot of trends, which are small and placed in both the main trend and the secondary trends, are represented to daily fluctuations.¹⁰²

3.3.2.2. Main Trends Consist of Three Stage

According to Dow Theory, both bullish market and bear market occur in three stages. A bullish market phases are as follows:

The first stage is a recovery stage. Recovery stage, which is the first phase of bullish market, is unlikely to distinguish the last stage of bear market. Bad financial

¹⁰² F. APAYDIN, *op.cit.*, p.17.

statements, which are generated on distressed market conditions, are prevented the participation of broad masses and stocks are dealt niggardly. However the limited number of conscious investors, which are described as “smart money”, begins to take this stage due to their long-term positive expectations.¹⁰³

The second stage is the attendance stage. At this stage; prices start to climb up, economic conditions and expectations start to improve and company profits begins to rise. Large mass, which is not found to reassure coming purchase from recovery stage, participate to the market due to this rapid rise. Also known as a trend follower enters the market areas at this stage.¹⁰⁴

The third stage is exaggeration and distribution stage. At this last stage everything is cakes and ale. Promising economic prospects and high company profits are thought to target a much more upward trend and there is a long way. Increase in prices are directed to everyone to the market and they are realized a high level of trading volume. At this stage, the same as in the first stage, prices are moving away from their add value. At this point the smart money starts to realize profits.¹⁰⁵



Figure II The Stages of the Bull Trend

¹⁰³ A. PERŞEMBE, *op.cit.*, p.47.

¹⁰⁴ A. PERŞEMBE, *op.cit.*, p.47.

¹⁰⁵ A. PERŞEMBE, *op.cit.*, p.47.

Source: F.APAYDIN, *op.cit.*, p.20

At the chart above, three stages of a rising trend is observed easily between 1998 and 2000 in the ISE. The region, which is stated as 1, shows the recovery phase of a bull market; the region which is stated as 2, shows the participation stage and the region which is stated as 3, shows to exaggeration and distribution stage that is the final phase of bull market.¹⁰⁶

3.3.2.3. Averages Must Approve to Each Other

Dow says that averages must be approved to each other. In terms of Dow, the main importance of this, this is used to crosscheck whether rising or falling trends are finish or not on the trend changing points.¹⁰⁷

3.3.2.4. Trading Volume Approve to Trend

Dow regards trading volume as a secondary but an important factor; in terms of approve the price signals. Simply put, trading volume should increase in the direction of the main trend. Trading volume increases with the rising prices and it decreases with the falling prices on the main upward trend. On the other hand, trading volume should increase with price declines and it should decrease with price rising on the main downward trend. Technical analysts compare the trading volume with the price movements too see, whether they approve or not each other.¹⁰⁸

Final signals about the existing trends in the market are produced by analysis of price movements on the Dow Theory. Trading volume, as a secondary proof, helps to explain suspicious circumstances.¹⁰⁹

Dow indicates that high trading volumes can point to the possible returns from the trend. Days with the high trading volume, which is consisted after the price

¹⁰⁶ F.APAYDIN, *op.cit.*, p.20

¹⁰⁷ A.ÖZEKŞİ, *op.cit.*, p.19.

¹⁰⁸ J.J.MURPHY,1999, *op.cit.*, p.27.

¹⁰⁹ R.D.EDWARDS, J.MAGEE, *Technical Analysis Of Stock Trends*, Eight Edition, Florida: CRC Press LLC, 2001, s. 21.

falling or price rising that are continued for a while, may be precursor the come to an end of continued trend or it may be precursor of at least one corrective action.¹¹⁰

3.3.2.5. The Current Trend is Valid until the Turn Signal

According to last assumption of Dow Theory, to say end of the current trend, it must ensure that the turn signal is received. Turn signal is related to definition of averages and trends which are previously described. For example it is expected that bull market makes a new high hills or bottoms. If the bull market doesn't make a new hill or consisted bottom occurs under the previous bottoms, we can say that there is a turn signal. For the confirmation to turn signal, these situations should be continued. Otherwise, the validity of trend will be continued because turn signal is couldn't confirmed.¹¹¹

The same situation is valid for bear market. The expectation is that, market makes to the new lowest or hills are consisted more below. If the bottom or hill occurs to more above, this is a turn signal. For the confirmation of signal, other averages similarly should be making more above hill and bottom.

3.3.2.6. Criticisms to Dow Theory

Many criticisms were made in time for the Dow Theory. The concentrated point of these criticisms is that Dow Theory is given too late signals that are showed the start or end of main trend. Even if this criticism is partly justified, at the same time this is strident criticism. Due to late receipt of the signals, with a rate of twenty or forty percent of a trend is overlooked. However, Dow Theory is not a claim that to catch the trends on the bottom and top points. In addition, there is not any analysis technique which is given more positive results on the concept of capturing the trends.

The second point of criticism about the Dow Theory is that, theory is not help to short and medium term investors. This is a correct criticism because; theory either

¹¹⁰ A. PERŞEMBE, *op.cit.*, p.49.

¹¹¹ A. PERŞEMBE, *op.cit.*, p.50.

gives a very little signal or does not any signal about the medium-term trends.¹¹² There are two main reasons for this. First, the minor trends (and sometimes secondary trends) can be easily manipulated, for that reason theory is not interested in short-term price movements. The second is the opportunity of gain is limited for minor and secondary trends.

The third criticism for the Dow Theory is that, theory doesn't make it clear for the concept of which stock should be taken. The aim of the theory already is determined by the general trend of the market. It is indicated that stocks will be requested to follow the general trend. In addition, Dow Theory is not a study which focused on the selection of stocks. To use of different analysis techniques would be more useful for investors on the selection of stocks.

3.4. Charts

Technical analysis is an analysis method which is tried to predict the future direction of prices by analyzing past price movements. Therefore, the main material of the technical analysis is the past price movements. The most convenient way to make this material is the creation of a chart which is shown the price data on a plane. Price movements of stocks within a day, formations that have created these price movements, directions of movement, the numbers of their trading can be examined only by favor of these charts. For the creation of these charts, closing price, opening price, maximum and minimum price, and weighted average price data is needed.¹¹³

Graphics are shown on a two-dimensional plane. While the traded stock price is on the vertical axis, the time slicing is on the horizontal axis. If needed, data about trading volume is expressed by vertical lines usually at the bottom of the chart.

¹¹² F.ÖZÇAM, **op.cit.**, p.36.

¹¹³ H. ÇAĞIRMAN, **Finans Piyasalarında Bermuda Şeytan Üçgeni**, 1st Edition , Ankara: Siyasal Kitabevi, 1999, p.15.

3.4.1. Types of Scale in Charts

While horizontal axis, which shows time slicing, always expressed at equal intervals; the vertical axis, which shows price, is denotable as the arithmetic and logarithmic. The main difference between them is a form of computation price range on the price axis.¹¹⁴

3.4.1.1. Arithmetic Scale

On the arithmetic scale, the distance between each unit price that is placed in the vertical section of the chart, is shown as an equal. In this case, the distance between 200 and 300 with the distance between 200 and 300 will be equal to each other.

Technical analysis often uses in arithmetic charts. Disadvantage of this situation is chart analysis at long term and especially within a short period of time, analysis of stock charts, which are showed in excessive increase, makes difficult to see the details of the lower time slicing.



Figure III Arithmetic Scale

Source: F.APAYDIN, *op.cit.*, p.25.

¹¹⁴ A. ÖZEKŞİ, *op.cit.*, p.38.

3.4.1.2. Logarithmic Scale

The distance between each unit of price that is placed in the vertical section, is not equal on the logarithmic scale. Distances are identified according to the percentage changes between prices. For example, when the stock price is raised from 100 to 200, there is 100% increase, as similar to if the stock price is raised from 200 to 300, there is 50% increase. It means that, the difference between is not shown as absolute value but it is shown as percentaged. For this reason, differences between 100 and 200 will be two times the differences between 200 and 300. As a result of this, logarithmic scale makes possible to a more detailed examination due to demonstrate to lower price segments a wider range.

In general, intended uses of logarithmic charts are as follows:

- Measure the pace of market
- See more detail to historical data
- Make a too long-term analysis.¹¹⁵



Figure IV Logarithmic Scale

Source: F.APAYDIN, *op.cit.*, p.26.

¹¹⁵ A.PERŞEMBE, *op.cit.*, p.68.

3.4.1.2. The Chart Types

In technical analysis; different types of charts which are reflected on prices, are used. This difference is arisen from information content that charts are often provided by users. Most commonly charts that are used in technical analysis are as follows:

- Line Chart
- Bar (Bar) Chart
- Candlestick Chart
- Point and Figure Chart.¹¹⁶

3.4.1.3. Line Chart

Line charts, as the name implies, are created as a result of line joining of closing prices which are worked on hourly, daily, weekly or monthly period. Line charts have limited use because of they didn't give any other information without the closing price of stock. Even though long term analysis don't needed to known of daily fluctuations, for short term analysis price fluctuations have importance within a day. For these reasons, line charts are not preferred much.¹¹⁷

¹¹⁶ A.PERŞEMBE, *op.cit.*, p.58.

¹¹⁷ L. STEVENS, *Essential Technical Analysis*, New York: John Wiley & Sons, 2002, p. 61.



Figure V Line Chart

Source: F.APAYDIN, *op.cit.*, p.28.

3.4.1.4. Bar Chart

Bar charts which are one of the standard tools of technical analysis, are perhaps the most widely used chart form. Bar chart concept is actually simple. Horizontal axis represents time and vertical axis represents price level. A single bar in bar chart shows the highest and lowest level range of prices within the time period. Small horizontal line which is the left side of the bar, determines the opening price. Other horizontal line on the right side determines to closing price.¹¹⁸

¹¹⁸ J. L. PERSON, **Technical Trading Tactics**, First Edition, New Jersey: John Wiley & Sons, 2004, p.35.



Figure VI A Bar Chart View

Source: <http://www.investopedia.com/terms/b/barchart.asp> (23.10.10)

Bar charts provide much more information about the stock analyst. They are more preferable because it is convenient to do short-term analysis. On the bar charts, if the closing price closes the vicinity of lowest region within a day, it represents technical weakness and excess of sales pressure. On the contrary, if the closing price closes vicinity of the highest region within a day, it represents stocks are technically stronger and buyers are willingly to take stocks.¹¹⁹

Technical analysts try to understand whether very short-term trends continue or nor by examining several successive bar chart. If the highest bar with the lowest bar is higher than previous the highest bar and the lowest bar, this situation is made a comment in the form of that trend will continue. Otherwise, it is perceived as a signal that trend is return.

¹¹⁹ Y. SARI, *Borsada Grafiklerle Teknik Analiz*, 3rd Edition, İstanbul: Alfa, 1998, p. 15.

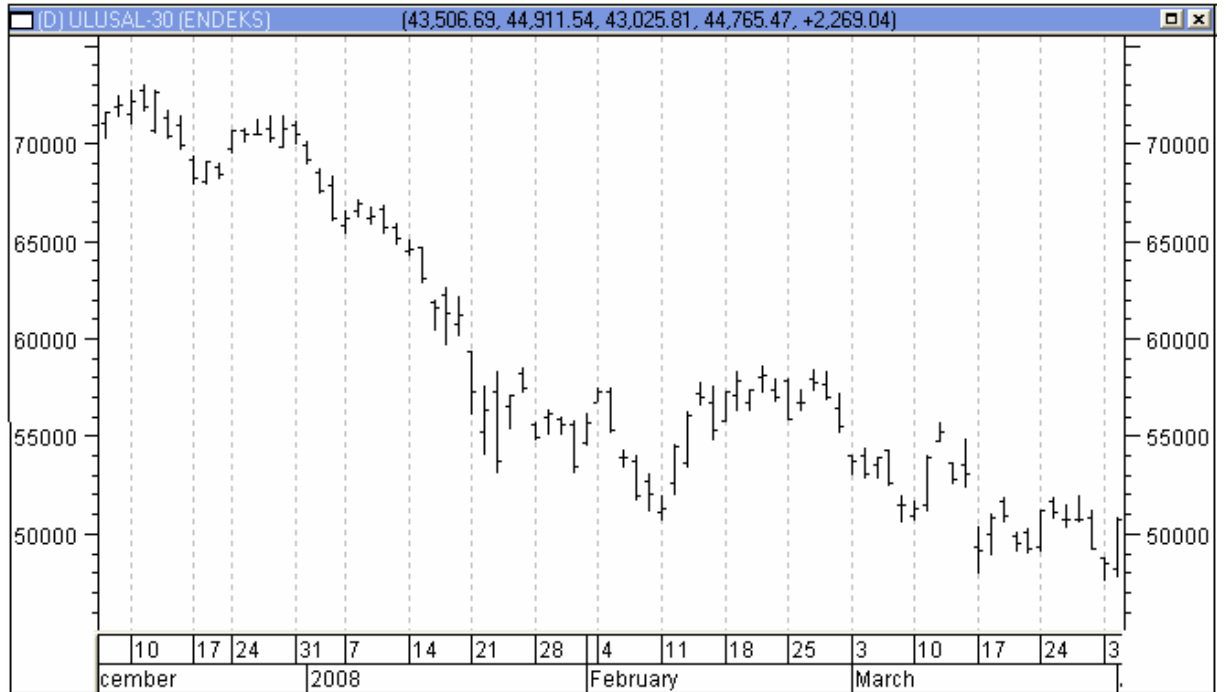


Figure VII Bar Chart

Source: F.APAYDIN, *op.cit.*, p.29.

3.4.1.5. Candlestick Chart

A bar chart and a candlestick chart are created by using the same price data. Even though daily bar chart and candlestick chart use the same data, it is not difficult to see that they are drawn in a different way. A thick part of the candle is called “body”. Body refers to interval between opening and closing price of a day. When the body is black, closing price is lower than opening price. If the body is white, it means that the closing price higher than the opening price. Thin lines at the bottom and upper of the body are “shadows”. These shadows refer to tip prices of the day. The top of body is called as “upper shadow” and under of the body is called as

“lower shadow”. Therefore, the highest of the day is the upper shadow, and the lowest shadow is the lower shadow.¹²⁰

Candlestick charts, as described above, consist of a body and a bar through the center of the body. To be drawn the candlestick chart, four price data are required which is mentioned above. In the absence of the opening price, closing price of a previous day is used.

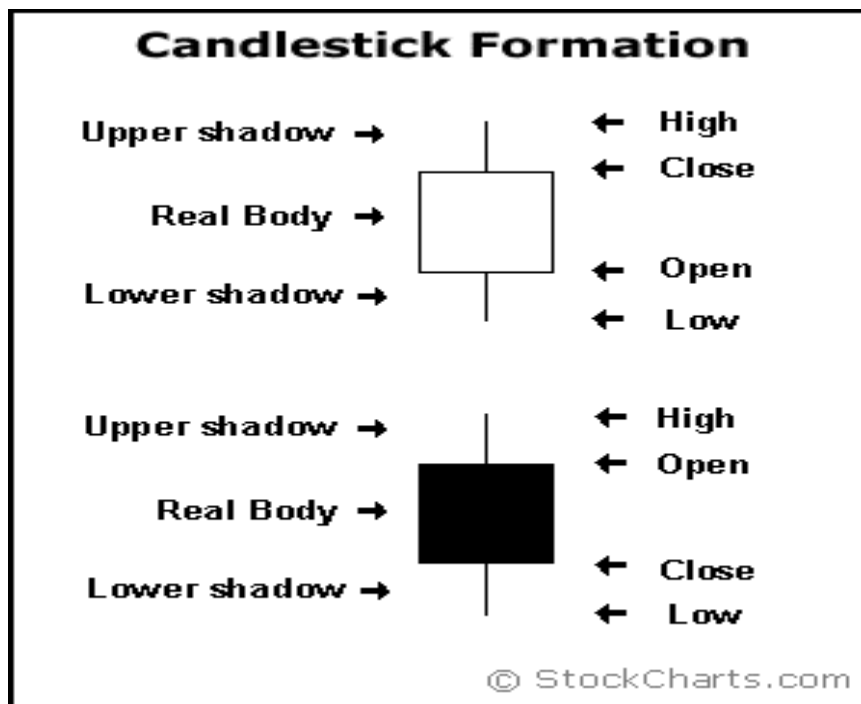


Figure VIII Candlestick Formation

Source: http://stockcharts.com/school/doku.php?id=chart_school:chart_analysis:introduction_to_candlesticks
(23.10.10)

If candlestick chart is compared with bar chart, it can be seen that there aren't any differences between them. Candlestick chart explains price data more sharp and clearly.¹²¹

¹²⁰ S.NISON, *op.cit.*, p.21-23.

¹²¹ G. L. MORRIS, *Candlestick Charting Explained*, U.S.A: McGraw-Hill, 2001, p. 7.

Interpretation of candlestick charts is the same as the interpretation of the bar charts. If the closing price is close to the highest level of the day, it signs to pressure of buyers. If the closing price is close to lowest level of the day, it signs to pressure of sellers.

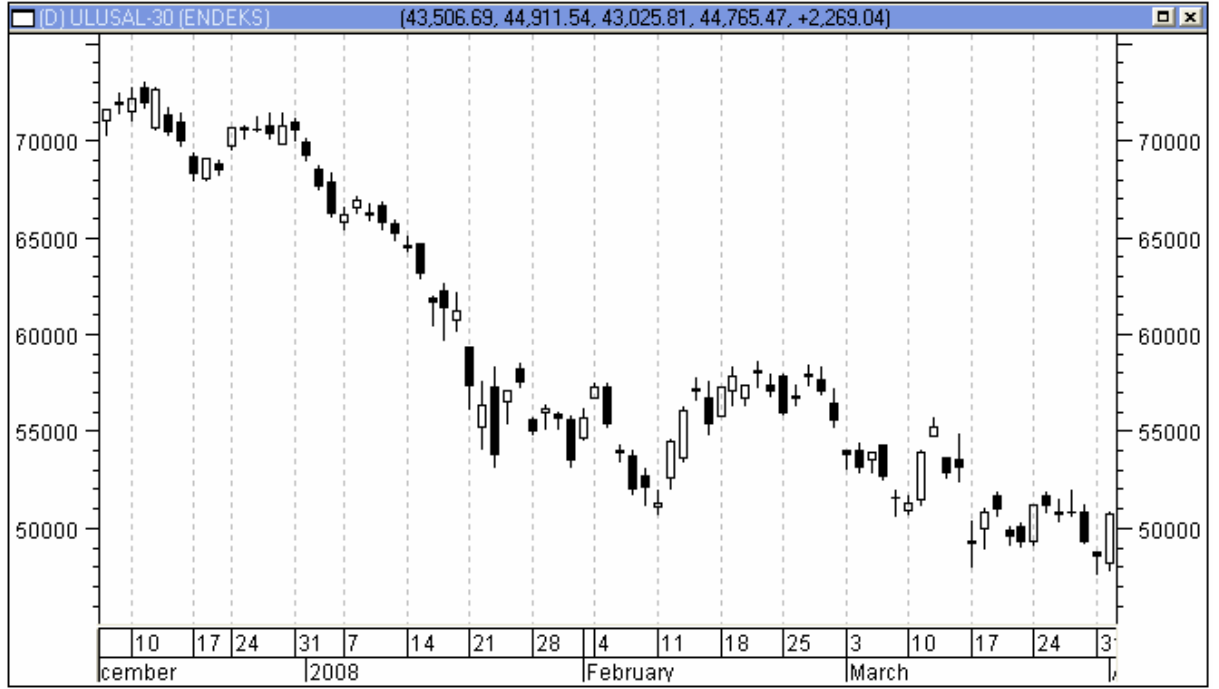


Figure IX Candlestick Chart

Source: F.APAYDIN, *op.cit.*, p.31.

The other chart form of the candlestick chart is “candlevolume” charts. This chart type are provided to trading volume together with opening price, closing price, the lowest and highest price of the day. Transaction volume information is related to width of the candle body. As candle body is larger so trading volume is larger. Narrow body refers to low trading volume.¹²²

Interpretation of candlevolume charts is similar to candlestick charts. But there are some differences due to candlevolume charts are used to trading volume.

¹²² Y. ERDİNÇ, *Yatırımcı Ve Teknik Analiz Sorgulanıyor*, İstanbul: Siyasal Kitabevi, 2004, p. 206–208.

Narrow and long candlesticks show the movement of prices will continue the same direction. Thick and small candlesticks indicate trend will be change.¹²³

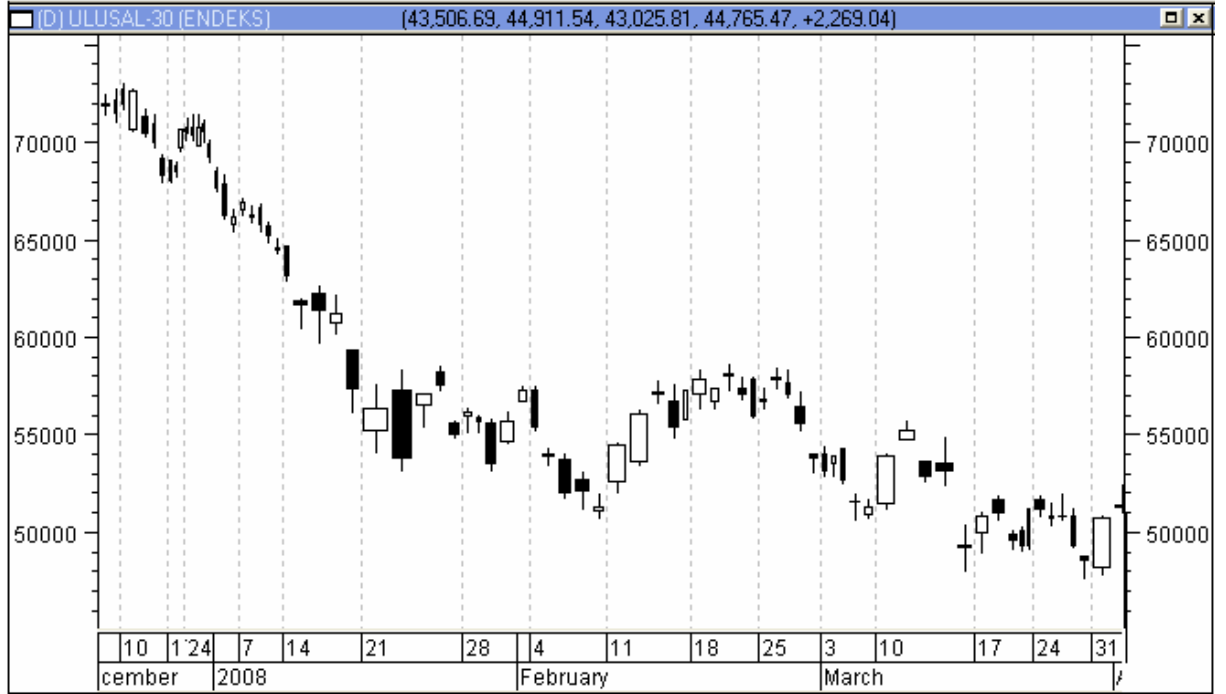


Figure X Candlevolume Chart

Source: F.APAYDIN, *op.cit.*, p.32.

3.4.1.6. Point and Figure Chart

Point and figure chart is a type of chart that is used as the least and the most difficult to drawing. This chart is different from the other type of charts. Price changing according to time is a matter of other charts but, this chart does not take into account the time.¹²⁴

This graph is created with the drawing to price rising on the vertical axis with X signifying at the upstream, and this graph is created drawing to price falling again on the vertical axis with the O signifying at the downstream. The disadvantage of this chart is, it doesn't show trading volume. As long as, price risings or price falling are

¹²³ Y. ERDİNÇ, *op.cit.*, p. 208.

¹²⁴ Y.ERDİNÇ, *op.cit.*, p.185.

continued additional drawing is done on the same column. When the rising price is begun to fall, by passing side column, O sign is placed in the manner that a lower level of the last put the X mark. If the falling price is started to rise, by passing side column, X sign is put in the manner of an upper level of the last put the O signify.¹²⁵

Analyst will put the X when an increase in the price range is up to its own specification, if otherwise, he will put the O sign. In the absence of change to determine price range, it does not intervene to chart.

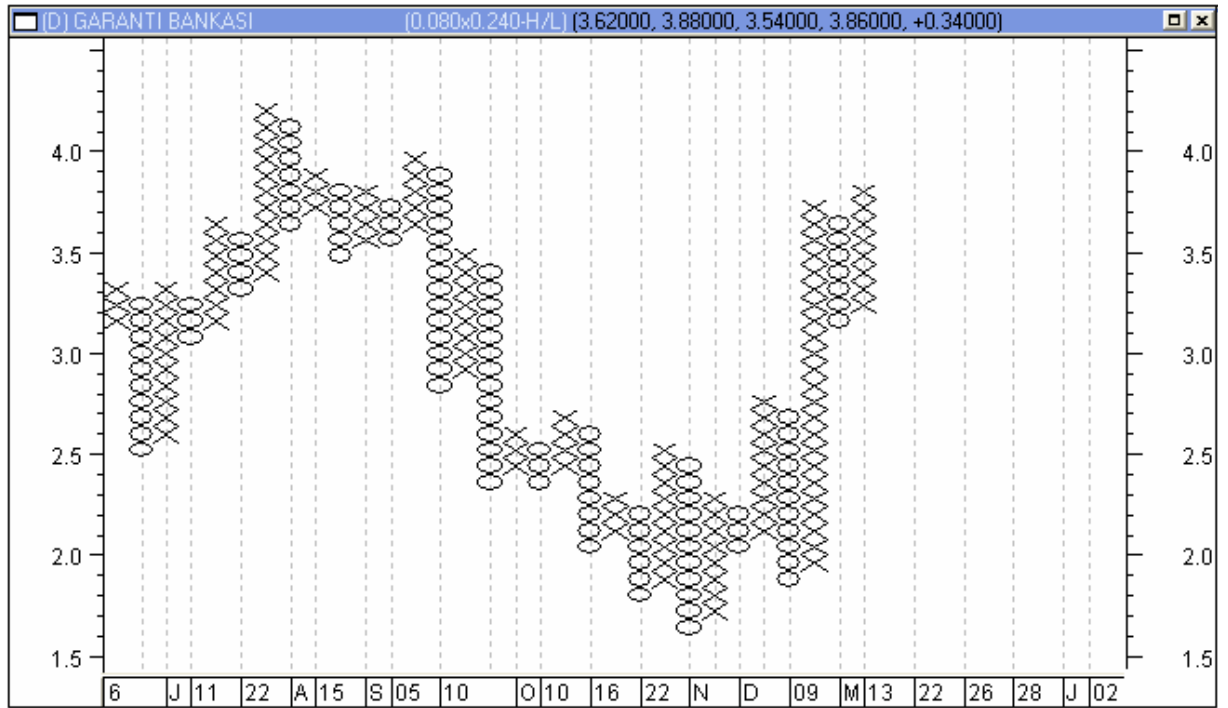


Figure XI Point and Figure Chart

Source: F.APAYDIN, *op.cit.*, p.33.

¹²⁵ H.ÇAĞIRMAN, *op.cit.*, p.43.

PART IV

BASIC CONCEPTS OF TREND

4.1. General Description

According to Dow Theory that is departure point of technical analysis, prices move in trends. So, trends are one of the basic principles of the technical analysis and one of the most put emphasized subjects by technical analysts.¹²⁶ It is possible to say that, the main purpose of all effort of technical analysis and the methods used by technical analysts to find to these trends and to predict how much they will take. According to technical analysts, stocks do not move giddy-paced, in contrast, they proceed by showing a particular organization. In other words, stocks and indices move in the form of obvious trends.¹²⁷

4.2. Trend Classifications and Varieties

In the simplest sense, trend represents to direction of market is gone. Admittedly, any market or any stock price does not proceed in the form of a straight line.¹²⁸ More general sense, trend is direction of prices going with the small differences until the supply and demand equilibrium change with any reason.

Trends are classified in three ways in term of direction. These are uptrend, downtrend and sideways trend. Trends are also classified in terms of time. These are major, intermediate and near-term trends.¹²⁹

4.2.1. Uptrend

Uptrend is a direction of movement that demand is more than the supply, in other words the buyers are dominant in the market, and prices are in tendency to

¹²⁶ M. J. PRING, **Technical Analysis Explained**, 4th Edition, New York: McGraw-Hill, 2002, p.9.

¹²⁷ F.ÖZÇAM, **op.cit.**, p.89.

¹²⁸ J.J.MURPHY, Görsel Yatırımcı, **op.cit.**, p.89.

¹²⁹ C. AKMAN, **op.cit.**, p.187.

upward progression. Uptrend is called as “bull market”. Market indices and stocks tend to rise continuously on the uptrend. Each new peak point, which is consisted of prices, is higher than the previous peak point. At the same time, each bottom level is higher than the previous bottom level. For drawing an uptrend line, at least two bottom points are needed. Uptrend will be determined by combining two or more bottom points. When drawing to uptrend, as bottom level is more so drawing trend is more strong and reliable.¹³⁰ Graphic example of an uptrend is below.



Figure XII Uptrend

Source: <http://www.forextheory.com/technical-analysis/trend-analysis/> (25.10.10)

¹³⁰ Y. SARI, *op.cit.* p.40.

4.2.2. Downtrend

Downtrend is opposite to uptrend. On the downtrend; supply is more than demand, in other words sellers are dominant at the market, and prices are in tendency of constant downward. Downtrend is called as “bear market”. On the downtrend; each new bottom levels are consisted of under the previous bottom level and each new peak point is more below than the previous peak point. To draw downtrend line at least two peak points are needed. Downtrend is determined by combining of two or more peak points. When drawing to downtrend, as peak point is more so drawing trend is more strong and reliable.¹³¹ Graphic example of a downtrend is below.



Figure XIII Downtrend

Source: <http://www.forextheory.com/technical-analysis/trend-analysis/> (25.10.10)

¹³¹ Y.ERDİNÇ, *op.cit.*, p.351.

4.2.3. Sideways Trend

Sideways trend is not a question in terms of technical analysis. In other words, horizontal price movement is not regarded as a trend and the trend does not make a straight line in markets.¹³² Viewing of prices on the horizontal price movement occurs in the form of a horizontal line. Prices on the horizontal price movements fluctuate at a certain price range. These trends or price movements do not continue for a long time for that reason these trends are not subject of analysis in terms of technical analysis. This stage is evaluated on technical analysis as a power collection stage to make prices move up or down. A horizontal price movement also shows market as uncertain. Such as this price movement supply and demand are balanced in general. Periods that are to be of horizontal movements, are named as a congestion period on the market. The following chart is related to sideways trend.

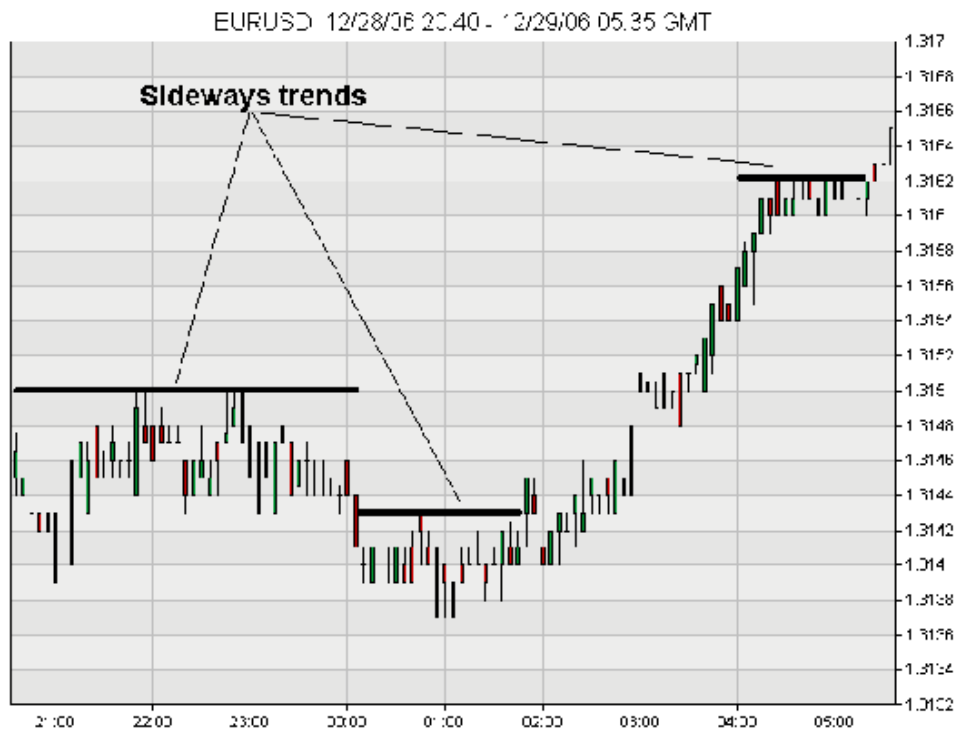


Figure XIV Sideways Trend

Source: <http://www.forextheory.com/technical-analysis/trend-analysis/> (25.10.10)

¹³² J. MURPHY, Görsel Yatırımcı, *op.cit.*, p.33.

4.2.4. Trend Classifications in Terms of Time

Trends are classified in three ways in terms of time. These are, as mentioned in the previous parts, major, intermediate and near-term trends. Major (long-term) trend is a price's downward or upward movement which continues from six months to several years. Major trends are called as main trends. On the major trends, the trend duration varies according to countries and stocks. The second most important trend is intermediate (medium-term) trend. These kinds of trends start at second week and continue to sixth week. Intermediate trend is also called as secondary trend. Intermediate trend moves to oppositely to major trends and this trend occurs to correcting the major trends. The third trend is called as near-term (short-term) or minor trend. These type of trends take a very short time. These trends are daily or weekly price movements. They are phase of correction or consolidation of prices. This type of price fluctuation could be called as price narrowing that is consisted of long or medium-term trends.¹³³

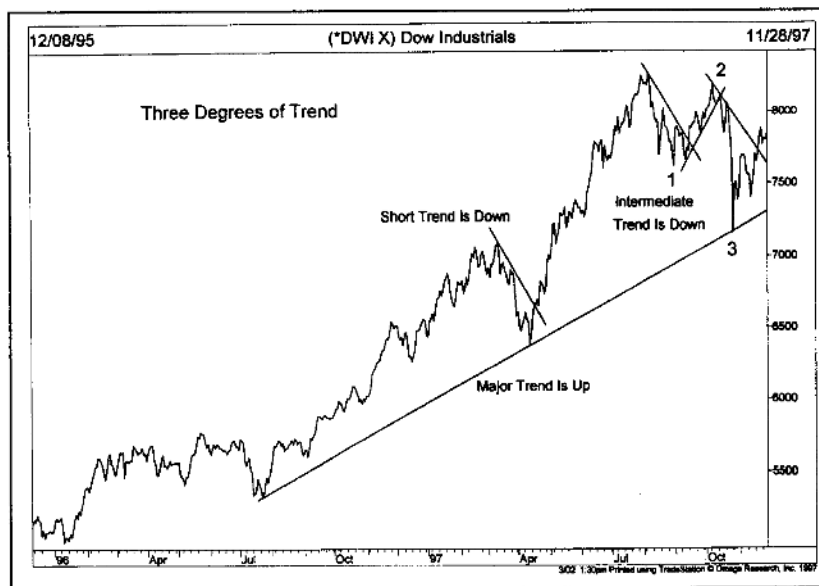


Figure XV Major, Intermediate and Short-Term Trends

Source: MURPHY, John J. Technical Analysis Of The Financial Markets, *op.cit.*, p.54.

¹³³ Y.SARI, *op.cit.*, p.38-40.

The above chart represents major, intermediate and short- term trends. The major trend is during 1997. A short-term trend is during to March and an intermediate trend lasts from August to November.¹³⁴

4.3. Trend Lines

Trend lines are used for identify to course of trend of a stock or a market and to understand the time of trend changing. On the trend analysis, although it is possible to draw a sideways trend line, uptrend line and downtrend line are widely used.¹³⁵

The most interesting characteristics of the trend lines are these; they drawn in the form of a straight line such as drawn with ruler. This tendency is observed clearer on the most of short and medium-term trend. The same way, a long-term trend line can be developed in the form of a straight line.¹³⁶

Trend lines reveal the direction of trends more clear. Trend lines are drawn with a straight line which is passed to bottom or peak points of price movements. To draw a trend line at least two bottom or peak points are needed. On the upward market trend lines pass the bottom level of price movements and on the downward trend lines pass the peak points of the price movements. Uptrend is consisted to combination of at least two bottom points. Uptrend line is raised from left to right. Prices are located on this line. Downtrend line is consisted to combining of at least two peak points. Downtrend line is fallen from left to right. Prices are located under this line. In addition, to drawn a trend line it should be at least two week time differences between two points.¹³⁷

There are some tests to assess whether the trend lines are efficient or not. These tests, also known as efficiency tests, are described below.

¹³⁴ MURPHY, John J. Technical Analysis Of The Financial Markets, **op.cit.**, p.54.

¹³⁵ MURPHY, John J. Görsel Analiz, **op.cit.**, p.42-45.

¹³⁶ F.ÖZÇAM, **op.cit.**, p.90.

¹³⁷ Y.SARI, **op.cit.**, p.40.

- The Number of Upper or Lower Levels: If the numbers of upper or lower levels, which are developed on or very near of the trend line, to be more, it means the further increase the importance of trend line. In other words, to be tested five times to trend is more important and meaningful than to be tested three times to trend. At trend line as more tested so it's reliable and importance is increasing.¹³⁸
- Length of Trend Line: To be long of trend line, in other words, to be continuing long-term without breaking, increasing the technical importance of trend line. Trend lines, which is consisted of two peak or bottom points that close to each other in terms of time, may be erroneous. If the trend line as take a long time, so its validity increases more.
- Trend Line Angle: To be low angle of trend line, in other words; to be developing in the form of more horizontal of trend line, a criterion to validity of a trend line is required. More straight, close to horizontal line trend is more effective as a technique. The importance of break to this kind of trend lines is more important in terms of technical analysis. While breaking of the rectangular trend lines are easier; it can take longer to break the trend lines which are horizontally developed.¹³⁹

It is mentioned that, for drawing a trend line at least with two peaks or bottom line are needed. But in some cases, there may be third and fourth bottom or peak points. In this case, it is required to correct trend lines. The correction is done by breaking to trend line. If prices violate to trend line, create to third peak or bottom points and after, they return to their past trend lines; trend line should be correct with the point that drawn from second point to third point. If the original trend line is previously tested to several time and prices are returned to this point; it should be looked with suspicion to new formed bottom and peak point. Because of this, trend can be broken.

¹³⁸ Y.ERDİNÇ, **op.cit.**, p.355.

¹³⁹ F.ÖZÇAM, **op.cit.**, p.92.

4.4. Trendline Breakout

Trendline breakout (violation) represents a stock or a market deviating from its direction, in other words it represents changing of trend. Short-term trend lines broken show to small trend changes, while long-term trend lines broken show to movements of prices in the future will be longer. Terms that are being violent price movement, prices can violate to in the short-term trend line. Then prices stand on by they are returned on trend again. In such cases, to assume that trend line is broken may result in incorrect investment decision.¹⁴⁰ Below there is a chart that is an example of breakdown to downward trend in the direction of upward



Figure XVI Trendline Breakout

Source: <http://spesifikblog.net/category/finans/teknik-analiz/> (26.10.10)

For trendline breakout to be valid, technical analysts implement a number of filters (criteria). These are described below:

¹⁴⁰ Y.SARI, *op.cit.*, p.46.

- The first of these, breakout measure of price trendline. In other words, how much prices become distant of trend line. Here the generally accepted rule is that prices are separated from the trend line by 3%. However, some analysts take this rate as 5%. The measure of trendline breakout rate could take place in a day and also it could be take place 2-3 days. Trendline violations of prices are based on closing price.
- The other filter is trading volume movements. As a general rule, if a trendline is broken to downward, it is not needed to be high trading volume, but if a trendline is broken to upward, it should be raised trading volume. In other words, while prices are rising, trading volume should raise with the prices. But in some conditions; on the downward breakout trendline, trading volume can rise.
- Another filter is related with time filter. One of the best filters that are used very often is “2 days” rule. This rule can be applied as three days by some analysts. If prices, as from their closing price, are above or below the trendline with a period of two days (three days), it is assumed that trend line is broken. However the use of the filter can be a dangerous approach. Because, price reduction in form of violence may not allow to position closing on the desired levels. This situation can be big damage to investors.¹⁴¹
- The last criteria or filter is that, after the trendline breakout when prices return to trend line without they are not further in progress and a noticeable increase in the amount of trading volume, this movement is accepted as an approval of trend line. In this case, the smallest buying or selling pressure carries on forward to prices.¹⁴²

Sometimes prices can turn into broken trend. Such situations are called bull and bear traps on technical analysis. If prices brake to an upward trend, then they again rise above the trend and they continue in the direction of upward trend, this situation is called to “bear trap”. On the contrary, if prices break upstream to downward trend

¹⁴¹ A. AYBARS, **IMKB Uygulamalı Modern Teknik Analiz**, 1st Edit, İstanbul:Dünya Yayıncılık, 1997, p.25-29.

¹⁴² F.ÖZÇAM, **op.cit.**, p.93.

and they enter again into the trend and they continue in the direction of downward trend, in this case it is called as “bull trap”. In general; trading volume does not increase and by contrast trading volume thoroughly reduce, although prices are broken to trend on the bull and bear trap. In such cases; trend breakouts can be detected by looking trading volume and others filters.¹⁴³

4.5. Support and Resistance Points

For an investor who is invested in stock market, or a technical analyst, the most important information is how far prices will rise or fall. At an upward market; at which points to stocks are sold, if the stock has not been taken yet whether or not a margin to still making money, on the other hand; at a downward market; at which points to wait for make a purchase or if there is still a stock that has not been sold yet to sell to this stock has whether opportunity or not to answers of these questions are focused on the same topic. This issue is support and resistance points.

Support and resistance expressions are frequently used in technical analysis. Support point for technical analyst is defined as regions that prices could start to increase again and could stop to decline in prices even if it is temporary by attracting to enough recipients to bring in the stock market. Resistance points can be defined as rising price that came up to a certain level and they are rising any more and meet to supply on this level. Shortly, support and resistance points can be define as regions which are before balanced of demand and supply and then replaced of demand and supply.¹⁴⁴

It is expected that prices play around on the support and resistance area and after a while it is expected to prices are moved to downward and upward. But sometimes, a support or a resistance zone can not be breakout for a long time. In the situation of the examination of this support and resistance zones twice; possibility of breakout to these zones are increase on third movement. On the downward price

¹⁴³ Y.ERDİNÇ, **op.cit.**, p.355-356.

¹⁴⁴ A. MERGEN, **Grafiklerle Borsa Uygulamalı Teknik Analiz**, 3rd Edition, Istanbul:Beta Yayınları,1998, p.28.

movement; if decline force is greater than the power of support, in other words if supply is more than the demand, support region can not hold the prices and prices in that area will continue to decline steadily. On the upward; if demand is more than supply, resistance region can not do its duty and prices are proceed on its way in this region.¹⁴⁵

The following example charts are given to determine of support and resistance levels.



Figure XVII Support Point

Source: http://stockcharts.com/help/doku.php?id=chart_school:chart_analysis:support_and_resistan
(26.10.10)

¹⁴⁵ Y.SARI, *op.cit.*, p.84.



Figure XVIII Resistance Point

Source: http://stockcharts.com/help/doku.php?id=chart_school:chart_analysis:support_and_resistan
(26.10.10)

Strength of support and resistance regions is important. A number of criteria are used to estimate the power of these regions. The following descriptions are related to the criteria for resistance. Similar descriptions are also valid for support.¹⁴⁶

- **Trading Volume:** The first criterion for predicting the strength of the resistance level is trading volume. On the resistance point, as trading volume which is actualized previously, is higher so the resistance point will be too strong. However it should be noted that, the resistance point is relative.
- **Degree of Price Movement:** The second criterion for predicting resistance point is that; the degree of decrease of prices after a previous support level is broken. As the more price decreases so former support point that is transformed to resistance point, will be strong enough.
- **Time:** The last criteria is the length of time elapsed since the formation of the resistance level. As this time is longer, the resistance level will be stronger.

¹⁴⁶ F.ÖZÇAM, *op.cit.*, p.86-87.

Using closing prices for the determination of support and resistance points is clearly more useful for the detection of these regions. Support and resistance points are more easily detected and more reliable on the weekly prepared charts. In addition, using bar charts to determine resistance and support point on the short-term analysis can be more useful because they show to the highest and the lowest of the day.

Resistance and support regions are shown with straight line on charts. Support and resistance regions that are consisted of previously, are moved forward with the help of horizontal (straight) line with prices. These lines are never drawn in the form of downwardly or upwardly sloping. Trend lines that are drawn as sloping usually refer to support and resistance zones. But these lines are not resistance and not support lines in terms of technical analysis.

If support point is very strong, it will be strong equally while act as a resistance that is occurred when the support point is broken. It is vice versa. If a resistance is very strong, it will be strong equally while act as a support that is occurred while the resistance point is broken upward. This is called as “reversal role” in technical analysis.¹⁴⁷

Support and resistance breakout is a major importance for technical analysis and sometimes they are evaluated as a signal of trend changes. Broken of a small support point is evaluated by the first signals of changing direction of medium-term trend and broken of medium-term support point is evaluated to the first signals of changing direction of main trend. The same situation is valid for resistances. Therefore it should be right to determine the support and resistance level, these levels should be accepted by everybody and should be followed closely to break of this level.¹⁴⁸

¹⁴⁷ Y.SARI, **op.cit.**, p.84.

¹⁴⁸ F.ÖZÇAM, **op.cit.**, p.88.

4.6. Role Reversal between Support and Resistance

Support and resistance reversal is a case of a market that is needed to know. Supports and resistance points change the roles when they are broken with the high trading volume. In other words; a broken support level (previous bottom) is converted to a resistance point. The same way, during an upward trend of a broken resistance point (the previous peak) is converted to a support point usually with correction of prices. This condition is usually caused by investor psychology.

For example; if the support level is placed on the previous one lowest point, this means that, some investors have bought at this level. If the support region is broken at significant level, investors understand that they do wrong and they will sale on their purchase region to get rid of damage. Thus the previous support level is converted to a resistance point. The same way; during an upward trend, when investors who sale on previous peak point, saw the rising prices and prices came to point where they sold previously, they will want to use this chance by purchase. So previous resistance point will become to new support point with the formed demand.¹⁴⁹ Below a simulation graph is given which is related to how support point became a resistance point and how resistance point became a support point.



Figure XIX Role Reversal between Support and Resistance

Source: <http://www.stocks-for-beginners.com/support-and-resistance-trading.html> (27.10.10)

¹⁴⁹ John J. Murphy, Görsel Analiz, **op.cit.**, p.35-42.

This is also valid for trend lines. After the trendline is broken, prices are often drawn back to trendline but it can not pass to trendline, on this situation prices are continued in accordance with the new trend. Here role reversal emerges for trend lines. In other words, on the situation of the violation of uptrend line after the prices are pulled back, uptrend line is converted to a resistance area and it prevent to prices to go up. The same way, after the prices are broken up to trend line on downtrend line, trend line converted to support point by acting as a support on the price withdrawal. On the uptrend line breakout withdrawal of price is a chance for buying, on the other hand, rising which is consisted of after the breakout in downward, provides an opportunity for sales to investors.¹⁵⁰ The following chart, on upward trend if prices touch to trendline then return, it is evaluated as an opportunity for buying; if prices are broken downward to trend, it is evaluated as an opportunity for selling. The same way, on downward trend; it should be an evaluation for selling when the prices are touched to tend line and went back immediately from trend line. It should be evaluated for buying in the case of prices are broken to trend and returned toward to trend line again.

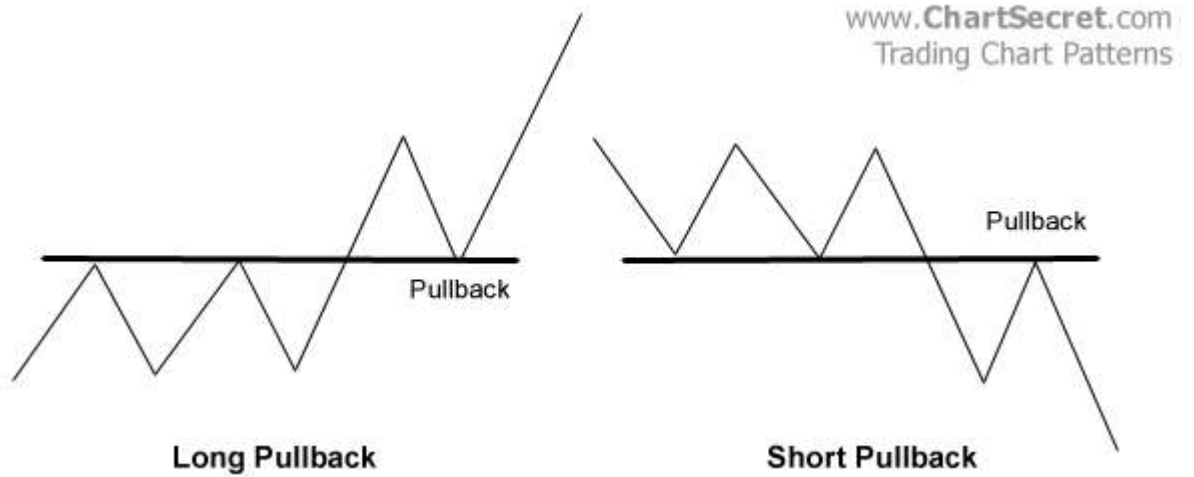


Figure XX Trend Line Pullback

Source: <http://www.chartsecret.com/content/trading-pullback> (27.10.10)

¹⁵⁰ A. MERGEN, *Grafiklerle Borsa Uygulamalı Teknik Analiz*, 3rd Edition, İstanbul:Beta Yayınları, 1998, p.28-35.

4.7. Trend Channels

Prices that proceed in the form of a trend turn towards to trend line again after they were become distant from the trend line and after a while they become distant from the trend line again. This situation is trend channels that are consisted with price fluctuations between line which is called as “channel line” and drawn parallel to trend line.

On emerging markets channel lines determine by combining of prices' peak points and they build up to uptrend channels. On the downtrend channel lines determine by combining of prices' bottom points and they build up to downtrend channels.¹⁵¹ The following chart is a n example both uptrend and downtrend channels. On the left hand of the chart represents to uptrend, on the right hand of the chart represents to downtrend channel.

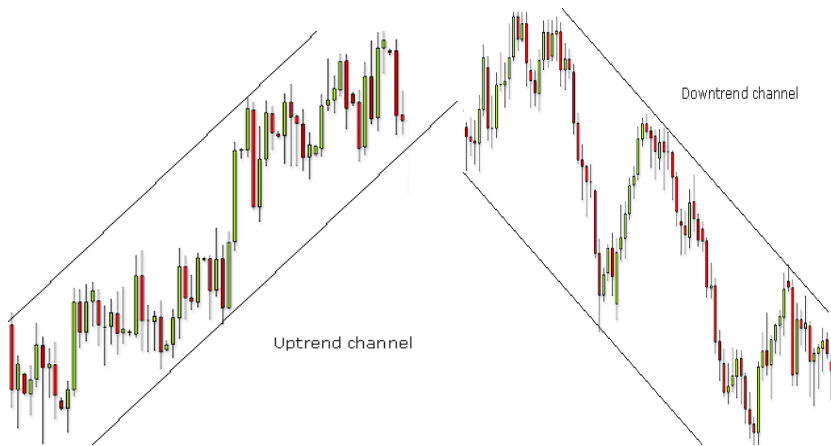


Figure XXI Downtrend and Uptrend Channel

Source: <http://www.forexpoint.com/forex-technical-analysis/trend-channels.htm> (29.10.10)

¹⁵¹ M. ŞAHİN, **Borsada Teknik Analiz**, 1st Edition, İstanbul: Mom Bilgisayar, 1992, p.107.

Trend channel lines are initially parallel to each other in general. Uptrend channel lines tend to move away from each other with the passing of time. It is observed on the downtrend, these lines are sometimes narrow. In general prices are raised or dropped in the channel (between the trend line and the channel lines) by moving to up and down. Trend channels are seen more on the active stocks, which have a high trading volume.

Stocks which occur trend channels, permit to short-term purchase and sell. Such transactions are usually done by speculators. To return of prices to trend channel with the trend channel method is evaluated to purchase opportunity. To come close of prices to up channel line is evaluated to sell opportunity. Thus purchase and sell are done by using the distance between channel lines and in this way profit is provided. However, this method is a risky method. Because there is not a general rule that prices will continue in the trend channel.¹⁵²

Channel lines can easily determined on charts and they may help to determine of support and resistance level. Some investors are regarded to trend channels as support and resistance levels and they build up to their purchase and sell strategy by this way. Trend channels are placed as parallel channels on the technical analysis programmes.¹⁵³

Trend channels have their measuring features. In general, when the stock prices emerged out of the trend channels, they progress up to proportion of trend channel width and then they return. Therefore; it can be detected to where prices can be go up when the stock prices emerged out of trend channels by drawing a new parallel line which is the proportion of channel width.¹⁵⁴

¹⁵² Y.SARI, **op.cit.**, p.47.

¹⁵³ John J. Murpy, Görsel Analiz, **op.cit.**, p.48.

¹⁵⁴ Ö. KILIÇAY, **Borsada Yatırım İçin Teknik Analiz Metodu**, 1st Edition, İstanbul:Beta Yayınları, 2003, p.95-96.

4.8. Trading Volume and Its Usage

Before starting to this subject, concepts of trading volume and trading size should be defined. While the trading volume shows to amount of shares which are passed into other hands, on a stock; trading size is monetary size which is the result of multiplying to amount of shares that are passed into other hands, with strike price. Although trading volume and trading size are used equivalent marking, while trading size is used usually as an indicator of daily financial transactions on indices, trading volume is used on the technical analysis and stock analysis.

Trading volume is the most important source of information that shows the dimensions of supply and demand in stock markets. In other words, it is the amount of stocks that is bought and sold in the stock market. Hence, the amount of trading volume is used as a measure of technical analysis. Trading volume is shown bottom section of charts in the form of bars. If the trading volume is more and more, the length of bars is extend and if the trading volume is decrease and decrease, the length of bars gets shorter.¹⁵⁵

It can be said that trading volume is a booster to market. It shows whether investors are optimistic or not. If the psychology of investors is optimistic, trading volume will be increase but if the psychology of investors is pessimistic, trading volume will be decrease.¹⁵⁶ The following chart shows to an example of trading volume.

¹⁵⁵ Y.SARI, **op.cit.**, p.96.

¹⁵⁶ Y. EROLGAÇ, **Borsada Yatırım ve Spekülasyon Stratejileri**, 1st Edition, İstanbul:Scala Yayıncılık, 2000, p.126.



Figure XXII Trading Volume

Source: <http://www.trelleborg.com/en/Investors/Annual-report-2008/Financial-statements/The-Trelleborg-share/> (31.10.10)

High and low of trading volume is shown as an alteration according to each stock. Therefore stocks should be comparing to its history while trading volume is being examined. Backward trading volume should be corrected because the capital increases changes to past trading volume.¹⁵⁷

According to technical analysts, changes in the trading volume are indicating pioneer for price changes. General principle of the trading volume is; movement of trading volume is in accordance with to trend. In other words, while prices are increased, trading volume also increases; while prices are decreased, the trading volume decreases. However, trading volume usually changes before the price movements. This situation is evaluated as a leading indicator which is signal of the trend change. Periods that the tendency of prices is increased, to realization of a high trading volume is an indicator of an uptrend. Otherwise; it is implemented as a downtrend.¹⁵⁸

¹⁵⁷ Y.SARI, *op.cit.*, p.99.

¹⁵⁸ M. BOLAK, *op.cit.*, p.137.

The basic assumption of trading volume is that, prices will follow trading volume. Therefore if the trading volume can be estimate, future process of prices can be predicted. Trading volume principles and rules, which are adopted by technical analysts, are explained below.¹⁵⁹

- To see high trading volume with the rise of prices is a normal feature of market. In other words, trading volume acts in accordance with trend. Rising prices should be confirmed with the high trading volume.
- If prices rise rapidly to a new peak with to trading volume but if the total trading volume remains lower to total trading volume that is placed previous rising, this situation may foreshadow a trend change.
- If rapid increases on prices develop inversely with the trading volume, this situation is a signal that prices would get to decrease tendency on future.
- After a prolonged decline of prices, in case of prices begin to rise again with the trading volume and this experiment continues two times; if the second experience trading volume is more than first experience trading volume, this is evaluated as a foreshadow of uptrend.
- While the prices are over to trend line and trading volume is increased, if the prices suddenly begin to decrease, this situation considers as foreshadow of downtrend.
- To stopping of reduction in the price and not raising of price although pass through a significant period of time, whereas to increase trading volume is interpreted as a signal of probable rise in the prices and this situation is interpreted as a signal of the end of the downtrend.

Trading volume analysis is an important data for technical analysis. For that reason, trading volume is regularly followed by technical analysis and there are many analysis methods for trading volume analysis. For example The Wall Street Journal everyday publishes to trin (trading index) ratio for investors. Trin rate is calculated as follows:

¹⁵⁹ G. KONURALP, **op.cit.**, p.124-125.

Number of advancing issues / Number of declining issues

Trading Index = _____

Total up trading volume / Total down trading volume

If trin rate is greater than 1, it signifies to bear market; if trin rate is smaller than 1, it signifies to bullish market.¹⁶⁰

¹⁶⁰ G. KONURALP, **op.cit.**, p.125.

PART V

FORMATIONS ON THE TECHNICAL ANALYSIS CHARTS

5.1. General Description

While stock prices are occurring in the stock exchange, they are under the influence of many known or unknown factors such as economical, psychological factors and news that are related to company.

Investors, who invest in stocks, may have reached this information or also may be unaware of this information. This information is reflected to demand and supply of stock. While some of these factors, which are created to prices, are forgotten; some continue to be effective on the stock price for a long time. This influence process provides movement of stock price in the direction of a trend. But this trend completes its life sooner or later and it gives place to another trend which has characteristic feature in the different direction.¹⁶¹

Change phase is of vital importance for the investor in order to give an efficient and timely decision. In this stage which is consisted of trend change, price movements reveal themselves as price formations, which have very similar characteristics; although price movements are most of the time emerged irregular forms. These price formations, which are known as “Reversal Chart Patterns”, help to analyzers to determine a possible trend change.¹⁶²

Characteristic price models, which are same to each other also called as formations by technical analysts, are images that are reflected to struggle of supply

¹⁶¹ Y.SARI, *op.cit.*, p.103.

¹⁶² M.ŞAHİN, *op.cit.*, p.38.

and demand, which are shown in short-term stoppages on the ongoing trends, with breaking points on the bottom and peak points.¹⁶³

Thus, to be completed in a formation would be perceived as an alarm signal in relation to trend changing. Therefore, investors are given to buying or selling decisions on the stage of change in trend when prices don't too rise or fall yet.¹⁶⁴

Prices formations are divided into two categories. The first one is continuation patterns that are confirmed the trend that would continue the same directions. The second one is called reversal patterns that are signaled to trend that will change.

The most important reason is creation of these price models, which are very similar to each others, the groups of investors reached to similar situation on similar conditions, in other words it can be explained that it is a philosophy that they repeated their past mistakes. It is possible to run across to some of these models both Istanbul Stock Exchange and other markets. Some of these models consist of rarely. While some of these models have high reliability, some of other models don't come up with the goods.¹⁶⁵

If the formation is completed the longer period, subsequently price changing would be great extent. While price formations are consisted, the completion time of formation and the changes in trading volume should be closely monitored.¹⁶⁶

5.2. Double Top Formation

Double top consists of price areas which sellers try to control stock price with stock amount and excess of selling appetite. These sales may occur by giving all or most of stocks and even it can occur where would be done to open sale.¹⁶⁷

¹⁶³ F. TOMAKİN, *Teknik Analiz ve MACD Göstergesinin İMKB'de Uygulanması*, Marmara University Social Science Institute, Department of Business, Unpublished Postgraduate Thesis, Istanbul, 2007, p.6.

¹⁶⁴ M.ŞAHİN, *op.cit.*, p.38.

¹⁶⁵ M.ŞAHİN, *op.cit.*, p.39.

¹⁶⁶ M.ŞAHİN, *op.cit.*, p.39.

On the double top formation, speedy rise in price begins with the very hard and very high trading volume at the end of output trends. After a while investors, who have seen ever increasing stock or market, begin to make sales. The day, which starts with sale pressure, trading volume reaches to highest level.¹⁶⁸ On sale day, market returns immediately to minus and comes to hard sales. As a result of sales, buyer is over in the environment, price speed moves down and the first top emerges in the middle. Trader usually may not be quite sure to there can last top, which is emerged top, for expected to reductions stop to a previous support point.¹⁶⁹ After prices are suddenly meet to sales, sales come up to down 15-20% of its bottom and peak point. But, it occurs in an upward move with the investors have a feeling that prices are low. Rally again starts towards to former top to build up second top; with the prices departure from support point.¹⁷⁰

Double top formation does not occur in two days on the established stock exchange. It should be pass one or two months between two top (these tops must be very clear). These models shouldn't be confused to models that are consisted of a much shorter period of time. Because these kinds of tops are frequently seen existing trends or they are seen creation of rectangular and triangular patterns. Trend may continue to its way on this type of movements and it is interpreted in the form of congestion of stock or indices. If and only double tops may be two or three days on the some speculative stocks.¹⁷¹

One of the points to be aware of this formation is seen of neck line exceedance to downward. Only at that time, this formation is confirmed as double top formation. Another point to note is that prices sometimes perform to move to downward less than 5% by coming down the neck line and then they react again to

¹⁶⁷ L.STEVENS, **op.cit.**, p.139.

¹⁶⁸ F.TOMAKİN, **op.cit.**, p.74.

¹⁶⁹ A.MERGEN,**op.cit.**, p.83.

¹⁷⁰ A.MERGEN,**op.cit.**, p.83.

¹⁷¹ F.TOMAKİN, **op.cit.**, p.75.

upward. This movement should be monitored and if necessary, a stop level should be built up.¹⁷²

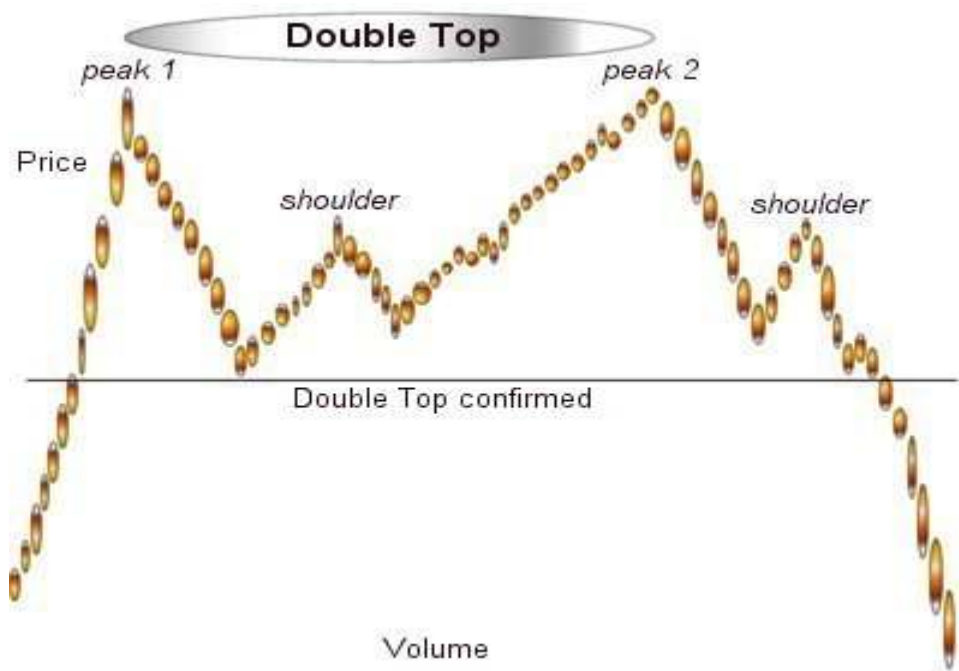


Figure XXIII Double Top Formation

Source: http://en.wikipedia.org/wiki/File:Double_top_formation.jpg (01.11.10)

5.3. Double Bottom Formation

Double bottoms consist of the price levels which are in the deeps and buyers willing to buy the stock. If potential buyers have exceedingly concern for buying stock on certain stock price level and there is not a general change on the general view of the market, when the stock prices again come to same price range, buyers are again willing to buy stock and this request will cause to second come back from the

¹⁷² Thomas N. BULKOWSKI, *Encyclopedia of Chart Patterns*, 2nd Edition, USA: Wiley Trading, 2005, p.280.

bottom. Double bottom pattern is similar to as an image of W letter. This model is inverted form of double top formation.¹⁷³

This model becomes a reality at the end of long-lasting decrease flow. It is a movement of changing to flow direction which is appeared often in ISE.¹⁷⁴ In this model, initial formation is a bottom level that is consisted of at the point of downtrend. This bottom level originally is not an image that is able to change to downtrend. During to formation of this bottom, trading volume is very high and with the return of prices from this bottom level, trading volume begins to decline. This situation is appropriate for a downtrend.¹⁷⁵

After the stock began to high speed movement by broking the neck line, minimum rise level, which are gone by price, is height of the pattern. In other words, after the prices are minimum passed up to neck line, they will rise until the vertical distance which is between to lower limit (baseline) and upper limit (neck line) of the pattern. If long-term decline occurs before the creation of the model, going distance can be more than this minimum distance.

If prices don't exceed to neck line and comes down again, it may be creation of a triple bottom formation. On the triple bottom formation, trading size increases day by day on price rise to each bottom. In other words, while prices are collected together after they created of the first bottom, trading size is low; rising level of second bottom is more than first bottom and finally with the third bottom price rising trading size is highest level.¹⁷⁶ Below is an example of double bottom formation.

¹⁷³ L.STEVENS, **op.cit.**, p.139.

¹⁷⁴ A.MERGEN,**op.cit.**, p.100.

¹⁷⁵ F.TOMAKİN, **op.cit.**, p.78.

¹⁷⁶ M.ŞAHİN, **op.cit.**, p.62.

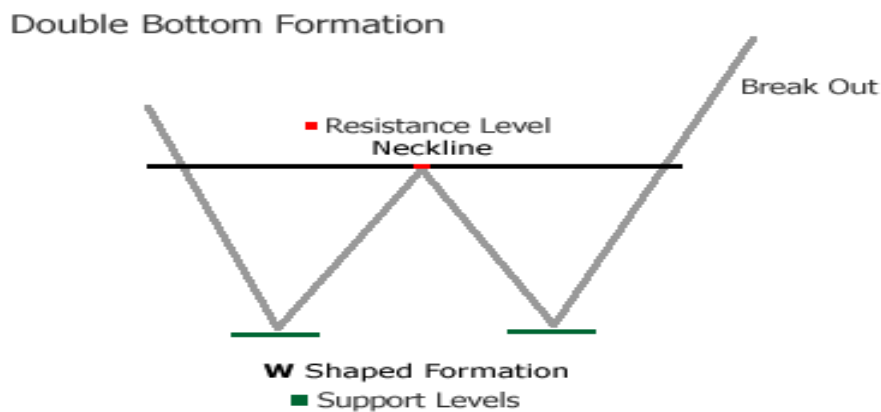


Figure XXIV Double Bottom Formation

Source: http://www.aboutcurrency.com/university/fxchartpatterns/forex_double_bottom_chart_pattern.shtml (01.11.10)

5.4. Head and Shoulders Pattern

Head and shoulders top points are mostly consisted of after the continuing uptrend at a certain period of time.¹⁷⁷ These are one of the strongest top formations. They cause to large losses. If they consist of in the indices, decrease of many stock prices also should be considered.¹⁷⁸

During formation, stock makes intermediate top with the large amounts of trading volume. With the coming sales wave and with the struggle between buyer and seller creates to pressure area. During this term, return and a small top has already consisted of on the stock. Price level is broken with wining the most recent buyers and it reaches to a new top in a speedy way. Long-term output current begins to show signs of decay. A fast sale begin at the new peak point and prices are dropped rapidly in the form of top point will be in the middle. Head part of formation is consisted. Prices, which are supported to flow line, attempt to skinny rise but the strength of this movement is insufficient. So, the right shoulder was consisted. From

¹⁷⁷ L.STEVENS, *op.cit.*, p.166.

¹⁷⁸ A.MERGEN, *op.cit.*, p.117.

here it should be considered that in case of neckline breakage it should be run away from stock.

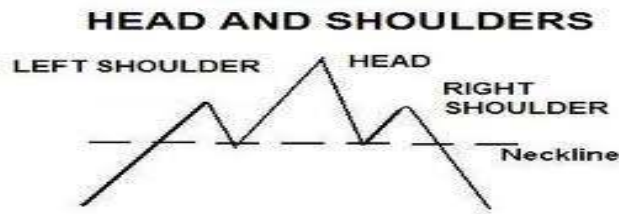


Figure XXV Head and Shoulders Pattern

Source: <http://www.simple-stock-trading.com/head-and-shoulders.html> (01.11.10)

Mostly, left shoulder has the highest volume. Head point is volume a bit less than the left shoulder. On the other hand right shoulder's output is weak and its volume is noticeably lower than the others.¹⁷⁹

It is not in question that the neckline is exactly horizontal. Head and shoulders patterns may occur in the following ways. Note that; neckline can be slope up or down.

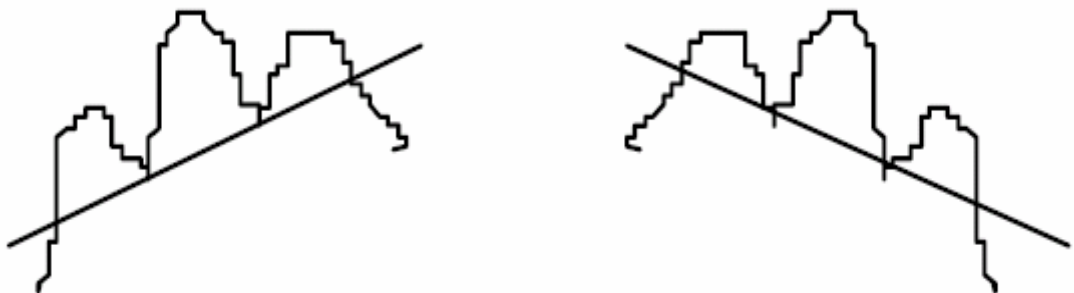


Figure XXVI Different Shapes on The Top of Head and Shoulders

Source: Y. ERDİNÇ, *Teknik Analiz Sorgulanıyor*, 1st Edition, İstanbul, Siyasal Kitabevi 2004, p.303.

¹⁷⁹ Thomas N. BULKOWSKI, *op.cit.*, p.406.

When compared to head and shoulders which have upward neckline, head and shoulders which have downward neckline; head and shoulders which has upward neckline, carries less potential to decrease than head and shoulders which has downward neckline.¹⁸⁰

Head and shoulders don't occur on the day of a transaction; normally creation of formation may take months on the stock exchange.¹⁸¹ In general, as time, which is consisted of formation, is longer so the falling prices with the trend change are longer. However, according to madding observations, elapsed time from the start of left shoulder to finishing of right shoulder is an average two months. When left shoulder, head and right shoulder are investigated separately it is observed that shoulders take to 15 days and head takes to 20 days.

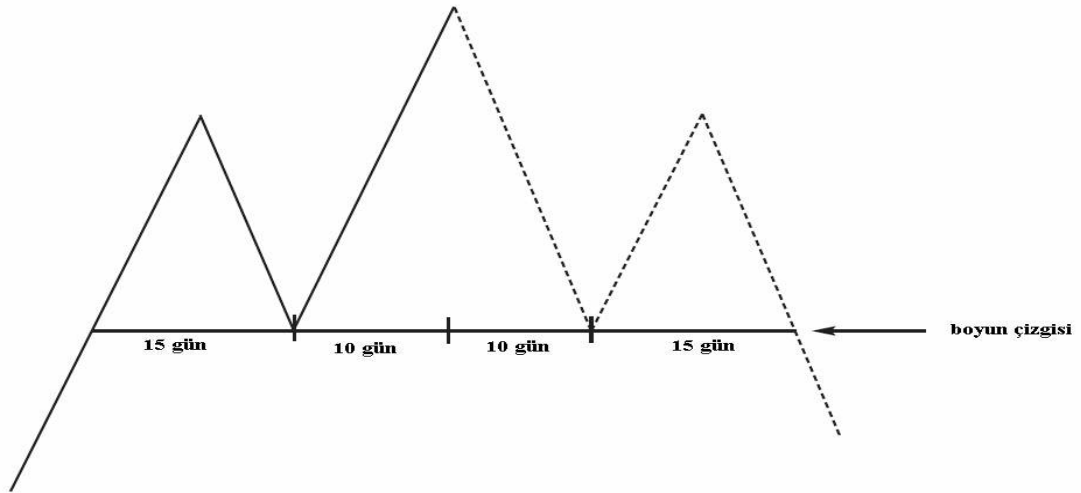


Figure XXVII Elapsed Time of Head and Shoulders' Peak Points

Source: Nicole Elliott, Ichimoku Charts, **An Introduction to Ichimoku Kinko Clouds**, 1st Edition, Great Britain, Harriman House, 2007, p.65.

¹⁸⁰ G. APPEL, **Technical Analysis, Power Tools for Active Investors**, 1st Edition, USA: FT Prentice Hall, 2005, p.74.

¹⁸¹ A.MERGEN, **op.cit.**, p.117.

Also, when investigated to peak points of shoulder-head-shoulder features; it is revealed that long and tight formations are given better results than short and wide formations. Formations with increasing volume, U-shaped formations and high-volume breaks are given better results.¹⁸²

5.5. Reverse Head and Shoulders Pattern

It is a strong and reliable base model at the bottom levels (at the end of downtrend). It is a model that is similar to in the form of reversal head and shoulder formation and its features are almost similar to normally head and shoulders formation. This model generally consists of at the end of downtrend and the emergence of this model foreshadows of the uptrend.¹⁸³

This model is similar to straight head and shoulders as a rule, feature and stage. But this model differs from normally head and shoulders formation in terms of trading volume. Similarly this model is a little frowzier and it consists of a longer period of time.¹⁸⁴

Output is not very strong until the starting from the first bottom level and flow returns from the resistance line. Decrease makes one more bottom point and starts to increase by making towards to below in the previous bottom point. In this period, smart money begins to collect to stock by predicting changing or increasing on basic data.¹⁸⁵ Formed new output drills to upward but it can not exceed the neckline. In this case, left shoulder and head part are created. Prices are lighter and fall down at last time but don't reduce to first bottom point.

Trading volume is generally less during creation of this model. This is because of the model realizations on the bottom price levels. However low trading volume starts to increase with right shoulder begins to occur and right shoulder

¹⁸² Thomas N. BULKOWSKI, *op.cit.*, p.405.

¹⁸³ F.TOMAKIN, *op.cit.*, p.72.

¹⁸⁴ Martin J. PRING, *op.cit.*, p.114-115.

¹⁸⁵ Thomas N. BULKOWSKI, *op.cit.*, p.376.

begins progress towards neckline and when the model is completed and broken upward, trading volume reaches to highest levels.¹⁸⁶

Normally all of the head and shoulders formation is symmetrical. If left shoulder is sharp pointed, right shoulder would be sharp pointed. A formation that appears good, the slope of neckline is not very perpendicular. But perpendicular neckline is not an indicator that ignores the formation. However it is a suspicious development. Such that, this type of head and shoulders formation never may not occurs an indication.¹⁸⁷

On researches conducted, reverse head and shoulder formations that are occurred in bullish market, have been the increase of average 38%. On the bear market models, increasement has been the average of 30%. This is one of the indicators that are needed to move parallel to the market. 25% with 33% of samples that are seen to formation occur, made at least 45% of the premium. After prices are reached to tip, prices showed an average decrease of 30%.¹⁸⁸

5.6. Triangle Formations

Triangle formations emerge in consequence of triangle shapes that prices have been done. Prices after did to a certain top, fall into a decline but, if prices are supported by a certain price level in the course of reduction, this type of formations emerge in generally.¹⁸⁹

These models are the most common and most easily defined on graphics. Reliability of these models is lower than such as head and shoulders models. Triangle formations can be emergence such as trend changing models on the transformation points of main trends, also they can be emergence such as continuing models on areas that have been minor movements and price squeezes.¹⁹⁰ The main

¹⁸⁶ A.ÖZEKŞİ, **op.cit.**, p.90.

¹⁸⁷ Thomas N. BULKOWSKI, **op.cit.**, p.377-379.

¹⁸⁸ Thomas N. BULKOWSKI, **op.cit.**, p.381.

¹⁸⁹ Y.ERDİNÇ, **op.cit.**, p.315.

¹⁹⁰ Martin J. PRING, **op.cit.**, p.93.

difference between them is the generation time. Triangle models that occur during to continue of existing trend consist of a shorter period of time than the triangle models that are teller to trend change. Without this, all of the characteristic features are the same.¹⁹¹

Triangles consist of time period, which market decided whether having position or not on the current situation without the available positions and volume gradually decreases on this time period.¹⁹² As a rule, triangles are used as an indicator of continuity formations and length measurement. Length of time spent while triangle occurs would be equal to destination of market when the formation was broken.¹⁹³

The creation of triangle models differentiates from 1 month with between 3 and 4 months. This time sometimes can take time on the transformation points of long-term trends. However, triangle models that doesn't occur less time than 3 weeks. In addition, the most typical characteristic of a triangle model is, trading volume prominently decreases day by day since the start of formation creation until the model is completed.¹⁹⁴

The triangle formations can be divided into three. These are symmetrical triangles, descending triangles and ascending triangles.¹⁹⁵

¹⁹¹ F.TOMAKİN, **op.cit.**, p.80.

¹⁹² John L. PERSON, **A complete guide to Technical Trading Tactics**, 1st Edition, Canada: John Wiley and Sons, 2004, p.80.

¹⁹³ John L. PERSON, **op.cit.**, p.80-81.

¹⁹⁴ A. ÖZEKŞİ, **op.cit.**, p.95.

¹⁹⁵ Y.ERDİNÇ, **op.cit.**, p.315.

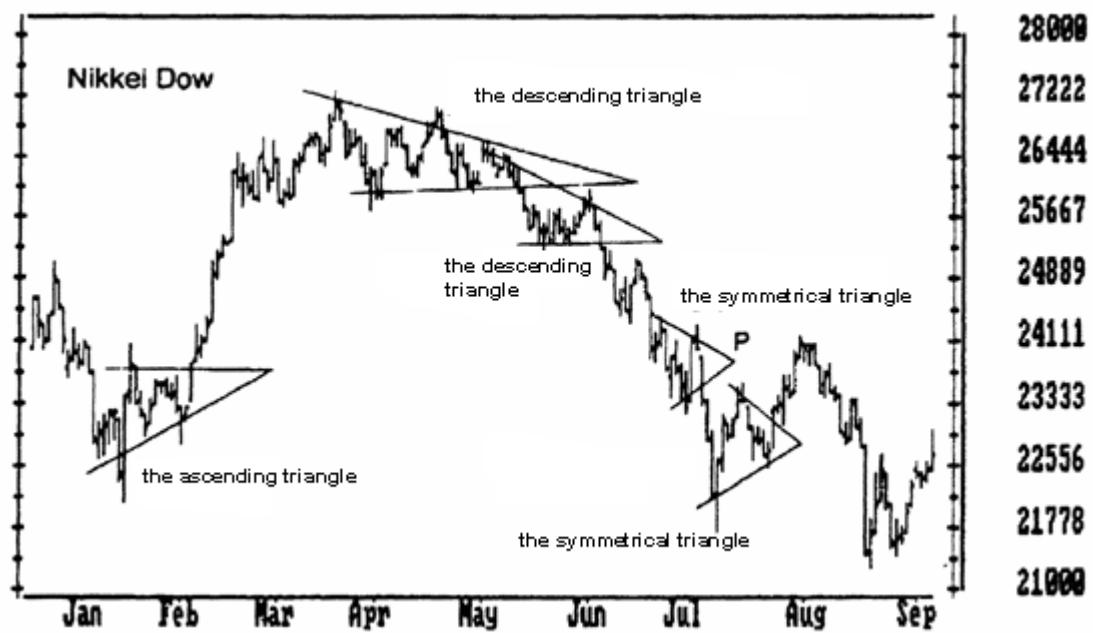


Figure XXVIII The Symmetrical, Descending and Ascending Triangles

Source: http://www.masterforex-v.su/002_016.htm (03.10.10)

5.6.1. The Symmetrical Triangle Formation

The end of symmetric triangle can result rise or fall. This region is a range that buys and sales pressure is completely equal. Each buying is met to selling and each selling is met to buying. The last high price level is lower than the previous high level. At the same time, the last low price level is higher than the previous low level. There is not any certain trend to follow. This shape created to symmetrical triangle formation. Volume gradually decreases in this process.¹⁹⁶

Line, which is combined to peak points, must be downward-slopping. Line, which is combined to bottom points, must be upward-slopping. Drawn of two lines

¹⁹⁶ S. CHUA, **Day Trade Your Way to Financial Freedom**, 2nd Edition, USA: John Wiley and Sons, 2007, p.99.

provide to triangle appearance by combining with a point. At least two peaks and two valley bottoms are needed for this formation.¹⁹⁷

These formations generally continue to trend that is placed before the creation of formation. If prices build up to a symmetrical triangle formation immediately after the downtrend, this formation probably will realize to brake the downward.

If prices build up a symmetrical triangle formation immediately after the upward, this formation probably will realize to brake the upward. Therefore, the condition of break to downward and upward of symmetrical triangles is determined with trend which is previously developed from symmetrical triangles. It is also called to continuity formations.¹⁹⁸

When volume was investigated in general, volume chart is downward-slope. Volume can be increase in triangle when time of return but in general volume is decreased. Changing can be observed easily on the 80% of symmetrical triangles. 54% of breaks will take place in the direction of the previous **trend**.¹⁹⁹

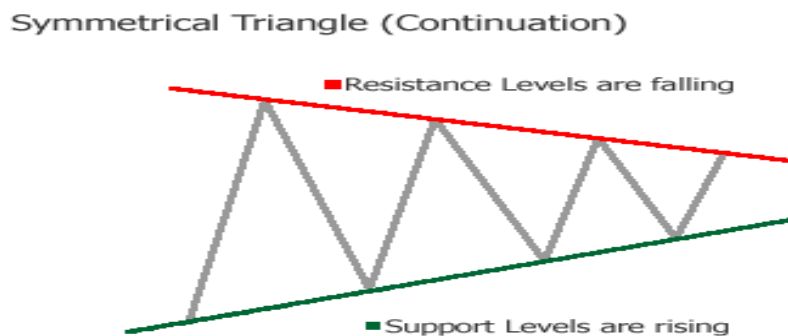


Figure XXIX The Symmetrical Triangle

¹⁹⁷ A.MERGEN, **op.cit.**, p.177.

¹⁹⁸ S. CHUA, **op.cit.**, p.99.

¹⁹⁹ Thomas N. BULKOWSKI, **op.cit.**, p.752.

Source:http://www.aboutcurrency.com/university/fxchartpatterns/forex_symmetrical_triangle_chart_pattern.shtml (03.10.10)

5.6.2. The Ascending Triangle

Ascending triangle models are similar to symmetrical triangle models in terms of many features and characteristic features. But ascending triangle models (also descending triangle models) are more consistent models than the symmetrical triangle models in terms of reliability and in terms of prediction to direction of prices.²⁰⁰ As is evident from its name, the ascending triangle models are likely a precursor of increase.²⁰¹ They are often accepted as recreation areas which are created in output currents and they occur as continuation patterns which mean that continuation of existing trend.²⁰² However it is very common condition that, emerging of these trends are as a trend changing models, which are foreshadowed to uptrend after the end of downtrend.

Resistance line is horizontal and support line is ascending slope on a triangle with ascending slope. To avoid from wrong breaking signals, it is recommended to wait for creation at the total three peaks (or two bottoms). When level of closing price on the resistance point or below to support point, buy or sell signal is taken.²⁰³

During the creation of a triangle first volume exceeds. However, volume continuously decreases until the broken day. Even sometimes, volume is quite low before a few days ago from breaking. Volume considerably increases when the time of broken but having a high volume when the time of broken is not prerequisite.²⁰⁴ After the prices are broken, prices climb up to upward. But after the breaks, returns are sometimes formed to confirm the broken line.²⁰⁵

²⁰⁰ M.ŞAHİN, *op.cit.*, p.65.

²⁰¹ John L. PERSON, A complete guide to Technical Trading Tactics, *op.cit.*, p.81.

²⁰² A.MERGEN, *op.cit.*, p.194.

²⁰³ R.FISCHER and J. FISCHER, *Candlesticks Fibonacci and Charting Pattern Trading Tools*, 1st Edition, USA: John Wiley and Sons, 2003, p.36-37.

²⁰⁴ Thomas N. BULKOWSKI, *op.cit.*, p.714-715.

²⁰⁵ Thomas N. BULKOWSKI, *op.cit.*, p.715.

While time period is longer, the ascending triangle models, which are consisted of big and longer period of time, there are likely to break to downward of model because of the increased mistrust on investors. This possibility is higher on the ascending triangles which have high ascending slope. Therefore, ascending triangles, which are consisted of important output currents, should be examined carefully.²⁰⁶

Prices are often able to breach to maximum rate line on the ascending triangle formation in the day due to overdone buying which is done by buyers. These violations should not be evaluated as breaking point. Closing prices should be taken into account and breaking must be realization with a high trading volume for approval of breaking. In addition for approval of breaking, some analysts implement to two days rule and others wait to prices' away from maximum rate of approximately 3% to make sure from model.²⁰⁷

One of the other bad situations, which are occurred on the ascending triangle, is high resistance levels. If high resistance level is very close after the breaking, stock prices can not rise up to provided distance and it can be return to that level. Therefore, before buying, resistance levels should be examined after breaking.²⁰⁸

²⁰⁶ F.TOMAKİN, **op.cit.**, p.87.

²⁰⁷ A. ÖZEKŞİ, **op.cit.**, p.100.

²⁰⁸ Thomas N. BULKOWSKI, **op.cit.**, p.719.

Ascending Triangle Formation



Figure XXX The Ascending Triangle

Source: http://www.aboutcurrency.com/university/fxchartpatterns/forex_symmetrical_triangle_chart_pattern.shtml (03.10.10)

5.6.3. The Descending Triangle Formation

Unlike to ascending triangle models, descending triangle models foreshadow of decline. They can be formed in downward flow also they can be seen in upward flow in the form of couple top. In short, they can be formed in every kind of trend. Subgrade level (lower limit) of model is developed in the form of horizontal while peak points are formed in the form of downward trend maximum rate line by occurred further down the levels according to previous peak points.²⁰⁹

Descending triangle pattern is similar to ascending triangle pattern and it is as reliable as ascending triangle formation. Actually, the creation of triangle in the market is based on certain some things. Purchase orders concentrate on a certain region, which is considered as cheap in a certain range by stock investors. Buying, which is came from this region, with prices, which are returned from this level, form to bottom line of triangle on chart. When prices move to upward with buying, which

²⁰⁹ A.MERGEN, *op.cit.*, p.184.

come from this region, they start to sell from lower price levels and finally, positive thoughts about to stock begin to end and buying doesn't come on price levels which are formed to bottom line of triangle.²¹⁰

One of the points to consider is; direction of breaking with direction of market is whether in the same direction or not. A triangle, which is broken down, may starts to move to upward by deflection with the market towards to mobilization to new peaks. For that reason; when get position, market should not be ignored.²¹¹

Tall formations show better or the same performance as compared to short formations. On the other hand large formations show better performance than narrow formations without break out. The average distance of a triangle takes 53 to 69 days and formations that are formed to upward consist of a longer period of time than triangles that are formed to downward.²¹²

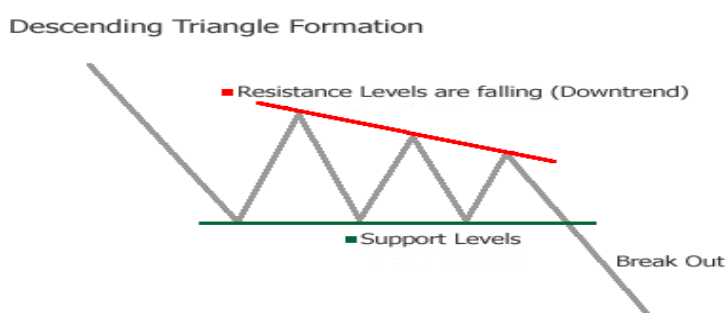


Figure XXXI The Descending Triangle

Source: http://www.aboutcurrency.com/university/fxchartpatterns/forex_symmetrical_triangle_chart_pattern.shtml (03.10.10)

²¹⁰ C. ALEXANDER, *Timing Technique for Commodity Futures Markets*, 2nd Edition, USA: McGraw-Hill, 2008, p.133.

²¹¹ Thomas N. BULKOWSKI, *op.cit.*, p.737-738.

²¹² Thomas N. BULKOWSKI, *op.cit.*, p.741.

5.7. Key Reversal Day

Key days, which are consisted of peak and bottom points of risings and declines and shown to its own characteristic features, signals to trend change. In general this type of movements consists after the declines or risings which are long acting.²¹³



Figure XXXII The Key Reversal Buying and Selling Signal

Source: C. ALEXANDER, *op.cit.*, p.24.

This formation may occur on strong bullish markets that are carried to stocks to new peak points, with sells which are came with bad news. When sales began in these markets, investors will be selling for realize to their profits at least a portion. These price movements may cause to excessive movements in both directions.²¹⁴ While prices are suddenly decreased on the return day from above, prices are

²¹³ A.ÖZEKŞİ, *op.cit.*, p.121-123.

²¹⁴ R. FISCHER and J. FISCHER, *op.cit.*, p.36.

suddenly increased on the return day from below. The most important outstanding point is that, trading volume of stock is increased and the price range of stock in a day is big. This formation appears very often on the fast moving stocks. Back away movements are began with inversion of prices in a day. Purchase madness of buyers has been satisfied.²¹⁵ After this situation is occurred to have a short position can be the cause profits of investors. Because these sales could be continue. The opposite of top image can be seen stock which goes down for a long time. For this, the following conditions must be realized:²¹⁶

- Market tests to bottom price levels in a day which are more bottom than the previous days.
- There is a strong and steep decrease which has a strong momentum for a long time.
- It should be a strong get reaction from the bottom.
- Reverse motion is quite remarkable on the opening at the markets where are opened to most bottom or close to the bottom points.
- When reverse motion occurred, it should be a noticeable improvement in volume and volume should not be narrow when the closing of market.

On the formation of this movement there are two chart types which should be considered. These are outside bar chart and inside bar

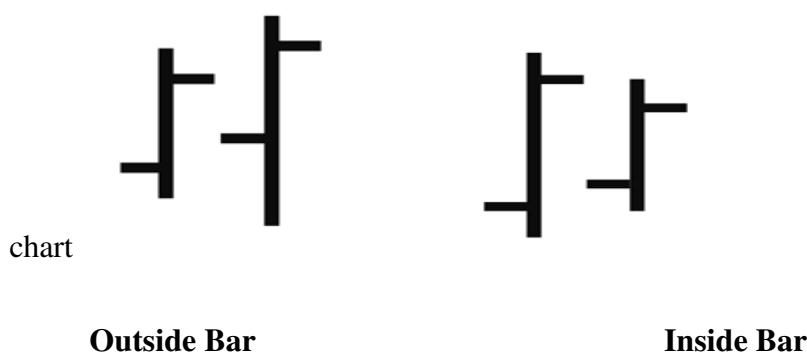


Figure XXXIII Chart Types of Key Reversal

²¹⁵ A.MERGEN, *op.cit.*, p.106.

²¹⁶ C. ALEXANDER, *op.cit.*, p.24.

Source: John L. PERSON, A complete guide to Technical Trading Tactics, **op.cit.**, p.36-37.

Outside bar has been created if the lowest and highest prices, which are seen on the movement day, are lower or higher than the previous day's lowest and highest prices. This is usually a harbinger of that the market direction will continue in the same way. On the other hand; inside bar has been created if the lowest and highest prices, which are seen on the movement day, are little lower or little higher than the previous day's lowest and highest prices. In these days the direction of broken will be determined to movement.²¹⁷

Trading volume occurs abnormally on the key days. Key days refer to changing of existing trends. It implies to the end of demand on its peak point and it implies to the end of supply in its bottom point.²¹⁸

5.8. Island Reversal Formation

Island formations occur on compressed price regions, which has been price bottleneck and before and after price movements have been separated with gaps.²¹⁹ Island formations can occur in the form of island top and island bottom. Island bottom is formed at the end of long term down-trends, firstly it always moves into lower regions one or more days by leaving a gap; then with the return day it occurs with the return of up by leaving a gap to upward.²²⁰ The resulting image is like an island. Island top is opposite to island bottom. As a result of this formation, it is expected to trend changing and droop on the prices.²²¹

Island formation is not very common and it is not very important without constituted long term peak and bottom point in itself. But as a rule, it reverses to direction of long-term trend. It is expected that this formation should become a fact

²¹⁷ John L. PERSON, A complete guide to Technical Trading Tactics, **op.cit.**, p.36-37

²¹⁸ John J. MURPHY, **Charting Made Easy**. 1st Edition. USA: Marketplace Books, 2000.

²¹⁹ Richard W.SCHABACKER, **Technical Analysis and Stock Market Profits**, 1st Edition, Great Britain: Harriman House Ltd, 2005, p.169.

²²⁰ L.STEVENS, **op.cit.**, p.195.

²²¹ L.STEVENS, **op.cit.**, p.197.

with a high volume. Gaps consist of the same price levels. Thus the remaining region consists on chart such as an island.²²²

To reach of prices on the highest levels before the return on the island top takes only a few days. The average time of the island formation is over a month but it begins from a day up to 6 months.²²³ The time of island formations can vary according to type of market. For example the realization time of formations is shorter on the more speculative markets.²²⁴

The best performance is seen on the upward broken which is occurred on the bull market or downward broken which is occurred on the bear market. When buy-sell process is made general market trend should not be ignored. After the island formation is completed, returns can be occurred for completion of second gap. When the chart types are investigated, long formations are shown to better or at least similar performance than the short formations. In addition large formations are shown better performance than narrow formations. The average island formation takes one month. But in the bear market, upward breakings take 45 days.²²⁵

Island bottom and tops are shown in below chart.

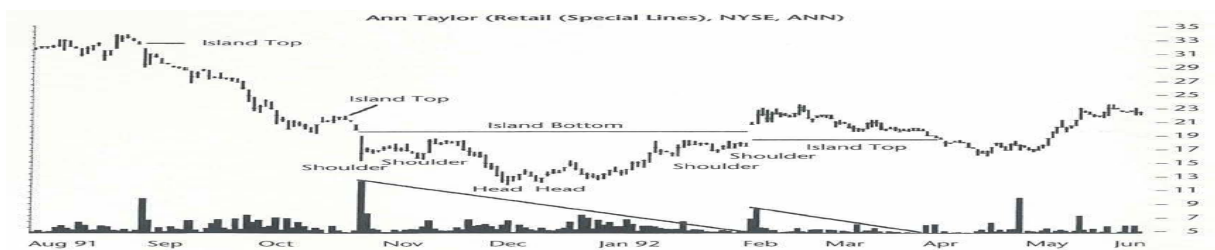


Figure XXXIV Island Bottoms and Tops

Source: Thomas N. BULKOWSKI, Encyclopedia of Chart Patterns, **op.cit.**, p.468.

²²² J. MAGEE, *The Introduction to the Magee System of Technical Analysis*, USA: CRC Press, 2005, p.68-69.

²²³ Thomas N. BULKOWSKI, **op.cit.**, p.467-468.

²²⁴ John L. PERSON, *A Complete Guide to Technical Trading Tactics*, **op.cit.**, p.267.

²²⁵ Thomas N. BULKOWSKI, **op.cit.**, p.470-475.

5.9. Diamond Formation

Diamond pattern, which is seen rarely on charts and ISE, is not a single pattern that consist combination with the successive two models.²²⁶ Diamond top formation can be defined as complex head and shoulders formations that have V shaped neckline.²²⁷

Diamond formation expands with the effect of speculative buys and sells and it begins by creating higher tops and lower bottoms then this situation is reversed and prices begin to press until the breaking occurs. Diamond formation usually emerges as main trend change which is occurred on the top of market. The most important reason of this, for the creation of this formation it is needed to moveable period when has been high trading volume especially in the first of half of this formation.²²⁸ Formation is rarely shaped as bottom formation but it can occur in continuing formation. When the formation is occurred as a continuing formation, it should be interpreted that this formations are like to be flag formations.²²⁹

Diamond formation represents the struggle between buyer and supplier. Until the sales pressure of sellers pushes down the prices, strong demand of buyers shoves upward the prices. If the sales pressure is strong enough, prices go to new bottom points. This expansion formation is calmer after the oscillations and which side is stronger arises.²³⁰

On research conducted, long formations show better performance than the short formations. A diamond formation takes an average of one month. Diamond formations which are consisted of at bottoms, long and wide formations are shown the best performance. On the other hand, short and narrow formations are shown the worst performance. Diamond formations which are occurred at the tops are not a

²²⁶ John L. PERSON, A Complete Guide to Technical Trading Tactics, **op.cit.**, p.82.

²²⁷ Robert EDWARDS, John MAGEE, W.H.C. BASSETTI, **op.cit.**, p.160.

²²⁸ M.ŞAHİN, **op.cit.**, p.73.

²²⁹ John L. PERSON, A Complete Guide to Technical Trading Tactics, **op.cit.**, p.82-83.

²³⁰ Thomas N. BULKOWSKI, **op.cit.**, p.181.

significance difference from the diamond formations which are occurred at the bottoms.²³¹



Figure XXXV Diamond Top Formation

Source: <http://www.investopedia.com/articles/forex/05/DiamondBear.asp> (04.11.10)

5.10. Symmetrical Broadening Formations and Inverted Triangles

It is formed as total opposite of symmetrical triangle. Its trend lines create a megaphone-shaped appearance by moving in the direction of new peaks and bottoms. The difference of this formation from other formations is the slope of trend lines. Uptrend line should be ascending slope and downtrend line should be downward-sloping. If one of the two trend lines is horizontal, the formation is classified as right-angled ascending or descending broadening formation.²³²

Prices after started with the narrow fluctuations and broaden, they move away from each other rather than converge.²³³ If the previous formed trend is downwardly,

²³¹ Thomas N. BULKOWSKI, *op.cit.*, p.191.

²³² Thomas N. BULKOWSKI, *op.cit.*, p.66-67.

²³³ J.MAGEE, *op.cit.*, p.219.

this formation is called broadening bottom. If the previous formed trend is upwardly, this formation is called broadening top.²³⁴

When the symmetrical broadening formations were investigated, although they consist of broadening price movements while they go up or go down, lower or upper limit lines of others are horizontal. Therefore, these are called as flattened bottom and flattened top.²³⁵

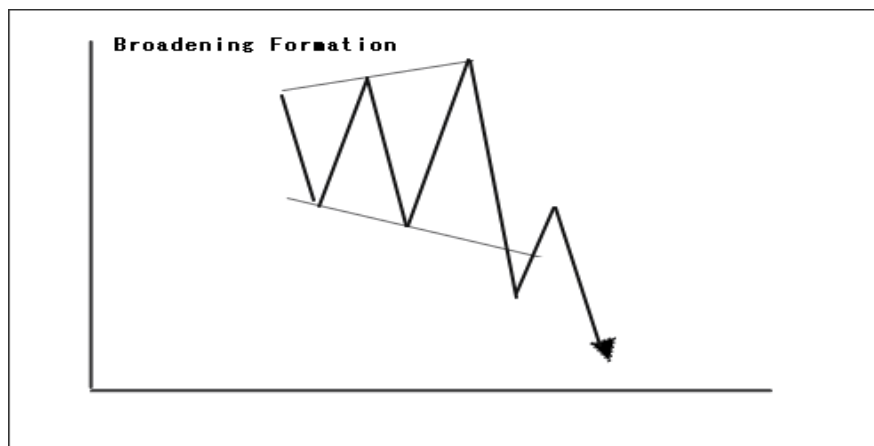


Figure XXXVI Broadening Formations

Source: <http://www.forexchannel.org/forex/continuation.html> (04.11.10)

Broadening tops should have 5 returns in generally. Based on this, each return should become fact aback of the previous return. If the formation is top formation, the last return will be downwardly. Thus it can change by going back.²³⁶

The direction of trend will become perceptible with prices broken to boundary line by completing to formation. However, in order to predict the direction of trend, the last price fluctuation in the formation will give an idea with respect to direction of trend. If last rise in price in formation could not up to the pervious rise

²³⁴ L.STEVENS, *op.cit.*, p.182.

²³⁵ M.ŞAHİN, *op.cit.*, p.70.

²³⁶ **Technical Analysis, A personal Seminar**, 1st Edition, New York: New York Institute of Finance, 1989, p.182.

level, it refers to that trend goes to downward. Otherwise, it refers to that trend goes to upward.²³⁷

23% of broadening formations, which is consisted in bull market, provides profit over 45%. After the prices reach the highest level in pursuit of breaking, they fall down the average rate of 33%. Declines, which are taken place in bear market, become steeper than risings, which are taken place in bull market but prices haven't got a change such that percentage changing. In general long formations are shown better performance than the short formations. Wide or narrow formations are not clearly different in terms of the performance.²³⁸

5.11. Rounding Bottom

Rounding bottoms are struggles which are between demand of buyers and pressure of sellers and forces equal to each other. The first part of formation, sellers are more dominant and they draw down to prices. As time passes, demand of buyers equals to pressure of sellers and stock prices are occurred in the cheapest level and they move horizontal for a while. After the certain séance, demand of buyers is more prevail and stock prices move to upward. Rising does not always soft rising. Sometimes excessive increase in demand boosts to prices but these excessive increases are returned in a month or similar times. When the prices again to reach to old tops, selling pressure consists of the same levels and this occurs to appearance of head of the rounding.²³⁹

Rounding bottoms are formations that are converted from the end of the decreasing trend to rising trend as a long-term. They consist of long-term chart in general. Strong buying signals, which are occurred at the same time, should be seen on the daily, weekly and monthly charts on the formed of this formation.²⁴⁰ A rounding bottom can be bull formation or continuation formation. This formation

²³⁷ M.ŞAHİN, *op.cit.*, p.71.

²³⁸ Thomas N. BULKOWSKI, *op.cit.*, p.71-75.

²³⁹ Thomas N. BULKOWSKI, *op.cit.*, p.597.

²⁴⁰ C. ALEXANDER, *op.cit.*, p.127.

occurs after the end of long-term parallel going. And it occurs with the formed stoneware appearance.²⁴¹

When the accumulation phase take place on the market, round formations occur and this is generally formed because of the professional market participants. Because these participants predict to stock prices that are cheap, and they buy to stock while the output current begins. But these investors will act to more calm to their buying order because they don't want to price is risen suddenly. Finally, stock prices move to upward with the accompanied of the increase in volume. But as this process takes a long time, the general view is like a bow or a portion of a round.²⁴²

Rounding bottoms often occur in long and flattened bottom and low-priced stocks. The completion of this formation takes to several months.²⁴³ It is investigated on the bottom point of stoneware that sometimes stocks are processed a single price due to balancing of supply and demand.²⁴⁴

The important thing here is to follow carefully in trading volume changes. To take place of price risings on the gradually weakened trading volume, trading volume rising with the declining price are acceptable as the most important signal of trend changing. There is a similar situation on rounding bottom formation.²⁴⁵

The rounding bottom formation is shown at the following chart.



Figure XXXVII Rounding Bottom Formations

²⁴¹ S. CHUA, *op.cit.*, p.109.

²⁴² L.STEVENS, *op.cit.*, p.172-174.

²⁴³ Robert EDWARDS, John MAGEE, W.H.C. BASSETTI, *op.cit.*, p.84-85.

²⁴⁴ M.ŞAHİN, *op.cit.*, p.55.

²⁴⁵ M.ŞAHİN, *op.cit.*, p.56.

Source: http://www.marketinout.com/technical_analysis.php?id=81 (04.11.10)

5.12. Rounding Top Formation

On the rounding top appearance, prices move with the small movements on the top. While trading volume is less on the left side when the top is formed, they begin to increase when switched to right side and when begin to decrease. They form in the symmetrical appearance. It is like a reverse “U” letter.²⁴⁶ Rounding top is suchlike rounding bottom but it is rarely seen. To be sure that formed of this formation, stock prices should have been historical tops and appearance of a new fundamental change, which is changed to demand and supply balance, should be observed. In this case, this formation is highly reliable.²⁴⁷

Rounding top is total opposite of the rounding bottom and it belongs to bear market. It can consist of uptrend and downtrend. The best way to gain this formation is to make short selling where the downward broken has been occurred in the formation. Percentage target will pass the area, which is placed between place that is broken is became fact, and region that is formed at the bottom of the formation. Breaking should become a fact with the strong volume.²⁴⁸

Rounding top patterns consist of four stages as formation. The first stage the dominant power is buyers and the price rises. However, despite of the rising, trading volume is a signal of weakness trend. The second stage, supply (seller) increases and this situation make balance to demand (buyer). This situation makes to prices are horizontally shaped and it provides top formation. Trading volume reaches to the lowest value of the pattern in the second stage.²⁴⁹

At the third stage, sellers begin to get the whip hand of to buyers and sales increasement continues. In this stage, trading volume begins to increase with sales. In

²⁴⁶ A.MERGEN, **op.cit.**, p.165.

²⁴⁷ C. ALEXANDER, **op.cit.**, p.131.

²⁴⁸ S. CHUA, **op.cit.**, p.109-110.

²⁴⁹ Martin J. PRING, **The Definitive Guide to Price Pattern Analysis and Interpretation**, 1st Edition. USA: Mcgraw-Hill, 2004.p.198-199.

the last stage, the model is completed with the breaking to downward of horizontal support line, which is drawn from the starting point of the model. This breakage should be with significant increase of trading volume.²⁵⁰

When deceptive distortions, which may occur in this formation, are investigated, it is seen that the volume, which is formed during the formation, may be dome-shaped instead of stoneware. But this is not a reason for the abandonment of the formation. The rounding top formation is shown on the following chart.

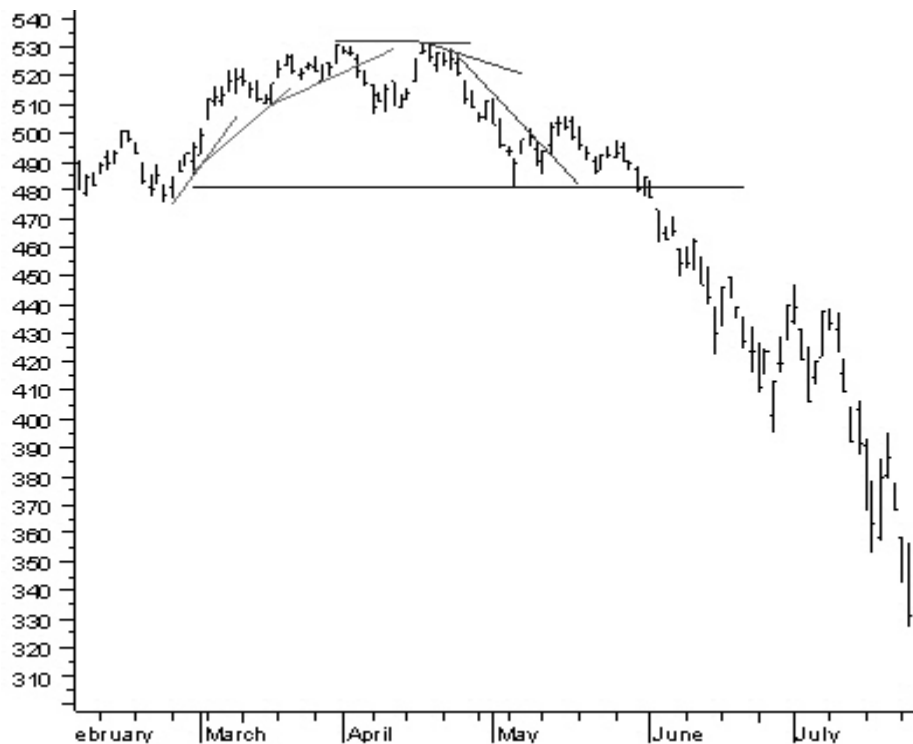


Figure XXXVIII Rounding Top Formations

Source: http://stocata.org/ta_en/patterns4.html (05.11.10)

5.13. Rectangle Formations

It is a formation that is similar in all respects to symmetrical triangle formation and just differential in respect to appearance. In general lines, which are

²⁵⁰ A.ÖZEKŞİ, *op.cit.*, p.131-132.

combined to bottoms and peaks, are parallel, but sometimes mentioned lines can be downward or upward slopping. On the level of rise flow, parallel lines, which are constituent to rectangle, can be shown to downward-slopping compared to horizontal plane. Slope sometimes becomes upward on the formations that consisted in decrease flow.²⁵¹ Prices move into channel on the rectangle formations because buyers and sellers are matched with each other. Line, which is consisted of above, indicates to resistance line that sellers are more dominant, and line, which is consisted of below, indicates to support line that buyers are more dominant.²⁵²

Rectangle formations are a continuation formation at the same time. They tend to be move in the main direction of trend. When the length of rectangle will be longer, movement which, becomes occurred after the breaking, will be very strong.²⁵³ These formations may be an indicator of a major transformation or consolidation (continuity) formations.

There are two ways to make profitable transactions on the rectangle formations. The first method is buying and selling in the channel. When the stock is closed to support level, the stock is bought and when the stock is closed towards to resistance level and stock price is increased, the stock is sold. The other method is to wait to breaking of support or resistance points and after the broken, to take the position on the financial instrument.²⁵⁴

Long formations show the better performance than the short formations. For example on the bull market, while long rectangle formations, which are broken to upward, are at the average premium of 66%, average premium on the short rectangle formations is approximately 34%. Generally, wide formations are shown better performance than the narrow formations but the difference is less. When the wide

²⁵¹ A.MERGEN, **op.cit.**, p.165.

²⁵² S. CHUA, **op.cit.**, p.106.

²⁵³ S. CHUA, **op.cit.**, p.106.

²⁵⁴ S. CHUA, **op.cit.**, p.106-107.

and length combinations of formations are investigated, the best performance is occurred long and at the same time wide formations.²⁵⁵



Figure XXXIX Rectangle Formations

Source: <http://www.learntechnicaltrading.com/IntermediaryTrading/PricePatternTrading/RectangleFormationcharts.aspx> (05.11.10)

5.14. Flag Formations

This formation is seen on the fast-moving formations. In case of need, it can take place within four or five days. Very rarely it may takes a month. Stock, which is went to upward, ease down at one point and begins to go and return seesaw into downward-sloping quadrangle which becomes short-lasting. Finalization formation will become fact at an equal rate and stock will quickly proceed on its way.²⁵⁶

Flag formations occur after a big drops or rapid increases. At this point, market has a break to its movement for a while and consolidation occurs, at the same time it is a preparatory process for the next movement.²⁵⁷ Flag formation is a formation that is created to a small secondary trend which is provided to give a short

²⁵⁵ Thomas N. BULKOWSKI, *op.cit.*, p.572-574.

²⁵⁶ A.MERGEN, *op.cit.*, p.165.

²⁵⁷ S. CHUA, *op.cit.*, p.105.

break on movement or formation correction that before prices are not came to their self main trend.²⁵⁸

A flag formation, which is taken place on daily charts, may take 3 to 5 days. But if looking at to intra-day chart, formation may take time 3 to 5 units.²⁵⁹ When formation is taken average of 3 to 4 days, a horizontal rectangle appearance can be form.²⁶⁰ For doing a process in the form of enough reliable, you have to wait that formation has got 3 terms. For creation of buying signal, closing prices should be above the prices that are referred to resistance.²⁶¹

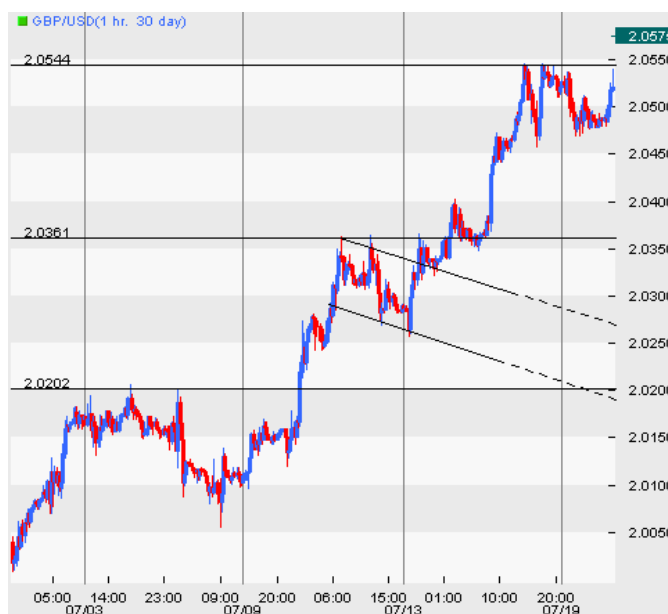


Figure XL Flag Formations

Source: http://www.investopedia.com/articles/forex/07/carry_currency.asp (05.11.10)

Reliable flag formations consist of during the creation of steep and rapid trend. The direction of the trend may be upward or downward, but decreases or increases on the prices occur too fast and the movement is completed within a few

²⁵⁸ John L. PERSON, A Complete Guide to Technical Trading Tactics, **op.cit.**, p.36-37.

²⁵⁹ John L. PERSON, A Complete Guide to Technical Trading Tactics, **op.cit.**, p.83.

²⁶⁰ Thomas N. BULKOWSKI, **op.cit.**, p.337.

²⁶¹ R. FISCHER and J. FISCHER, **op.cit.**, p.40.

days or few weeks. Flag formations often occurs the mid of major movements.²⁶² For the validity of the formation, trading volume should be too much during to increasement. During creation of the quadrilateral that represents to flag, trading volume is decreased.²⁶³ It shouldn't return without passing of distance after the breaking. The distance that is expected to go of stock after the breaking, can be calculated. Rise that is taken place before the creation of flag formation, and the total thickness of the flag equal to minimum distance that is expected to stock's direction of upward or downward, after breaking.²⁶⁴

Flag formations are more suitable for investors who want to move fast. When the studies are investigated, long formations are shown to better performance than short formations. While long formations premium at average of 35%, short formations are shown the increasement of 13%. In addition, without to flag formations that are broken downward in bull market, when all of the other formations are investigated, wide formations are shown better performance than narrow formations. The average time of flag formation is 9 to 11 days.²⁶⁵

5.15. Pennant Formations

Pennant formation is a triangle that occurs in very short term. Although it is similar to triangle formations, it is shorter than normally triangle formations and it occurs after the rapid increase of price.²⁶⁶ Pennants are expressed short-term breaks towards to trend like flags. Trading volume is very high at the origin of formation, it gradually decreases during to be formed of formation and it increases again with prices break to formation. Decreases of trading volume during to be formed of formation occur more distinctly than flag formations.²⁶⁷ Pennant formations may be

²⁶² Thomas N. BULKOWSKI, *op.cit.*, p.337-338.

²⁶³ A.MERGEN, *op.cit.*, p.204.

²⁶⁴ L.STEVENS, *op.cit.*, p.209.

²⁶⁵ Thomas N. BULKOWSKI, *op.cit.*, p.342-345.

²⁶⁶ Y.ERDİNÇ, *op.cit.*, p.320.

²⁶⁷ M.ŞAHİN, *op.cit.*, p.80.

sloped upward or downward or even it may be occurred in the form of horizontal. But often it occurs totally opposite direction of previous price trend.²⁶⁸

The easiest way to distinguish between flag formation and pennant formation; flag formation, which is consisted of on the bear market, bottom levels of prices are gradually increased while the lowest price levels on the pennant formation will be equal to each other.²⁶⁹ Creation of pennant formations usually takes to 1 week or up to 10 days.

Pennant formations are common formations and they emerge in the last phase of bull market that has been significant increase also they emerge in the second phase of bear market that decline is accelerated. Their formation time is, like to flags, between 4-5 days and 3-4 weeks.²⁷⁰



Figure XLI Pennant Formation

Source: <http://www.forextraders.com/forex-analysis/forex-technical-analysis/forex-price-action-reading-the-language-of-the-market.html> (07.11.10)

²⁶⁸ Thomas N. BULKOWSKI, *op.cit.*, p.524.

²⁶⁹ Boris SCHLOSSBERG, *Technical Analysis of the Currency Market*, 1st Edition, Canada: John Wiley and Sons, 2006, p.83.

²⁷⁰ M.ŞAHİN, *op.cit.*, p.80.

The time requirement for creation of the pennant formation is between 2 days with 3 weeks. A formation, that is lasted more than 3 weeks, can be identified as a symmetrical triangle or decreasing or increasing wedge. As a result of review, the average time of occurred pennants is 9 to 11 days. Very hard, steep and rapid change should be observed to this formation. These kind of rapid movements are very important to creation of this formation, at the same time this kind of rapid movements are a signal in terms of the recognition to this formation.²⁷¹

According to studies; long formations show better performance than the short formations, also wide formations show better performance than the narrow formations. Pennant formations are small formations. Their average length takes 9 to 11 days. The best performance is observed both length and narrow formations at the up breaking. The best performance is observed both length and wide formations at the down breaking.²⁷²

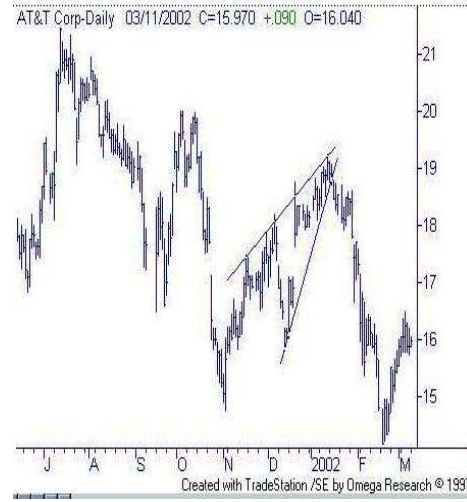
5.16. Wedge Formation

They are like pennants from all appearances and they are downward or upward slopping. Wedge formation that is upward slopping, angle of line that is combined to bottom points, according to horizontal level becomes steeper than the angle of line that is combined to peak points, according to horizontal level. When upward slopping wedge formation is broken to downward, prices are continued to rapid decline. On the contrary, stock, which is finished to downward slopping formation, will proceed to upward.²⁷³

²⁷¹ Thomas N. BULKOWSKI, *op.cit.*, p.525.

²⁷² Thomas N. BULKOWSKI, *op.cit.*, p.527-528.

²⁷³ A.MERGEN, *op.cit.*, p.208.



Falling Wedge Formation

Rising Wedge Formation

Figure XLII Falling and Rising Wedge Formations

Source: <http://www.optionetics.com/market/articles/6018> (07.11.10)

Creation time of wedge formations takes at least three weeks but rarely this time takes over the 4-5 weeks. Formations, that are lasted less than three weeks, are generally pennant formations. Trend, which is formed in volume, should be downward.

Rising wedge formations are occurred when the following conditions are taken place:²⁷⁴

- Reduction in the price is seen on the stock markets.
- Resistance lines of long-term trends are dropped in the form of to show a stable sale with the same continuously angle.
- When angles of trend lines, which are drawn for support, are compared to angles of resistance lines, they are more horizontal than the angles of resistance lines. This is one of the signals of rising purchasing appetite. Some

²⁷⁴ G. APPEL, *op.cit.*, p.70.

people collect to stock from the market. Finally, downtrend and uptrend lines are combined. When the formation is progressed, the volume decreases.

This formation shows that sales pressure is unchanged constantly and buying force is more and more strong. This formation has bull market potential.²⁷⁵

The best way to make profitable transactions on the wedge formations is to wait of upward or downward broken creation. After breaking of falling wedge formation, a long position should be taken and rising wedge formation a short position should be taken. On this transaction, the stop-loss point should be last support point on the downward-slopping formations and it should be the last resistance point on the upward-slopping formations.²⁷⁶ To make sure before breaking of the falling wedge formation, the 3 peak creation should be waited. On the other hand, to make sure before breaking to rising wedge formation, the 3 bottom creation should be waited. In addition, when the falling wedge formation is compared to rising wedge formation; it is observed that falling wedge formation is consisted faster.²⁷⁷

Long formations show better performance than short formations on the falling wedge formations. Also, long formations show better performance than short formations on the rising wedge formation. When the wide formations are compared with narrow formations on the falling wedge formations, they are shown equal or better performance than the narrow formations. On the other side, when the wide formations are compared to narrow formations on the rising wedge formations, they show better performance than the narrow formations except of downward broken that are occurred in bull market. Time of creation of formations is not longer than 4 months in declining wedge formations and the average time doesn't pass 2 months. On the other side, the time of creation of formations is 44 days.²⁷⁸

²⁷⁵ G. APPEL, *op.cit.*, p.71.

²⁷⁶ S. CHUA, *op.cit.*, p.105.

²⁷⁷ R. FISCHER and J. FISCHER, *op.cit.*, p.40.

²⁷⁸ Thomas N. BULKOWSKI, *op.cit.*, p.798-822.

5.17. The Gaps

Its stock market lexical meaning is a price region that buying and selling is not became fact. Due to the fact that balance couldn't be established between buyers and sellers, stocks are opened above the previous day's highest level during to intraday trading and they go up even more, or stocks are opened to low price where environments that sellers are predominated. In this case, price gaps are occurred above charts.²⁷⁹

In general, gaps consist of the effect from news while the market is closed. While positive news are raised to number of buyers and purchasing power, negative news are raised to number of sellers and sales force.²⁸⁰

The price gaps, that become fact on the stock chart, are formed for three reasons. They try to explain below.²⁸¹

- The first of these, to be processed of stock on two or more centers and processing times between these centers are time difference between starting and end hours. When the processes are closed a certain price in a centre, these price movements affect other centers and cause to creation of price gaps. Gaps, which occur for that reason, are called arbitrage gaps.
- The second reason becomes reality of important developments about the company that affects to company's stock price into start-up and closing time. Therefore, prices are opened to different shaped that created to gap from previous day's closing price.
- The last reason is related with trading volume, which occurs intraday, to be low.

Technically, while gaps, which are occurred in the uptrend, signal to robustness of the market or a strong demand, gaps which are occurred in the downtrend, are

²⁷⁹ A.MERGEN, **op.cit.**, p.208.

²⁸⁰ S. CHUA, **op.cit.**, p.88.

²⁸¹ F.TOMAKIN, **op.cit.**, p.115.

technical formations that are signaled to the weakness of the market or a power supply. Gaps usually consist of daily charts. Rarely, they can be seen on the weekly charts. Gaps, which are formed on the weekly charts, technically have got a great importance.²⁸²

Gaps, which have a place in about the future price in terms of technical analysis, are divided into four classes. These are; common price gap, breakaway price gap, runaway price gap, and the exhaustion price gap.

5.17.1. Common Price Gaps

In technical terminology, common gaps are types of gaps, which are usually occurred in anxious markets and they are referred in the form of style movements that gaps are closed within a few days or within maximum of one week.²⁸³ They may occur at any time. Generally they consist of on the horizontal unstable markets or on the compressive areas. Their prediction can be difficult.²⁸⁴

Common gaps refer that prices are in the digestive region. It is often possible to see to these gaps during the creation of triangles and rectangles price models. These gaps signal that prices are not caused to a trend changing and they are continued to direction of existing trend. Except of this, they don't provide more information on technically.²⁸⁵

²⁸² Martin J. PRING, **op.cit.**, p.103.

²⁸³ Richard W.SCHABACKER, **op.cit.**, p.159.

²⁸⁴ C. ALEXANDER, **op.cit.**, p.24.

²⁸⁵ Y.SARI, **op.cit.**, p.167.

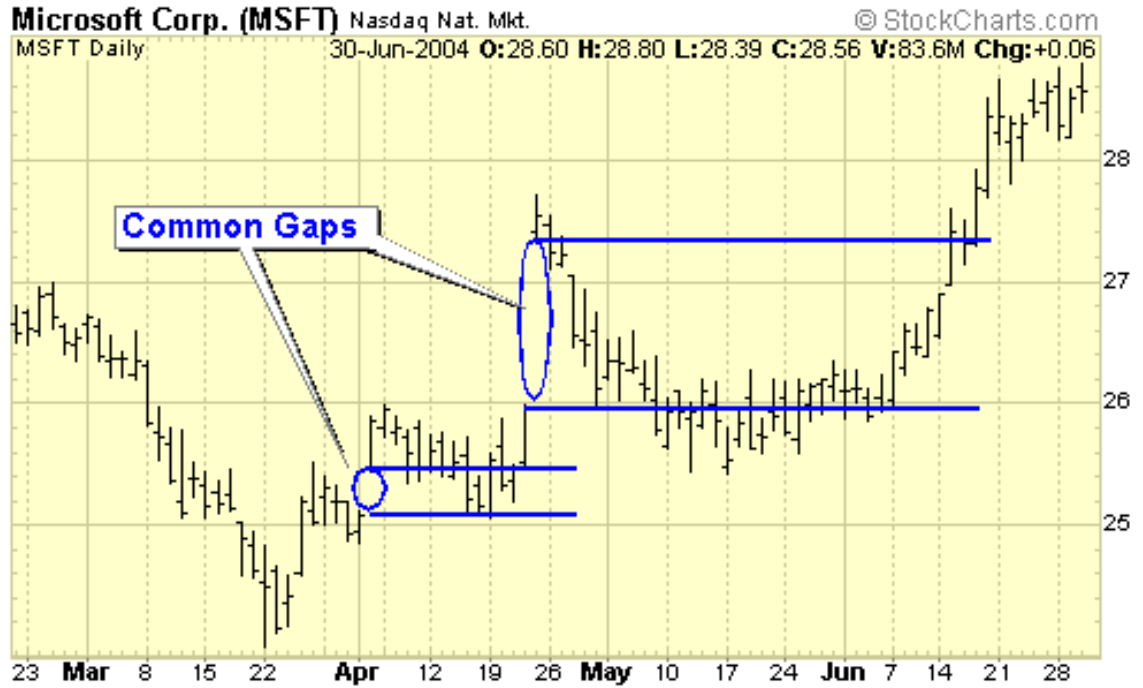


Figure XLIII Common Price Gaps

Source: http://stockcharts.com/help/doku.php?id=chart_school:chart_analysis:gaps_and_gap_analysis
(08.11.10)

5.17.2. Breakaway Price Gaps

They occur when the prices are broken to trend line or a formation. These formations are postponed formations such as descending or ascending triangle formations that have generally horizontal limited lines.²⁸⁶

Breakaway gaps stress trend stability that is toward to breaking of prices. In this direction, they give signal to the beginning of rapid price movements. These kind of gaps refer to purchasing power is higher than sales on the up breaking, they express opposite situation in the downward breaking. In this regard, price breakings,

²⁸⁶ M.ŞAHİN, *op.cit.*, p.88.

which are occurred with gaps, show the direction of prices in a more reliable way when compared with normally formed breakings (without creation of gaps).²⁸⁷

According to some statistical studies, the closing times of formed breakaway gaps vary between 2 months (61 days, the bear market, breaking up) with 6 month (168 days, bulling market, breaking down). Breakaway gaps can not close very quickly. Even after a year, breakaway gaps still remain open. In addition, breaking gaps on the bull market is bigger than breaking gaps on the bear market. Formations, which have big breakaway gaps, are shown to better performance than formations, which have small breakaway gaps.²⁸⁸

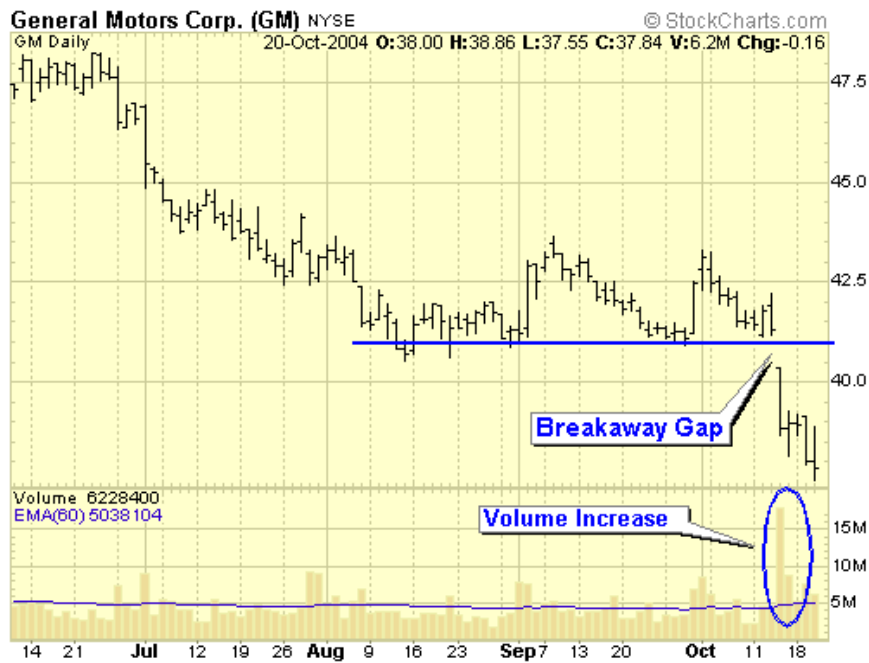


Figure XLIV Breakaway Price Gaps

Source: http://stockcharts.com/help/doku.php?id=chart_school:chart_analysis:gaps_and_gap_analysis (08.11.10)

²⁸⁷ M.ŞAHİN, *op.cit.*, p.89.

²⁸⁸ Thomas N. BULKOWSKI, *op.cit.*, p.366-368.

5.17.3. Runaway Price Gaps

Runaway gaps occur in the middle of very rapid price increase or decrease. These gaps are indicators that confirm the direction of short-term trend. In addition, they refer to strength of trend in the emerging market and they refer to the weakness of the trend declining market.²⁸⁹

Trading volume is generally at normal levels in this kind of gaps. If runaway gaps become fact on the high trading size (just before the gap occur, not after), it is confirmed as an indicator of strength of this trend.²⁹⁰

It is acceptable that, prices will be increase or decrease up to distance, which is until the gap, after the gap. If two gaps occur during rapid ascension (or decrease), the middle of two gaps is considered as the half of ascension.²⁹¹

When breakaway gaps are compared to runaway gaps, runaway gaps much more easily filled. Breakage may occur at the latest within 3 months. The latest closed up breakages which are occurred in bull market.²⁹²

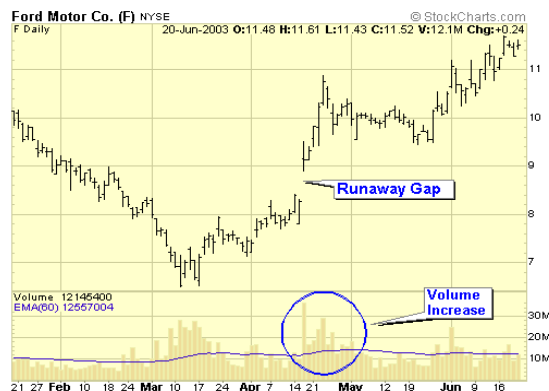


Figure XLV Runaway Price Gaps

²⁸⁹ M.ŞAHİN, *op.cit.*, p.91.

²⁹⁰ M.ŞAHİN, *op.cit.*, p.91.

²⁹¹ M.ŞAHİN, *op.cit.*, p.91.

²⁹² Thomas N. BULKOWSKI, *op.cit.*, p.369-370.

Source: http://stockcharts.com/help/doku.php?id=chart_school:chart_analysis:gaps_and_gap_analysis
(08.11.10)

5.17.4. Exhaustion Price Gaps

Exhaustion gaps give a signal to the end of rising or declining. In here, prices rise but immediately after their rising speed is cut and they meet an intense resistance. After the gap, price risings meet intense supply and they reach to high trading sizes. Although trading size rises, prices wouldn't be a remarkable ascension.²⁹³

After these gaps, a price formation is formed or trading interval is formed. After this, prices move towards to trend or opposite to trend. Even, exhaustion gaps are frequently found before the “key reversal trend day” that is expressed to the end of short-term trend.²⁹⁴

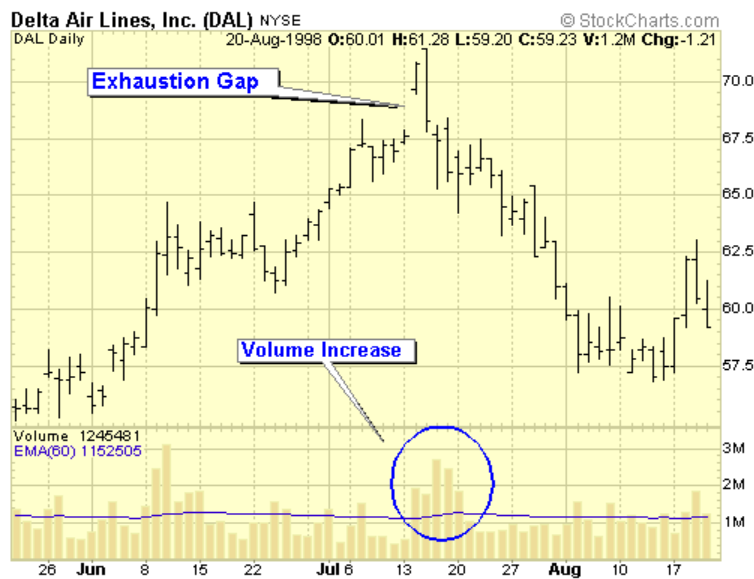


Figure XLVI Exhaustion Price Gaps

Source: http://stockcharts.com/help/doku.php?id=chart_school:chart_analysis:gaps_and_gap_analysis
(08.11.10)

²⁹³ M.ŞAHİN, *op.cit.*, p.92-93.

²⁹⁴ M.ŞAHİN, *op.cit.*, p.93-94.

PART VI

INDICATORS IN TECHNICAL ANALYSIS

6.1. General Description

Technical analysts begin to develop the new technical analysis methods, which process in the form of healthy, consistent and stable way, with the development of technology. These new technical analysis methods, which are developed for trading purposes, are called as indicators in technical analysis.²⁹⁵

The interpretation and plotting of technical graphics, which are developed a number of statistical formulas by taking advantage of past prices, has an important place as well as the interpretation of consisted price charts and models. Aforesaid models are called as indicators. The establishment and interpretation of these indicators constitutes one of the most important parts of technical analysis. The main objective of the development of these indicators is able to predict the direction of prices. The establishment and interpretation of the indicators require to a good knowledge and accumulation of technical analysis.

Technical indicators sometimes are shown with the histograms or dashed lines. However, if it is desired, indicators can be drawn on the price charts. Every technical analyst creates their own technical indicators under favor of their experiences and knowledge. Today these processes can be very simple way under favor of technology, computer and technical analysis software packages.

Technical indicators are generated and improved form by formula of determined periods to any property or securities' all trading volume and price data. These indicators give a warning signal as a result of price movements, which take

²⁹⁵ A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Canım Sende!* 3, 1st Press, İstanbul: Scala Yayıncılık, 2002, p.19.

place, and these signals give hint to investors about the future direction of prices by their interpreted in the form of buy or sell.

These signals can be evaluated different as a result of experiences gained by the technical analysts. However, technical indicators, which are pre-determined and accepted, have the same meaning and produce the same signals by each investor or analyst.

In technical analysis; when the time (period) of analysis becomes shorter, the possibility of errors on the predictions increases. Therefore, the indicators used in technical analysis can be divided into two separate classes as a short-term and medium- term indicators. Short-term indicators are used for to receive the supporting information to estimate the direction of prices and they are used for providing short-term capital gain. On the other hand, medium-term indicators are used for to determine the trend of stock prices.²⁹⁶

While the technical indicators are prepared, past price data are used. Most of indicators are established by using the past trading volume data with the data such as opening, closing, highest and lowest price. Weighted or called as mid-price data is used on some indicators. A large majority of technical indicators create moving averages. For that reason to examine and explain the moving average and its usage for technical analysis should be necessary before the passing of technical indicators.

6.2. Moving Averages

Moving averages are used frequently in the technical analysis. They are at the same time consisted to basis of many indicators. Moving averages are consisted the essence of used trend tracker mechanical systems.²⁹⁷ Moving averages is a technique that used to see a real trend and tendency by eliminating to fluctuations, in the other

²⁹⁶ A. ÖZEKŞİ, *op.cit.*, p.165-166.

²⁹⁷ A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Canım Sende! 3*, *op.cit.*, p.22-25.

words it is used for to correct of data.²⁹⁸ Moving averages are basically three main functions.

- To determine the trend direction of prices or market.
- To provide determine of main trends by eliminating small oscillator that done by prices in the other words it is a correction function to prices.
- To determine the peak and bottom points of prices.²⁹⁹

Main function of moving averages in terms of technical analysis is that it shows direction and severity of changes that are consisted of buyers and sellers preferences during the selected periods. In other words, it helps to investors on their buying-selling decisions by showing to direction of supply and demand, which is created to fluctuation of price.³⁰⁰

Stock closing prices are commonly used for the calculation of the moving average. However, the highest and the lowest price of the day also can be used according to preferences of the person. One of the most important problems on the moving averages is the selection of the period. Applied period may give different result in each stock or index. For that reason appropriate time period should be determined for the stock or index by benefiting from past price data.³⁰¹

Usually 5 time interval (period) is used on moving averages at the stock markets. These are as follows:

Time Intervals	Term
5-13 Days	Very Short-Term
14-22 Days	Short-Term
23-49 Days	Medium-Term
50-99 Days	Medium-Long Term
100-300 Days	Long-Term

²⁹⁸ G. KARAŞIN, **op.cit.**, p.89.

²⁹⁹ A. PERŞEMBE, **Teknik Analiz Mi Dedin? Hadi Camm Sende! 3**, **op.cit.**, p.22-25.

³⁰⁰ G. DAGNINO, **Profiting in Bull or Bear Markets**, USA: McGraw-Hill, 2001, s.203.

³⁰¹ F. ÖZÇAM, **op.cit.**, p.98.

Investors, who invest very short-term or traders generally use very short-term averages such as 5 days while medium-term investors use to 22-50 daily averages. On the other side, investors who invest long-term, use to 100 and 200 daily averages because these averages show trend changes more clearly. When the used time interval is increased on the moving averages, oscillators of prices become soft. 200 daily (40 weeks) moving averages are generally used on the main trend analysis and Dow Theory.³⁰²

Meanings of moving averages in terms of technical analysis can be sorted as follow:³⁰³

- While a rising moving average refers to stability of the market, a falling moving average represents to weakness of the market.
- Moving averages show to trend of prices in the selected period and moving averages is a support or resistance level function because they correct to extreme movements of prices.
- Because they are a support or resistance level function, broke down or up of prices are accepted as a signal of trend changing. While short-term moving averages are passed by the prices are a signal to short-term trend changes, to breaking of long-term moving averages is a signal of main trend change. Also, to start the changing of the direction of moving average is accepted a signal of a trend change.

200 daily moving averages are used frequently in Dow Theory and main trend changes. Also it is an indicator that used by long-term investors in ISE. Granville is

³⁰² A. ÖZEKŞİ, **op.cit.**, p.170.

³⁰³ M.ŞAHİN, **op.cit.**, p.135-136.

ranked in 8 basic rules for using of 200 daily moving averages.³⁰⁴ These are as follows:

- If 200 daily moving averages straight line is flattened or risen after the previous falling and stock prices are broken up to average, this is an important buy signal.
- If 200 daily moving averages are below the average of price while average straight line rises, it is a chance for buying.
- If stock prices is on the 200 daily moving average straight line and it closes to average straight line by falling and then it raises again this is a buy signal.
- If the stock price rapidly falls and it is below to 200 daily average straight line stocks can be taken for this short-term rising.
- If 200 daily moving averages straight line has flattened or begun to decline after the previous rising and stock prices are broken down to average, this is an important sell signal.
- If the price is above to 200 daily moving averages while average straight line declines, it is evaluated as a sell signal.
- If the stock prices is below the 200 daily moving average straight line and it closes to average straight line by rising and it falls again this is a sell signal.
- If the stock price rapidly increases and it is above to 200 daily average straight line stocks can be sold for this short-term declining.

Moving averages are the most used and most reliable technical indicators. In summary, technical analysts recommend to taken stock or property on the moving average methods to following cases:

- If the moving average chart is flattened and stock price pass to upward to moving average,
- If stock price cut to downward to motion chart line that is risen,

³⁰⁴ Joseph E.GRANVILLE, **A strategy Of Daily Stock Market Timing For Maximum Profit**, USA: Prentice -Hall, 1969, p.237-238.

- If stock price first declines while it is on the moving average chart line but it begins to rise again without any contact with the line, these situations are evaluated as buy signal.

Technical analysts recommend to selling for the following situations:

- If the stock price passes downward to chart line, while the chart line goes parallel with the horizontal axis,
- If the stock price passes to upward to moving average straight line that tend to be falling
- If the stock price is below the moving average chart line then it begins to increasement and it falls again without reach to the moving average, these situations are evaluated as a buy signal.

Moving averages generally are classified as three parts according to their calculation methods. These are simple, weighted and exponential moving averages. Recently, triangular and variable moving averages are also used. But these averages were not explained because they are not used more.

6.2.1. Simple Moving Averages

All values in the selected time period has the same importance in this moving average method. For example, at the calculation of 22 daily simple moving averages, the last 22 day closing price values are collected and the resulting values are divided to 22 and the result of division 22 daily moving averages are calculated.

Although simple moving averages are the most commonly used, it can be incorrect results on the long-term calculations because it gives to same importance to data that are placed in the period.³⁰⁵

³⁰⁵ Y.SARI, **op.cit.**, p.6

6.2.2. Weighted Moving Averages

The aim of this method is able to calculate to a moving average that is reduced the importance of early days of data and given weight to recent data.

Weighted moving average calculation is very simple. For example 5 daily weighted moving averages calculation is like this: the last day's data multiply by the 5 then the fourth day's data multiply by the 4, the third day's data multiply by 3, the second day's data multiply by the 2 and the first day's data multiply by 1. After this, all of these results are collected. These values are divided by the 15 ($1+2+3+4+5$), which are multiplier values, so 5 daily moving averages were found.

Critic can be done that this calculation method is disregarded to early days and this method is ignored to relation between last day price and early day price of the period. In addition, although this method is seen more meaningful than the simple moving averages and this method gives more effective results on the short-term moving averages, it should not be overlooked that this calculation may be increase the rate of incorrect results.³⁰⁶

6.2.3. Exponential Moving Averages

Exponential moving average is a moving average calculation method that although they give more importance to the last days, they do not neglect the first days. Although its calculation method looks like more complicated than the other two methods, it is a method that its calculation is not hard to do because it is an approach that the first stage of its calculation after the calculation of simple moving average, make addition on it.

After determining the period used this method, an exponential factor is determined. This multiplier is calculated by dividing the number of two to selected period. In this method the number of two is fixed and all exponential values are obtained by dividing number of two to selected period. However, exponential factor

³⁰⁶ A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Canım Sende!* 3, op.cit., p.37-38.

is calculated $2/n+1$ (n is the selected period) by some technical analysts. For example for 5-day exponential moving averages, the exponential multiplier is $2/5=0.40$; for 50-day exponential moving averages, the exponential multiplier is as calculated $2/50=0.04$. According to $2/n+1$ approach for 15-day exponential moving averages, the exponential factor is calculated $15+1=16$, $2/16=0.125$.

Moving averages are calculated in different ways as a tendency, but in practice they show small differences. While simple moving average is more remote crossing to price chart, on turns their encounter with the price chart is late and they give signals too late. Weighted moving averages may give signal very early even the sudden movements of prices because they come closer to last days' prices. The differences between the averages is less on the short-term period, on the other hand the differences between them may indicate a noticeable improvement.³⁰⁷

6.3. Bollinger Bands

Bollinger bands were developed by John Bollinger.³⁰⁸ Bollinger band (moving average channel) is rather than a technical indicator, it is created with moving averages, prices are showed to oscillation with certain limits and these limits are used as a trading band and when these limits are exceeded, they gave a signal that prices will continue in the direction is its divided into bands.

Sum up the calculation of Bollinger band, it is calculated as it is described using the moving average. Moving average, which will be used on the calculation of band, is calculated to obtained mid-price that is collected to the day's lowest, highest and closing price and the result divided by the three. Moving average in selected period is calculated each day's mid-price. John Bollinger is used to 20-day moving average as a period for calculating to moving average. After selecting to period, standard deviation of period is calculated. Narrower or expansion of lower and upper

³⁰⁷ Y.SARI, **op.cit.**, p.6

³⁰⁸ John J. Murpy, Görsel Analiz, **op.cit.**, s.99.

bands depends on the standard deviation. Accelerated price movements make to expand of band, on the other hand the band narrows.³⁰⁹

Usage and interpretation of Bollinger band is easy. Bollinger bands are used in two ways by traders. The bottom line of band is considered as support point for prices and when prices reached to this point, it is evaluated as purchase opportunity. Upper line of band is considered as resistance point and when prices reached this point, it is evaluated as sales opportunity. In the second method it is expected to prices break to bands from the bottom and up. The logic in here, a big trend will begin to the price break with band in a direction. It is assumed that prices are in what direction the Bollinger bands broken, the prices movement continues in that direction and prices are in which direction the bands broken, position is taken in that direction.³¹⁰



Figure XLVII Bollinger Bands

Source: <http://support2.dundas.com/OnlineDocumentation/webchart2005/bollinger.html> (01.12.10)

³⁰⁹ Robert W. Robert, *The Encyclopedia of Technical Market Indicators*, 2nd Edition, USA: McGraw-Hill, 2002, p.114.

³¹⁰ A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Canım Sende!* 3, op.cit., p.37-38.

Interpretation of Bollinger bands can be summarized briefly as follow:³¹¹

- Gradual and sudden increasement of Bollinger bands is a signal of important price changes. This is the most important one and should be considered as characteristic of Bollinger bands. Although it would be hard to predict what direction prices, the direction of prices can be estimated using other indicators such as MACD.
- Going out of prices from the Bollinger band is a signal that prices will go on to the direction at the Bollinger bands' broken point and this is evaluated as buy signal.
- During the ascension trend, to back into the band after the prices is peak by moving out of the band and when the second peak practices into Bollinger band, it is interpreted as a signal of trend is entered into falling tendency and this is evaluated as sell signal.

6.4. Short-Term Technical Indicators

Short-term technical indicators are used for short-term trading in technical analysis. When analyzed data periods become shorter, error rate may be higher than long-term analyzes. Because during the day prices are very active and investors may be affected positive or negative news even the news are smallest. Therefore, when analyzing short-term technical indicators, it should be on the safe side.

Short-term technical indicators cover a few days up to 30 day periods that are used depending on the time. Short-term technical indicators can be calculated from closing price, the lowest or the highest price in selected time period.

The most important factor that should be considered on the short-term technical indicators is prices play along with the indicators. Also, incompatible movements between them should be considered. If there is inconsistency between

³¹¹ M.ŞAHİN, *op.cit.*, p.135-136.

price and indicators' peak and bottom points give a signal that prices are fit to direction of indicator after a short period of time.

As selected period is shorter in technical analysis, so indicator produces more to buy or sell. This has both advantage and disadvantage. The advantage is; investors have the opportunity to catch the peak and bottom points. The disadvantage is; investors have more risk. Failure increases. However, these indicators are commonly used indicators by traders who invest short-term.

6.4.1. Momentum Indicator

The concept of momentum was examined first in Welles Wilder's 1978 printed book that was named as "New Concepts in Technical Trading Systems". It is the most widely used indicators by technical analysts and investor due to the fact that it is an indicator that simple also it can be used both trend and horizontal markets.³¹²

Momentum indicator can define as speed rate or rate of price changes.³¹³ Momentum reflects to exchange between the current price and n days before price. Momentum indicator is commonly used by technical analysts because it formulated in pace of price change, trend's power and speed. Momentum indicator can be calculated with closing price, moving average value or price change percentages. Indicator that is calculated with price change percentages also called as rate of price change and it is followed as a separate indicator that is called as ROC (Rate of Change).

Momentum can pre-show price changes because it compares today's prices with past prices. It is served as an early warning indicator because it is a short-term indicator. Points that trend return up or down can be pre-determined by monitoring to momentum indicators.³¹⁴

Computation of the momentum indicator is easy. Formula is as follows:

³¹² A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Camm Sende! 3*, op.cit., p.27.

³¹³ Ö. KILIÇAY, op.cit., p.145.

³¹⁴ Y.SARI, op.cit., p.61.

$$\text{Momentum} = \text{Current Closing Price} / \text{Previous Closing Price} * 100$$

The reference value of the indicator is 100. This is neutral value of indicator. In general, the calculation of momentum is used 10, 12 and 14 daily values for short-term and it is used between 20-28 periods for long-term calculation.

When momentum indicator upward breaks to 100 reference line, it is estimated as buying signal and when momentum indicator cut down to 100 reference line, it is estimated as sell signal.³¹⁵

If momentum indicator is above the 100 reference line, these show that prices are increased according to the n day before. If momentum indicator is above the 100 reference line but it has decrease tendency, this situation expresses to prices are closed to n day before values but prices are higher than the n day before values. If momentum indicator is below the 100 reference line and it has decreased tendency, this situation expresses that prices are lower than the n day before values and it gradually decreases below in this level.³¹⁶

Application method of momentum indicator can be listed as follow:

- If the indicator cut up to 100 reference level it is considered buying signal and if the indicator cut down to 100 reference level it is considered as sell signal.
- Indicator can be used as excessive buying and selling indicator by determining to two levels that are placed below or on the 100 reference level.
- If indicator cut up to short-term average, it is used as buying signal and if the indicator cut down to its short-term average, it is used as sell signal.
- The last application method on the indicator is trend lines. It is possible to obtain information about the direction of prices by drawing to trend lines on the momentum indicators. To break of ascension trend on the indicator is

³¹⁵ A. PERŞEMBE, **Teknik Analiz Mi Dedin? Hadi Canım Sende! 3**, op.cit., p.152.

³¹⁶ Robert W. COLBY, **The Encyclopedia of Technical Market Indicators**. 2nd Edition. New York: McGraw-Hill, 2003, p.401

used as sell signal and to break of descending trend line is considered as buying signal.



Figure XLVIII Momentum Indicator

Source: <http://www.onlinetradingconcepts.com/TechnicalAnalysis/Momentum.html> (01.12.10)

6.4.2. Relative Strength Index (RSI)

Relative strength index was developed by J. Welles Wilder. This indicator was first explained in Wilders' 1978 printed book that named "New Concepts in Technical Trading System".³¹⁷ Relative strength index is an indicator that revealing to share's own strength as well as momentum index. Relative strength index can be summarized as comparing between the past days of prices rise and decreased days of prices.

Relative strength index is a short-term indicator and it is an important indicator that shown to short-term direction changes. RSI is an indicator that controlled to short-term excessive ascension and reduction movements. Indicator shows to oscillation between 0-100 values. It is like a price oscillation indicator. J.

³¹⁷ Martin.J. PRING, **op.cit.**, p.211.

Welles Wilder was determined to 70% area of indicator is excessive buying region and 30% area of indicator is excessive selling region. 50 level of indicator is a level that balanced of power. Indicator gives important clues on the short-term trend changes. Mathematical formula of this indicator as follows:³¹⁸

$$RSI = 100 - 100 / (1 + RS)$$

$$RS = AG / AL$$

AG = Average Gain over RSI Period

Gain = Price - Price.x (when Price > Price.x)

AL = Average Loss over RSI Period

Loss = Price.x - Price (when Price < Price.x)

x = Momentum Period

Number of days (period) is determined before the calculation of the relative strength index. Wilder was advised that this period is as 14 day. However, it is possible to use longer or shorter periods. When the number of days becomes decrease, indicator is more sensitive but depending on this, the number of faulty signal is increased. As period is selected longer, the reliability of signal is increased.³¹⁹

³¹⁸ Robert W. COLBY, **op.cit.**, p.610.

³¹⁹ A. ATEŞEN, **op.cit.**, p.58-59



Figure XLIX Relative Strength Index

Source: <http://www.onlinetradingconcepts.com/TechnicalAnalysis/RelativeStrengthIndex.html>
(01.12.10)

RSI indicator can produce to incorrect signals from time to time although it is a successful indicator. Although this indicator started to rise, prices can go down for a while or although indicator turns to downward, prices may continue to rise upward for a while. If indicator is creating to erroneous signals very often, erroneous signals can be reduced by changing to period of indicator. Such errors are usually shown when the indicator passed to 30 and 70 level.³²⁰ Finally, to get the best performance from indicator, indicator should be used on horizontal market and excessive buying and selling signals should be taken into account.

³²⁰ Y.SARI, *op.cit.*, p.82-91.

6.4.3. Stochastic Indicator

This indicator was developed by George Lane.³²¹ Stochastic indicator is used very common by traders who trade in short-term period. This indicator is an oscillation indicator and it is an indicator that determines to excessive buying and selling regions of prices.

Stochastic indicator is based on the relationship between current closing values with n. day's the highest and the lowest value. The same logic is used on the RSI. The difference between them is that; although momentum is measured on the RSI, two curves that are called %K and %D values are used on the stochastic and according to positions of these curves analysts are determined to prices' excessive low or high.³²²

Stochastic indicator is drawn to two lines that oscillating between 0 and 100 values. Values refer to percentage change. A period should be determined on the stochastic indicator. George Lane was proposed to 5-day period for %K, also he was proposed to 3-day simple average for moving average of this value.³²³

The first value on the calculation of indicator is called as “%K period” and it is plane state of the indicator. Defined as “%K slowing period” is a moving average that is used for correct to %K term. %K slowing period is drawn on chart with bold solid lines. The second indicator is named as “%D period” and it is moving average of %K slowing period and it is drawn with indicator. It is shown on the charts with more subtle or discrete lines. It needs to three separate values such as 5, 3, 3, or 15, 5, 3 because it is calculated from three different ways. The first value is the number of selected day. The second value is the average (%K slowing period) and the third value is the mean of the average, in other words it gives to %D value. The average number that will create %D line should be smaller than the average number that will

³²¹ Mark L. LARSON. **Technical Charting For Profits**. USA: John Wiley & Sons, Inc., 2001, p.122.

³²² A. MERGEN, **Kurtlarla Tango (Süper Teknik Analiz)**. 1st Edition İstanbul:Mergen Yayınları, 1993, p.139-140

³²³ M. KATLANDUR, **Borsada Basarı**. 1st Edition. İstanbul:Ekin Matbaacılık, 2001, p.232-233

create %K slowing period. The formula of the stochastic indicator and calculation for 5-day is given as follow:

$$\%K = (\text{Current Close} - \text{Lowest Low into 5 Day}) / (\text{Highest High into 5 Day} - \text{Lowest Low into 5 Day}) * 100$$

The indicator that is placed to above formula is Fast Stochastic Indicator.³²⁴

If the indicator curves pass to 80 levels on the upper regions, it is evaluated as excessive buying region and if the indicator curves come under to 20 levels, it is evaluated as an excessive selling region. These values are generally accepted values. These regions can be determined lower or upper according to analyzed stocks. The interpretation of this indicator is divided into 3 basic methods.³²⁵

The first method for the interpretation of the stochastic indicator is boundary lines that are drawn on the upper and lower regions of the indicator. To reach of stochastic indicator to 0 and 100 values is possible situation. To decrease in the zero level of stochastic represents to closing prices are the lowest price level in the selected period. To come out of stochastic from the 100 level refers to closing prices are reached to the highest level in the selected period.

The second interpretation method is, to intersect of the %K and %D curves. If %K curve cuts up to %D curve, it is accepted as buying signal and if the %k curve cut down to %D curve, it is accepted as sell signal.

The latest method is non-compliance analysis. Positive non-compliance between prices and indicator is evaluated as prices will increase and negative non-compliance between prices and indicator is evaluated as prices will decrease for a while.

³²⁴ Y.SARI, *op.cit.*, p.36-38.

³²⁵ M.ŞAHİN, *op.cit.*, p.173.

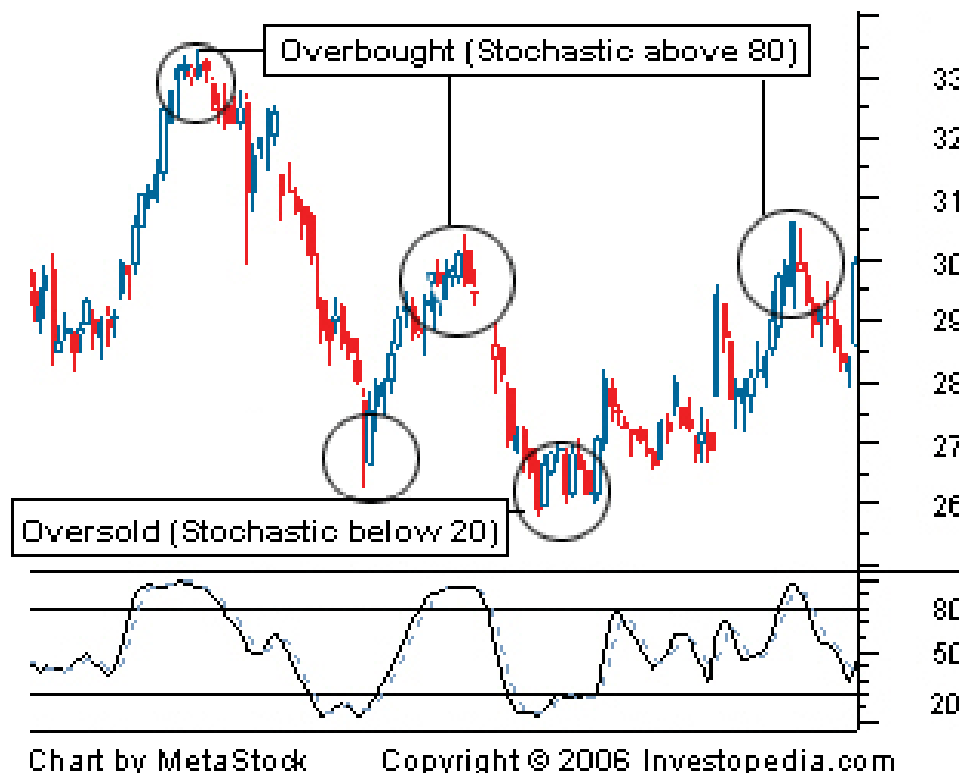


Figure L Stochastic Indicator

Source: <http://www.investopedia.com/terms/s/stochasticoscillator.asp> (02.12.10)

6.4.4. Commodity Channel Index (CCI)

Commodity Channel index indicator was developed by Donald Lambert and it was introduced Commodities magazine in October 1980. Although Lambert was developed this index for using in the commodity markets, this indicator is used in a way quite successful on the stock market.³²⁶ Lambert was observed as a result of lengthy investigations on the commodity markets, prices are again returned to their lowest levels after their ascension every twenty days. Lambert has been determined to approximately 11 days of this time is ascension and the other 11 days are decreased days. The result of this detection, Lambert has been developed CCI indicator that is calculated 11-day period. However, Lambert has been recommended to using of this period between 5 and 25 days for CCI indicator due to 11-day period

³²⁶ John J. MURPHY, *Technical Analysis of the Future Markets*, op.cit., s.237.

do not fit to all the time for all commodity market and stock. Usually 20 daily periods are used on the indicator for stock at the graphic programmes.

The reference values of the indicator are -100 and +100. Indicator usually moves between these reference values. If the indicator ups the +100 level, it is used as buying region and if the indicator declines below the -100 level, it is used as selling region.

Commodity channel index can be calculated from closing prices also it can be calculated at mid-price that is found by collecting to the day's lowest, highest and closing prices and founding result is divided by three. The aim of the calculation of indicator is; try to find the difference between prices and their simple average. In addition; deviation of simple moving average is used for calculation of the indicator.³²⁷

General formula of the CCI indicator is given below. Coefficient of 0.015 in the formula is used in all calculations as the standard.³²⁸

Typical Price= (The Highest Price of a Day + the Lowest Price of a Day + Closing Price) / 3

Deviation= Typical Price- Moving Average of Typical Price

Deviation Average= Total Deviations / Period

CCI= Deviation/ Deviation Average *0.015

The biggest problem on the short-term indicators such as CCI is period. Although 20-day period is used on the graph programmes for CCI, it is possible to use different periods. To extend the period may lead to signal delay and to keep period short can lead to take to unnecessary buy-sell signal. For that reason, the best way to find the appropriate period is to test backwards on analyzed securities or

³²⁷ Y.SARI, **op.cit.**, p.51-55.

³²⁸ Robert W. COLBY, **op.cit.**, p.610.

stocks to indicator with the different values. There are few comments of the indicator method.

- +100 and -100 values are used as a reference value on the indicator. If the indicator passes up to +100 values, it means that excessive buying region and this situation gives to prices are immediately will went back. On the other hand, if the indicator passes in to -100 values, it means that it is excessive selling region and this situation represents to prices can immediately returned up.
- The other method is related to using of 0 reference line. If the indicator cuts up to 0 reference line it represents to buy signal and if the indicator cut down to 0 reference line it refers to sell signal.
- Another method is incompatibility between prices and indicator. Detection and interpretation to incompatibility on the indicator is like to RSI and Momentum.
- The last method is using indicator by drawn to trend lines on the indicator. Here, broken of trend lines are used for buying and selling. In other words; when the ascension trend that drawn on the indicator is broken, investors should sell and when the downtrend is broken, it is evaluated as buy signal.³²⁹

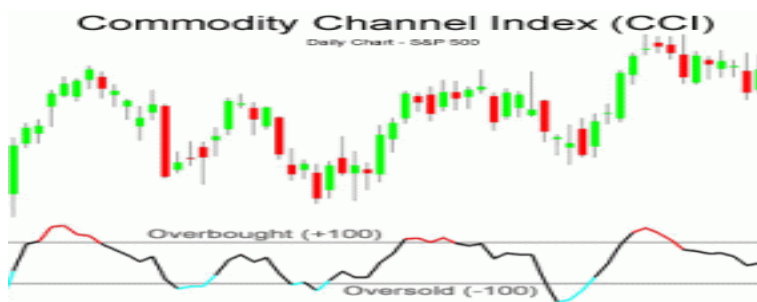


Figure LI CCI Indicator

Source: <http://forextradingstrategiessystems.com/tag/relative-strength-index/> (02.12.10)

³²⁹ A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Canım Sende!* 3, op.cit., p.129-130.

As a result, CCI indicator is able to provide successful results on the stock markets and especially periods that are horizontal price movements. However, appropriate periods should be found to analyzed stocks or securities for taking advantage of the indicator. To note that this indicator is short-term indicator and it gives buy/ sell signal by taking into account short-term price changes.³³⁰

6.5. Medium-Term Technical Indicators

Medium term technical indicators are indicators that are used for determining trends, which are started from one month up to a year. Basically their structures are similar to each other. Some of these are called as trend-following indicators due to used to determine to medium and long-term trends.

These indicators are not affected from small price movements such as short-term technical indicators due to prepared with long-term data. Therefore, their reliability is higher than the short-term indicators. However, these indicators can be late to catch the bottom and the peak points due to prepare the long term data. Return signal comes to a certain delay in medium-term indicators. Although this situation is seen negatively in terms of trading timing, it is a positive situation in terms of determining the direction of price and reliability. Medium-term technical indicators progress by displaying up and down oscillation on an axis. If the indicator is up to this axis, it refers to prices are medium and long term ascension trend and if the indicator is down to this axis, it represents that prices are downtrend.

Medium-term technical indicators are often used with the daily charts; they can also be used with the weekly and monthly charts. However, in case they are used with the weekly and monthly charts, analyzed period should be shortened to get successful results.³³¹

³³⁰ A. ÖZEKŞİ, *op.cit.*, p.238-245.

³³¹ Y.SARI, *op.cit.*, p.95.

6.5.1. MACD Indicator

MACD indicator that is one of the most stable indicators of technical analysis was firstly developed by Gerald Appel in 1979.³³² MACD word is shortening of the “Moving Average Convergence/Divergence”

MACD indicator is both reflects to the relationship between the moving averages and carries to principles of the some oscillators. With this aspect, MACD indicator is both trend follower indicator and it is an oscillator that help to determine to excessive buying and selling region. Another characteristic of the indicator is that it is used to detect inconsistencies. MACD with these characteristics is very common used by the technical analysts. Its reliability is higher when compared to other indicators and it is an indicator that used for determine to medium-term trend.³³³

MACD indicator is based on the moving averages. MACD indicator is obtained by comparing to two exponential moving averages. One of the most important features of MACD indicator is used to exponential moving average on its calculating. One of the moving averages is 12 daily and the second is 26 daily exponential moving averages. MACD indicator is obtained by subtracting from 12 daily exponential moving averages to 26 daily exponential moving averages.

MACD indicator formula is as follows:³³⁴

MACD= (12-Days Exponential Moving Average) – (26-Days Exponential Moving Average)

When two moving averages cross to each other, the indicator value is 0. In the case of indicator passes up to 0 value, MACD is positive, and in the case of indicator passes down to 0 value, MACD is negative. Thus, the MACD indicator is a

³³² A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Camm Sende! 3*, op.cit., p.100.

³³³ John J. MURPHY, *Görsel Analiz*, a.g.e., s.130.

³³⁴ Robert W. COLBY, *op.cit.*, p.412-413.

indicator that fluctuating around the 0 line. There is no upper value and lower value limits of the indicator.

From these explanations, when MACD indicator turned up to its direction by doing bottom, we should buy and when MACD indicator turned down to its direction by doing top, we should sell. However, in practice it is not possible to do this. Indicator can change its direction after a day. Gerald Appel has designed a curve to solve this problem. This curve is called as “trigger”.

This curve is used to buy/sell signal on the indicator. Trigger curve is calculated by taking to 9-day exponential moving average of calculated MACD curve. Fast- moving curve is MACD curve (line) and slow-moving curve is Trigger curve (signal curve). MACD curve is shown with the straight line and Trigger curve is generally seen with the dashed line. Intersected points of this curve are accepted as buy/sell signal. Indicator formula as follows:³³⁵

$$\text{MACD} = \text{EMA} (12) - \text{EMA} (26)$$

$$\text{Trigger} = 9\text{-Day Exponential Moving Average of MACD}$$

$K = 2 / (n+1)$ formula is used as exponential factor on the calculation of MACD indicator. “n” value in this formula represents to number of day.³³⁶ If both MACD curve and Trigger curve cut up to zero axis, it is evaluated as buy signal, and both MACD curve and Trigger curve cut down to zero axis, it is evaluated as sell signal.

Some analysts use MACD indicator by drawing in the form of histogram line. The difference between MACD and Trigger is drawn on the chart on histogram method. If the histogram is up to zero MACD is positive and if the histogram is

³³⁵ A. PERŞEMBE, **Teknik Analiz Mi Dedin? Hadi Canım Sende!** 3, op.cit., p.101-104.

³³⁶ İMKB. **Sermaye Piyasası ve Borsa Temel Bilgiler Kılavuzu**. 15th Edition. İstanbul:İMKB Yayınları, 2000, p.526.

down to zero MACD is negative. On the positive situation it is evaluated as buy signal and on the negative situation it is evaluated as sell signal.³³⁷

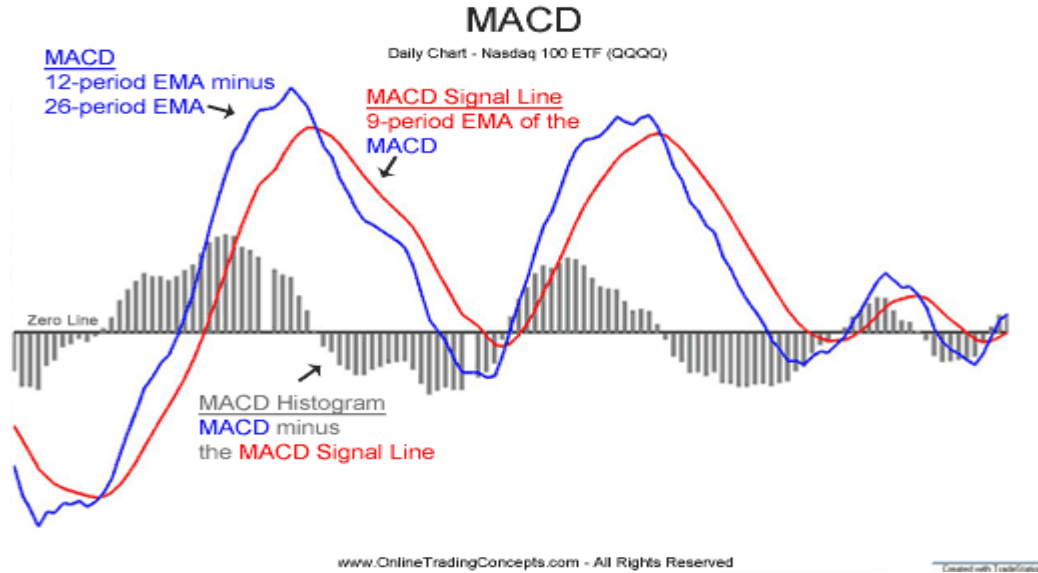


Figure LII MACD Indicator

Source: <http://www.onlinetradingconcepts.com/TechnicalAnalysis/MACD.html> (03.12.10)

MACD indicator can be used in four points by the technical analysts. Usage methods are listed below:³³⁸

- If slow-moving MACD curve cuts up to zero curve, it means buy signal and if the slow moving MACD curve cuts down to zero curve, it means sell signal.
- If MACD curve cuts up to Trigger curve, it represents to buy signal and if MACD curve cuts down to Trigger curve, it represents to sell signal.
- If MACD indicator makes bottom, it refers to buy signal and if the MACD indicator makes peak, it refers to sell signal. This method is applied by comparing to previous peak and bottom levels and experiences of technical analysts due to this method has not got to excessive buy and sell region.

³³⁷ John J. MURPHY, *Görsel Analiz*, op.cit., p.132-137.

³³⁸ A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Canım Sende!* 3, op.cit., p.107-108.

- The last usage is to predict the possible trend returns by detecting to incompatibilities between indicator and prices. When negative incompatibility is occurred on the indicator, it is evaluated as sell signal and when positive incompatibility is occurred on the indicator, it is evaluated as buy signal.

6.5.2. Price Oscillator

Price oscillator is an indicator that calculated by taking differences of moving averages of prices and it is shown a single curve on the chart programmes. Indicator is created a single curve by comparing the differences between short and long-term moving averages. This indicator is used for determining short and long term trend according to selected period.

In generally, the calculation of this indicator gives percentaged changing of short-term moving average to long-term moving average. Long-term average is occurred to zero axes. Curve that is on this axis is short-term moving average. The locations of two averages to each other determine to the direction of trend according to selected period. If indicator is below “0” axis, it means that short-term average is on the long-term average and if the indicator is up to “0” axis, it means that short-term average is below long-term average.

Indicator is calculated by two methods. First, to taking the difference between two average and second, indicator is taken as percentaged. The formulation of indicator as below:

Price Oscillator= STMA-LTMA

Price Oscillator Percentage Changing= $[(STMA - LTMA) / STMA] \times 100$

STMA: Short Term Moving Average

LTMA: Long Term Moving Average

Different periods can be used on the calculation of indicator. Generally; 1 day for short-term period and 25 days for long-term period is used on the chart programmes. Usually, 1/3 rate is used for rate between two averages. For example if short-term period is 14 days, the long term period can be use 42 days.³³⁹

The interpretation of the indicator is simple. If the indicator cuts top to bottom to “0” reference line, it is evaluated as prices are fallen according to selected period and if the indicator cuts bottom to up to “0” reference line; it is interpreted as prices are increased.

Another method for the interpretation of the indicator is to decide to buy/sell according to bottom and peak points that is created on the past by indicator. This method is usually used by investors who invest in medium-term. For buying signal bottom level or levels that is done in past by indicator is waited and if indicator closes and turns up to this level or levels it is evaluated as buy signal. For selling signal peak level or levels that is done in past by indicator is waited and if indicator closes and returns it is evaluated as sell signal.³⁴⁰

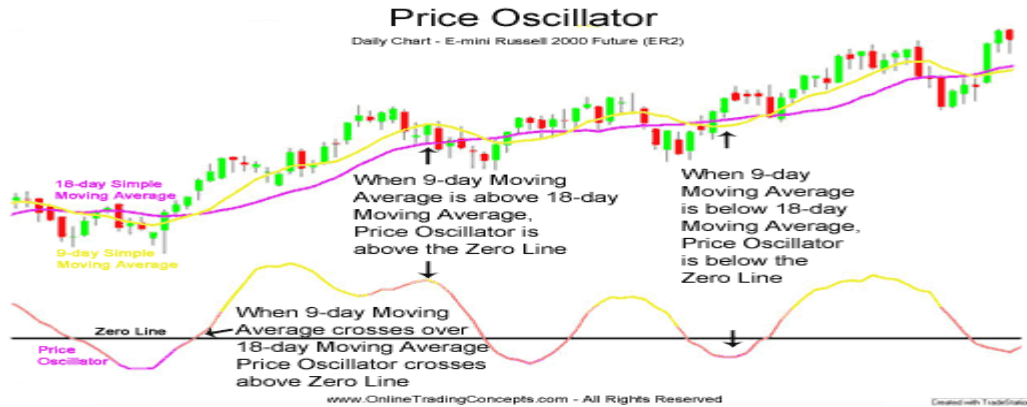


Figure LIII Price Oscillator

Source: <http://www.onlinetradingconcepts.com/TechnicalAnalysis/PriceOscillator.html> (03.12.10)

³³⁹ Y.SARI, *op.cit.*, p.95-97.

³⁴⁰ Y. ERDİNÇ, *Borsada Analiz (Yatırıma Psikolojik Hazırlık, Yöntem Seçimi, Strateji ve Başarı)*. 1st Edition Ankara: Siyasal Kitapevi, 1998, p.200.

6.5.3. Parabolic SAR Indicator

This indicator that is known as parabolic time/price system was developed by J. Welles Wilder. In shortly it is known as parabolic SAR. SAR is the shortening of “stop and reversal” words. This means that closing of current getting position and again gets position aback. Parabolic word comes from view that price chart is similar to parabola. This indicator is shown in the form of points on the price chart. This indicator was first planned as a trading system and according to this design; indicator is based on continuously position transportation principle.³⁴¹

This indicator was developed for markets that were short selling. Indicator is based on to detecting stop loss levels that are determined on prices for taking stock and float share. Indicator is used for verification to current trend and approve to signals of other indicators on the markets that were not short selling.³⁴²

Parabolic SAR is calculated on the day’s lowest and highest price values. Wilder benefited from day’s the lowest and highest values with acceleration factor. Wilder has said that the most appropriate value is 0.02 for acceleration factor. Indicator is calculated different for buying and selling positions.

The interpretation of this indicator is simple. The stop level is shown in the form of points on the price charts. The terms that points are below to price charts represent to ascension market and the terms that points are up to price charts represent to recession market. The important thing on the indicator is to find points that intersect of stop loss points to price chart.³⁴³

³⁴¹ A. PERŞEMBE, **Teknik Analiz Mi Dedin? Hadi Camm Sende!** 3, op.cit., p.116-117.

³⁴² Ö. KILIÇAY, **op.cit.**, p.183.

³⁴³ Y. ERDİNÇ, **Yatırımcı ve Teknik Analiz Sorgulanıyor**, op.cit., p.564-565.



Figure LIV Parabolic SAR

Source:

<http://www.onlinetradingconcepts.com/TechnicalAnalysis/ParabolicSAR.html>

(03.12.10)

6.5.4. Directional Movement Indicator (DMI)

This indicator that was developed J. Welles Wilder is an indicator, which aims to give information about to direction of movement and strength of the market index. This indicator is used for determining the trend and filtered wrong signals that are given by indicators.³⁴⁴ DMI indicator is an indicator that is able to show clearly to which stage of trend, direction of trend and the strength of trend. DMI indicator includes many derivative indicators such as DX, ADX, ADXR, +DI, -DI and DIS. These indicators get on the DMI calculation stage and they are used for different aims. These indicators are used with to each other or other indicators.³⁴⁵

DMI indicator is an indicator that has the characteristic of trend follower and trend determiner. Indicator can take positive or negative values. Positive indicator is shown as +DM and negative indicator is shown as -DM on the chart programmes. Wilder recommends to 14-day period on the calculation of this indicator and

³⁴⁴ Robert W. COLBY, *op.cit.*, p.212.

³⁴⁵ A. ÖZEKŞİ, *op.cit.*, p.309.

however different periods can be determined for each stock. The day's lowest, highest and closing value is benefitted from the calculation of indicator. +DM and –DM are shown on the same plane. If +DM increases, the direction of price movements is upward and if +DM decreases, -DM increase and the direction of price movements downward.

+DI (Directional indicator plus) and -DI are three of the two most using sub-indicators of the DMI indicator on the chart programmes. +DI and –DI is usually shown on the same plane. These indicators show stock or market under the influence of which direction of movement and they move against to each other. +DI shows increasement of stock or market's upward trend. –DI shows increasement of the stock or market's downward trend.³⁴⁶

DX (Directional Movement Index) moves between 0 and 100 values. Indicator just gives information about the speed of movement. DX rarely uses because it is too fast. Instead of this, ADX (Average Directional Movement) indicator is used.

ADX indicator is usually calculated by taking 14-day moving average of DX indicator.³⁴⁷ ADX indicator shows speed and strength of the movement direction of the stock or market. ADX moves between 0 and 100 values. This indicator is used for determine to which indicator should be used and it is not used single for buying and selling. This indicator just measures to strength of the price movements.³⁴⁸

The functions of DMI indicators can be summarized as follows:

- +DI and –DI is detected on the periods that were not any trend, any strength and the direction of trend. If +DI indicator cuts up to –DI indicator, it is evaluated as buying signal and if it cuts down to –DI indicator, it is evaluated as selling signal.

³⁴⁶ A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Canım Sende! 3*, op.cit., p.160-164.

³⁴⁷ A. MERGEN, *Kurtlarla Tango (Süper Teknik Analiz)*. 1st Edition Istanbul:Mergen Yayınları, 1993, p.364-366.

³⁴⁸ John J. MURPHY, *Görsel Analiz*, op.cit., p.143.

- If ADX is below than 20 levels, it means that market isn't any trend. If ADX is up to 20 levels, it is evaluated as the beginning of new and strong trend.
- When the ADX is up to 20 levels, the trend follower indicators are used and when the ADX is below to 20 levels, short-term excessive buy/sell regions are used.³⁴⁹

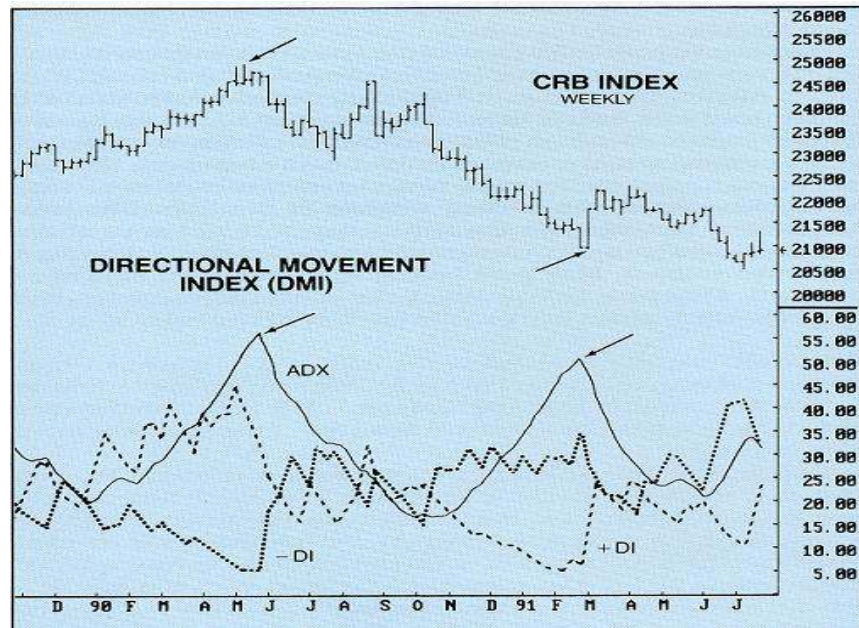


Figure LV Directional Movement Index

Source: <http://club.ino.com/trading/2008/09/traders-toolbox-how-to-use-the-directional-movement-index/> (03.12.10)

6.6. Indicators that are used on the Trading Volume Analysis

Trading volume is an analysis tool that gives information about whether stock or market will continue on the direction of movement. High trading volume represents to current price movement will go on and low trading volume refers to current price movement will be end. For that reason; trading volume must be supported to direction of trend and the direction of trend movements should be

³⁴⁹ A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Canım Sende!* 3, op.cit., p.178.

increased or not fallen. The other situations are evaluated as a harbinger of a trend change in technical analysis.³⁵⁰

6.6.1. On Balance Volume (OBV)

OBV was developed by Joseph Granville and it was firstly explained in his book that is named “New Key to Stock Market Profits” in 1963.³⁵¹ Indicator is based on comparing with trading volume and price movements. OBV indicator is the most frequently used indicator in trading volume analysis. Indicator is used to determine whether cash inflows on the stock. If OBV indicator increase, it means that there are cash inflows and if the OBV indicator is declined, it means that there are cash outflow.

OBV indicator usually displays parallel movements with the price charts. Changing on the OBV indicator is emerged before price charts. It means that; if the indicator increases prices will increase and if the indicator decreases, prices will decrease.³⁵² The theory in here is; when knowing investors begin to take the stock, OBV increases and with the starting to increasement of OBV, small investors begin to enter into the market. At this stage, OBV even more increases and after this prices move higher.

Point to take into account on the usage of the indicator is inconsistency that is occurred between prices and indicator at the bottom and peak points of the short and medium term trends. Inconsistencies are evaluated as premise sign of trend changes.³⁵³

The other method is that it is used for the interpretation of indicator to predetermining of trend changing signal by drawing to trend lines. Broken of upward

³⁵⁰ A. ÖZEKŞİ, *op.cit.*, p.345.

³⁵¹ John J. MURPHY, *Görsel Analiz*, *op.cit.*, p.63.

³⁵² Martin.J. PRING, *op.cit.*, p.431.

³⁵³ Y. ERDİNÇ, *Borsada Analiz(Yatırıma Psikolojik Hazırlık, Yöntem Seçimi, Strateji ve Başarı.* *op.cit.*, p.165-166.

trend that is drawn on the indicator is evaluated as sell signal and broken of downward trend that is drawn on the indicator evaluated as buy signal.³⁵⁴

For using this indicator in the form of reliability, trading volume should be comparable with the past. This indicator is used for verification of trends. Finally, if the OBV indicator falls immediately, this situation show that sellers are strong and if the OBV indicator increases immediately, this situation shows to buyers are strong.



Figure LVI On Balance Volume

Source: <http://www.onlinetradingconcepts.com/TechnicalAnalysis/OnBalanceVolume.html>
(03.12.10)

6.6.2. Money Flow Index (MFI)

This indicator was developed by Chaikin. It is an indicator that is aimed to measure strength of money inflows and outflows by assuming on the upward days

³⁵⁴ A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Canım Sende!* 3, op.cit., p.184.

money inflows are occurred and on the downward days money outflows are occurred.

The calculation of MFI indicator is quite easy. Its calculation looks like RSI indicator. Difference between them only trading volume is added while MFI is calculated. Firstly period is determined. This period is usually 14-day. MFI formulation is as below:³⁵⁵

$$MFI = 100 - [100 / (1 + \text{Money Ratio})]$$

$$\text{Money Ratio} = \text{Positive Money Flow} / \text{Negative Money Flow (on specified period)}$$

$$\text{Money Flow} = \text{Typical Price} \times \text{Trading Volume}$$

$$\text{Typical Price} = (\text{The Lowest} + \text{The Highest} + \text{Closing Price}) / 3$$

Values except of money flow are fixed and they take between 0 and 100 values. 20 and 80 levels are accepted as reference values. If indicator is up to 80 levels, it refers to excessive buying and if indicator comes down to 20 levels, it refers to excessive selling. If indicator turns up while it down to 20 levels, it is evaluated as buy signal. If indicator passes to 80 levels, it is evaluated as sell signal.

³⁵⁵ A. ÖZEKŞİ, *op.cit.*, p.353-359.



Figure LVII Money Flow Index

Source: <http://www.onlinetradingconcepts.com/TechnicalAnalysis/MoneyFlowIndex.html> (03.12.10)

PART VII

EMPRICAL ANALYSIS

7.1. Purpose of the Study

The main idea of the technical analysis is based on that stock prices are moved with to trends. Contrary to efficient market hypothesis; when the new information is released on the market, this information is not learned by everyone at the same time. The new information reaches first of to all market professionals and aggressive investors then it reaches to majority of the investors. The analysis, interpretation and correct react of this new knowledge by investors don't occur immediately, it takes place gradually over time. In addition, it is not possible that all investors know and apply fundamental, technical and other type of analysis. Even assuming that investors know all analysis, it is difficult to make same comment during same period of time. Finally, there may be excessive or inadequate reaction. All these are typical examples of deviation from market efficiency.

Investors could learn market moves how and to which direction and market gives which signal in the direction of buying or selling with the help of technical analysis applications.

Technical analysis indicators have an important role in terms of determination of buying and selling times and when doing to price analysis of stocks, foreign exchange, commodities and future contracts.

The main purpose of the study is to investigate whether higher return has been obtained as compared to simple "buy and hold" strategy by using to Bollinger Bands to determine stock selling and buying times. Therefore, tests were done retrospectively by using stocks' historical data

7.2. Hypothesis of the Study

According to efficient market theory; in weak efficient markets future price movements cannot be predicted by using past price movements.

In such a market, it is not possible to obtain above the average return on the market by using any mechanical trading rules. Therefore, in accordance with the purpose of the study, the hypothesis of the study is to purchase and sale transactions that would done with the Bollinger Bands' signal will be more successful than purchase and sale transactions that would done simple buy and hold strategy.

H_0 = Return that above simple “buy and hold strategy” can not be obtained by using a mechanical trading rule.

H_1 = Return that above simple “buy and hold strategy” can be obtained by using a mechanical trading rule.

7.3. Sampling

Stocks that are selected in this study include ISE 30 indexes. These are: Akbank, Ak Enerji, Arçelik, Doğan Holding, Doğan Yayın Holding, Eczacıbaşı İlaç, Enka İnşaat, Ereğli Demir Çelik, Garanti, İş Bankası (C), Koç Holding, Koza Anadolu Metal Madencilik İşletmeleri AŞ., Kardemir (D), Petkim, Sabancı Holding, Şişecam, Şekerbank, Turkcell, TEB, Türk Hava Yolları A.O., Tüpraş, Vestel and Yapı Kredi Bankası. Totally 23 stocks have been used. Others (Asya Bank, Halk Bankası, Koza Altın İşletmeleri A.Ş., TAV Havalimanları Holding A.Ş., Tekfen Holding A.Ş., Vakıfbank and Türk Telekom) are extracted because their data doesn't suitable for this study (their trade begun after 2005). Stocks were measured between 03.01. 2005. and 29.11.2010. The study period begins from 2005 because; listed companies have started to use international financial reporting standards in this year. Appraisal time includes 5 – year time period.

Company names and stock codes are given below:

Table 1 Stock Codes and Company Names

CODE	COMPANY NAME
AKBANK	AKBANK
AKENR	AK ENERJİ
ARCLK	ARÇELİK
DOHOL	DOĞAN HOLDİNG
DYHOL	DOĞAN YAYIN HOLDİNG
ECILC	ECZACIBAŞI İLAÇ
ENKAI	ENKA İNŞAAT
EREGL	EREĞLİ DEMİR ÇELİK
GARAN	GARANTİ BANKASI
ISCTR	İŞ BANKASI (C)
KCHOL	KOÇ HOLDİNG
KOZAA	KOZA ANADOLU METAL MAD. İŞL. A.Ş.
KRDMD	KARDEMİR (D)
PETKM	PETKİM
SAHOL	SABANCI HOLDİNG
SISE	ŞİŞECAM
SKBNK	ŞEKERBANK
TCELL	TURKCELL
TEBNK	TÜRK EKONOMİ BANKASI
THYAO	TÜRK HAVA YOLLARI A.O.
TUPRS	TÜPRAŞ
VESTL	VESTEL
YKBNK	YAPI KREDİ BANKASI

7.4. Research Method and Assumptions

The used data are daily highest, lowest and closing prices that are published by ISE on the Daily Bulletin each day by day. Excel and AnalizciTrader programmes were used for the calculation.

The method of research was conducted in two phases. Firstly; short holding periods are focused. Ad hoc; 1-year holding periods are applied to every-year since 2005(2005-2006, 2006-2007 etc.). After this, stocks were evaluated according to Bollinger Bands.

The common characteristics of each test are listed as follows:

- 1000 TL is invested initially to each stock.
- It is assumed that any process commission is not paid on the each purchase and sale process. This ratio is the lowest rate that is determined by Capital Markets Board. This sub-ratio has been removed since 2006.
- It is assumed that, the purchase is made in the amount of available capital to every purchase signal.
- It is assumed that when the system gave buy signal, purchase is done on the same day's closing price and when the system gave sell signal, sell is done on the same day's closing price.
- There isn't any tax computation for obtained capital gains and dividend during test period.

7.4.1. Test within the Scope of the Research

Buy and sell rules are based on the Bollinger Bands on the scope of the research. Then findings were compared to simple "Buy and Hold" strategy. After this comparison, study was tried to find whether the rate of return of Bollinger Bands is better than buy and hold strategy or not.

7.4.1.1. Bollinger Bands

Usage and interpretation of Bollinger band is easy. Bollinger bands are used in two ways by traders. The bottom line of band is considered as support point for prices and when prices reach to this point, it is evaluated as purchase opportunity. Upper line of band is considered as resistance point and when prices reach this point, it is evaluated as sales opportunity. In the second method it is expected that prices break bands from the bottom and up. The logic in here, a big trend will begin to the price break with band in a direction. It is assumed that prices are in what direction the Bollinger bands broken, the prices movement continues in that direction and prices are in which direction the bands broken, position is taken in that direction.³⁵⁶

Interpretation of Bollinger bands can be summarized briefly as follow:³⁵⁷

- Gradual and sudden increase of Bollinger bands is a signal of important price changes. This is very important and characteristic of Bollinger bands should be considered.
- Going out of prices from the Bollinger band is a signal that prices will go on to the direction at the Bollinger bands' broken point and this is evaluated as buy signal.
- During the ascension trend, to back into the band after the prices are at peak by moving out of the band and when the second peak practices into Bollinger band, it is interpreted that a signal of trend entered into a falling tendency and this is evaluated as sell signal.

³⁵⁶ A. PERŞEMBE, *Teknik Analiz Mi Dedin? Hadi Canım Sende!* 3, *op.cit.*, p.37-38.

³⁵⁷ M.ŞAHİN, *op.cit.*, p.135-136.

Table 2 Obtained Percentage of Rate of Return with the Use of Bollinger Bands and Buy and Hold Strategy

	2005		2006		2007		2008		2009		2010	
STOCK	BB	BH	BB	BH	BB	BH	BB	BH		BH	BB	BH
	%	%	%	%	%	%	%	%		%	%	%
AKBNK	88,52	62,70	18,46	-0,86	58,58	30,50	67,70	-41,36	172,58	99,42	69,04	15,71
AKENR	15,74	-1,53	58,62	-29,68	210,52	145,55	34,97	-41,55	177,47	135,65	26,18	18,54
ARCLK	46,11	24,01	19,28	-7,01	34,78	1,97	7,92	-73,26	394,26	273,20	58,44	33,45
DOHOL	49,36	54,66	39,51	6,89	48,69	0	39,43	-53,65	238,46	80,70	9,61	9,70
DYHOL	89,45	68,40	55,65	-6,84	34,31	-2,84	67,25	-86,02	241,30	126,31	21,89	31,78
ECILC	75,94	82,35	96,20	25	40,42	-4,51	21,90	-47,33	290,14	206,32	26,57	-3,96
ENKAI	34,78	36,40	53,80	80,54	70,12	104,51	27,73	-65,68	55,39	95,78	36,49	-1,43
EREGL	76,62	70	7,62	3,52	55,05	99,62	96,24	-43,83	126,51	50,50	34,83	12,50
GARAN	73,24	100,74	45,07	-3,24	66,53	125,74	51,52	-57,59	218,55	143,41	69,39	30,89
ISCTR	75,55	92,27	44,23	-21,20	52,69	15,86	59,72	-41,37	126,98	72,61	69,64	40,86
KCHOL	50,93	4,71	32,34	-4,82	46,60	52,02	15,50	-52,24	141,81	100,93	71,42	66,04
KOZAA	284,37	356	255	144,82	139,57	74,66	24,52	-82,97	481,60	441,57	27,42	-12,19
KRDMD	34,61	-7,89	35,29	-5,71	200	160	29,50	-63,95	110	106,45	31,57	6,25
PETKM	56,73	20,14	20,61	-35	127,27	69,23	29,45	-45,71	102,53	56,84	52,20	55,70
SAHOL	84,64	49,32	58,99	10,11	55,33	18,16	69,69	-44,07	166,36	77,42	39,08	36,54
SISE	61,40	28,77	58,15	6,14	32,58	9,47	22,53	-53,62	94,50	87,5	71,76	41,98
SKBNK	70,31	154,54	67,2	-4,46	193,13	187,85	34,67	-78,14	194,02	153,73	33,33	0,58
TCELL	43,55	10,91	29,38	7,33	105,61	85,50	19,81	-28,89	47,66	28,22	42,94	5,13
TEBNK	205,88	175,94	57,74	6,42	61,50	15,94	48,95	-71,74	273,21	242,10	40,22	-12,97
THYAO	51,72	6,92	12,5	-28,05	42,14	41	34,28	-32,85	478,16	430,85	67,11	9,41
TUPRS	90,36	104,66	31,28	4,89	32,85	53,73	37,40	-45,38	130,61	110,60	55,62	26,76
VESTL	8,95	-3,60	33,20	-26,59	41,60	-21,25	34,04	-67,68	190,80	198,85	16,94	-5,38
YKBNK	25,92	48,29	39,78	-1,83	97,98	67,75	30,09	-40,84	121,79	53,99	72,83	53,04

* **BB:** Bollinger Bands

* **BH:** "Buy and Hold" Strategy

- This study is done according to this approach's rules which are placed above. In briefly; if the prices are placed above the upper band, this situation is accepted as selling, on the other hand if the prices are placed under the middle band, this situation is accepted as buying signal.

TABLE 3 THE SUMMARY OF T TEST RESULTS	
STOCK	“Bollinger Bands” and “Buy and Hold” Strategy Comparison
AKBNK	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
AKENR	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
ARCLK	H ₀ is accepted so, there are not any differences between two strategy
DOHOL	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
DYHOL	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
ECILC	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
ENKAI	H ₀ is accepted so, there are not any differences between two strategy
EREGL	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
GARAN	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
ISCTR	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
KCHOL	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
KOZAA	H ₀ is accepted so, there are not any differences between two strategy
KRDMD	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
PETKM	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
SAHOL	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
SISE	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
SKBNK	H ₀ is accepted so, there are not any differences between two strategy
TCELL	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
TEBNK	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
THYAO	H ₀ is accepted so, there are not any differences between two strategy
TUPRS	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
VESTL	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy
YKBNK	H ₀ is rejected so, Bollinger band is more significant than Buy and Hold Strategy

7.5. Findings

Obtained percentage of rate of returns has been shown in Table 2. At totally 138 tests were used to obtain this table. It is seen that, rate of returns that obtained from Bollinger Bands has been found higher than the rate of returns that obtained from Buy and Hold Strategy at %88.40 of the tests.

In accordance with the findings of the T test, the H_0 is rejected for almost every stock and it can be said that; purchase and sale transactions that would be done with the Bollinger Bands' signal will be more successful than purchase and sale transactions that would be done with Buy and Hold Strategy between 2005 and 2010 periods.

PART VIII

CONCLUSION AND SUGGESTIONS

Today interest in investment vehicles has significantly increased. Investment world has made very significant increases on both product and investor, as well as the size of trading volume. The interest in classic investment tools reflect commodity markets that are done on the purpose of hedging and an ordinary investor starts to give into them his portfolio.

Despite great interest in the investment world, which vehicle, at which time, which price that investment is made, and price when and what is disposed of this investment questions are still the most difficult subjects to answer by investors.

On the other hand, financial media have increased the interest in investment vehicles with publications that are done by written and visual tools. These publications (news, data and information) sometimes were seriously increased to financial chaos and they mixed the problem of investors what to do on changing conditions.

Today, information has become easily available via internet. However, even though many investors have knowledge, investors still can not give the right decision on account of internal and external influences. Here, highlighted subject; investment failures still continue in full force, despite so much data, information, financial media, experts and development analytical models.

The most important reason for this situation is that, many analysis methods exclude to two important data. The first two of these factors are supply and demand that consists of the price, they have not been considered to analysis. Market is the only mechanism that decides what price action will be seen in an investment tool. The other important subject is related to investor psychology. Investor psychology is the most important impulse that stimulates to investors to buyers or sellers side. It is the most important factor in the success or failure of investments.

Technical analysis is the most important methodology that we can observe to psychological mechanisms and attach to them we can predict future. Because, the only knowledge of technical analysis is related to price that is the result of the supply and demand. For this reason; systematic technical analysis studies provide an accurate monitoring to these two main factors. On the other hand; Bollinger Bands concentrate on buyers and sellers decisions and psychological items under these decisions. The degree of importance of the concentration subject makes these analyses valuable.

Stocks that have been placed in ISE National- 30 Index have been used in this study. Stocks were measured between 03.01.2005 and 29.11.2010. Annual rates of return were found by taking the advantage of the Bollinger Bands. Found numbers were compared with Buy and Hold Strategy. As a result of doing analysis, study has concluded with that extraordinary returns in ISE can be obtained by using Bollinger Bands.

Finally, if markets are weak efficient; future price movements cannot be predicted by using past price data, and it is not possible to get above the average return on the market by using technical analysis. According to the results, the market is not weak efficient for the analyzed period.

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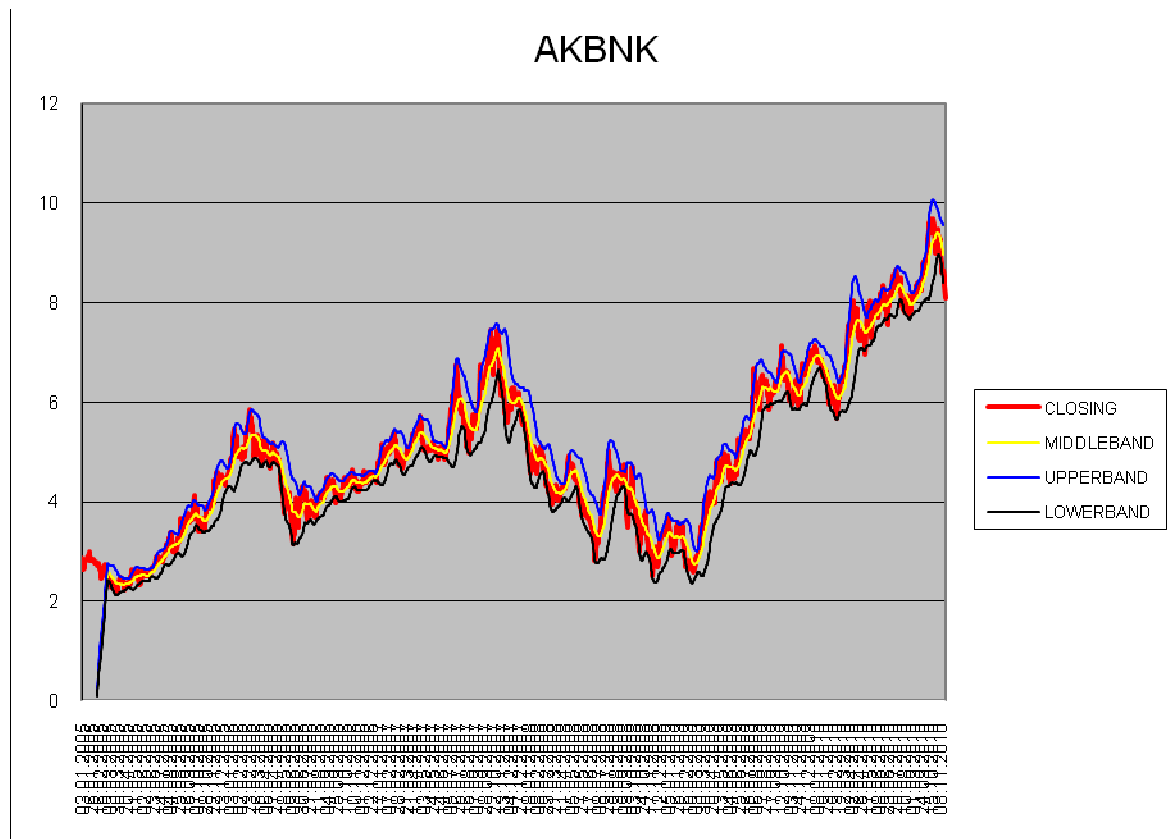
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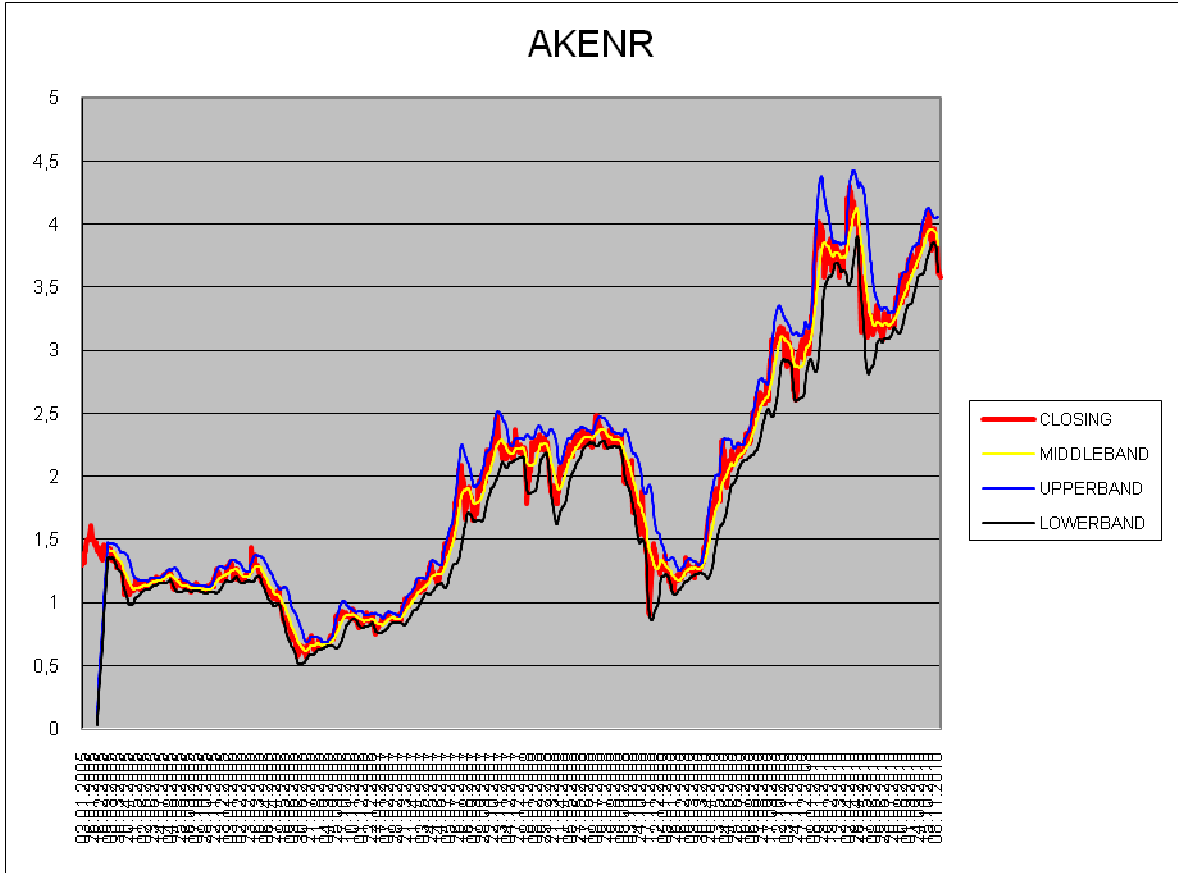
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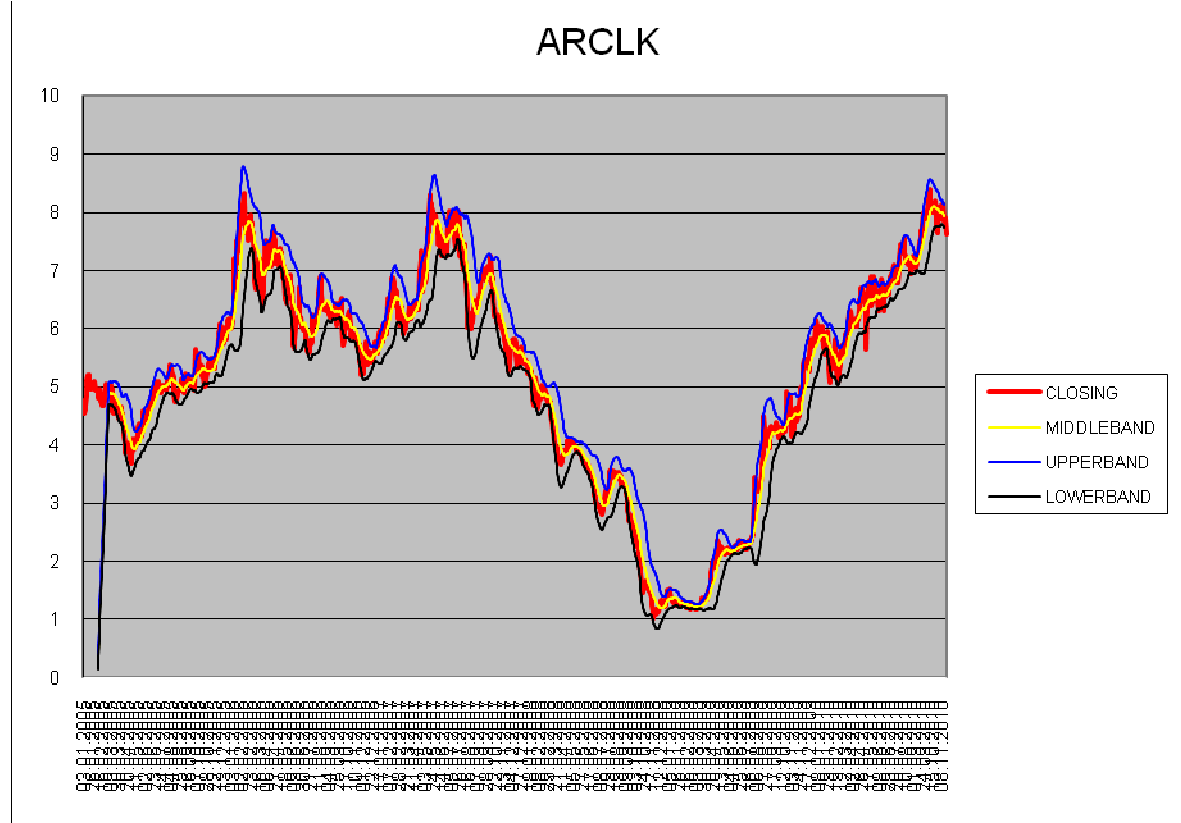
APPENDIXES

Appendix I AKBANK

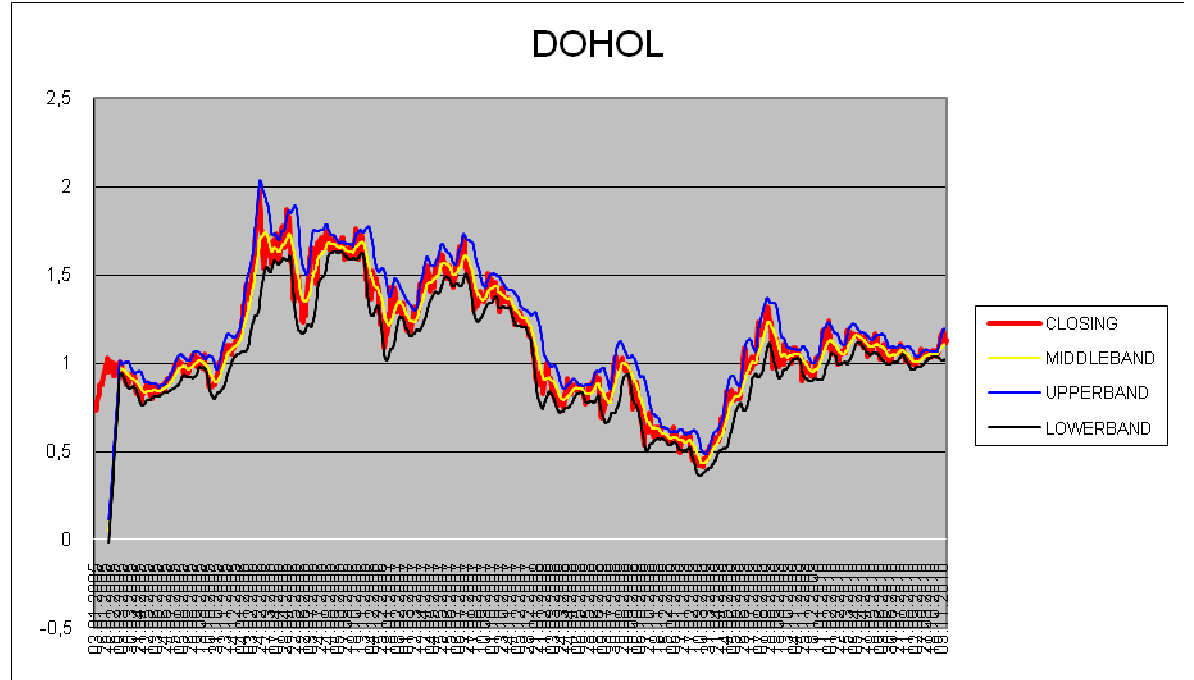




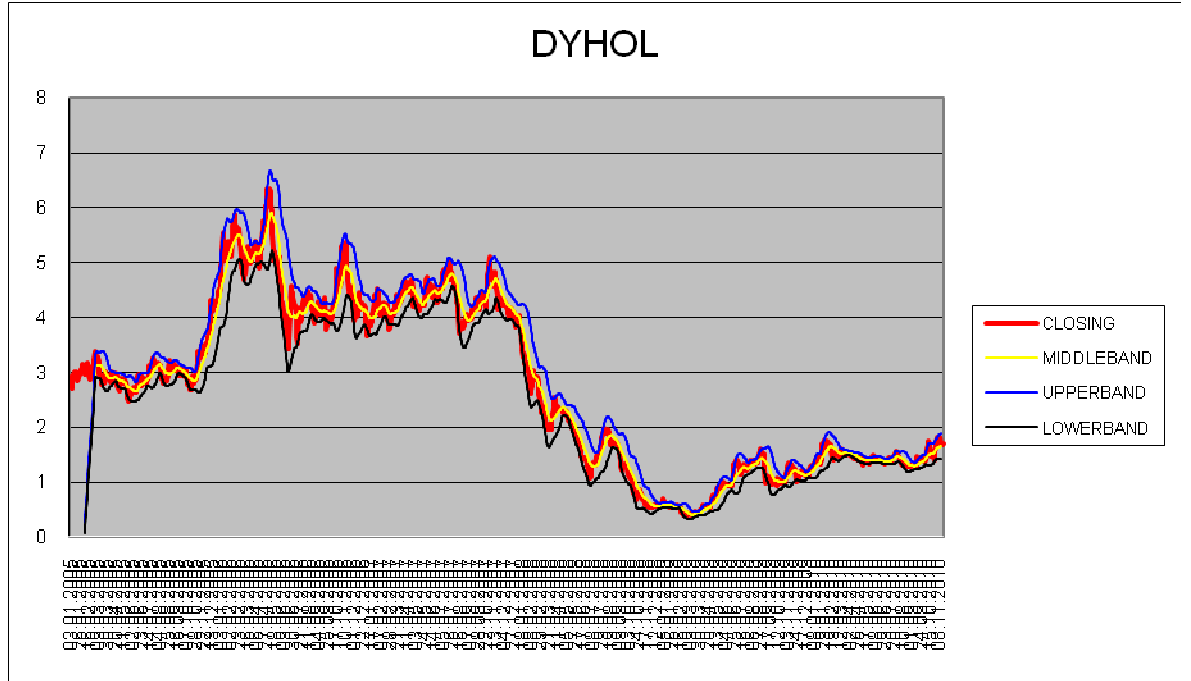
Appendix III Arçelik



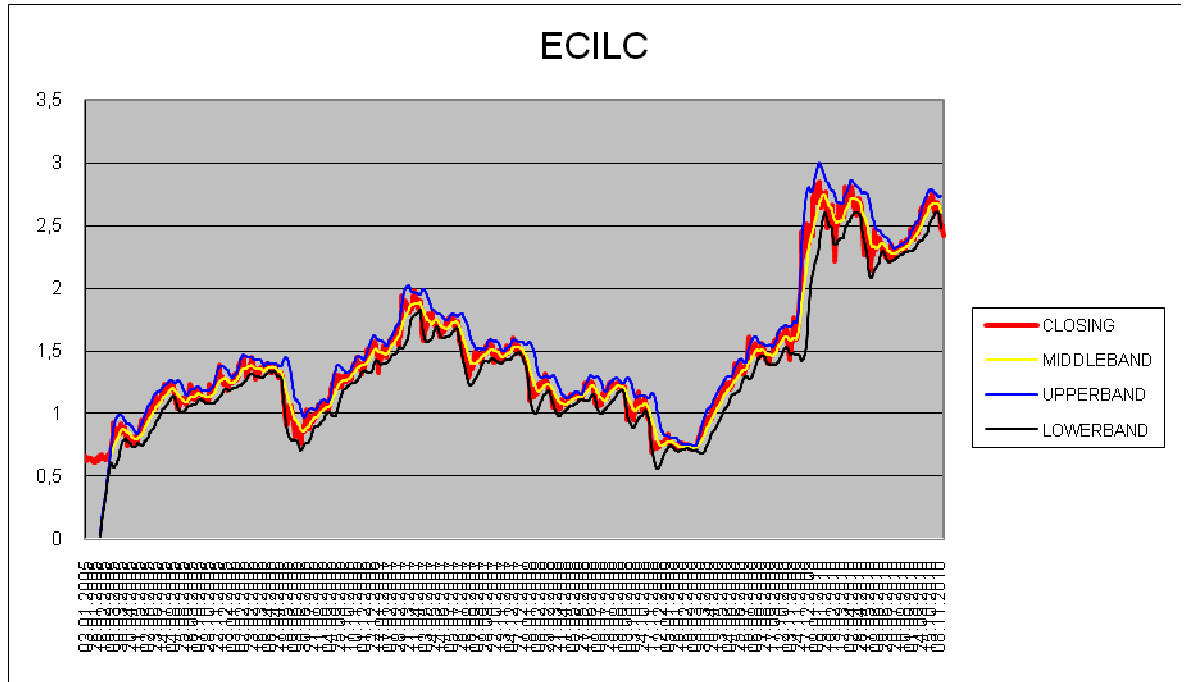
Appendix IV Doğan Holding



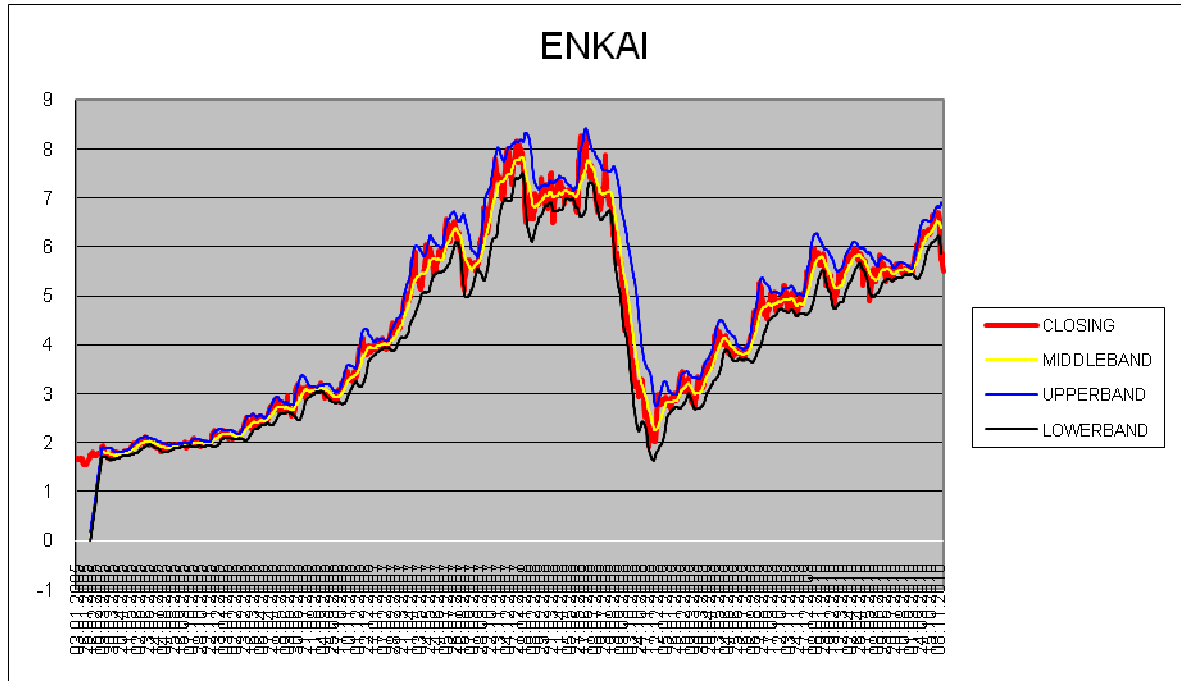
Appendix V Doğan Yayın Holding



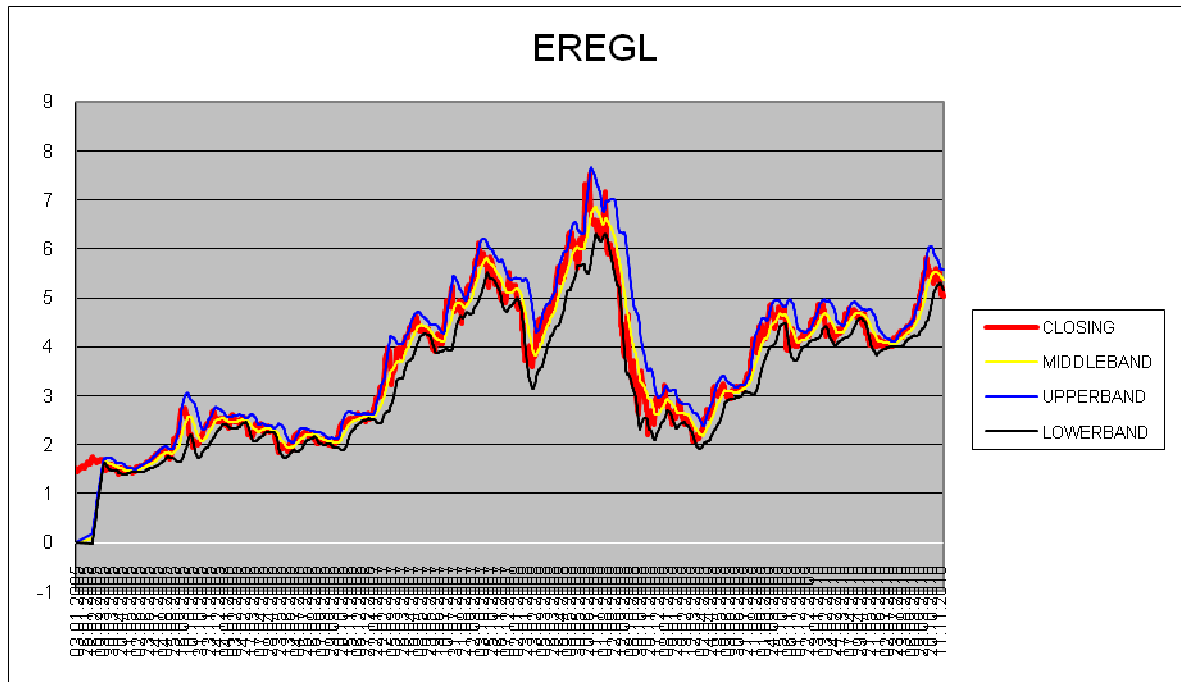
Appendix VI Eczacıbaşı İlaç



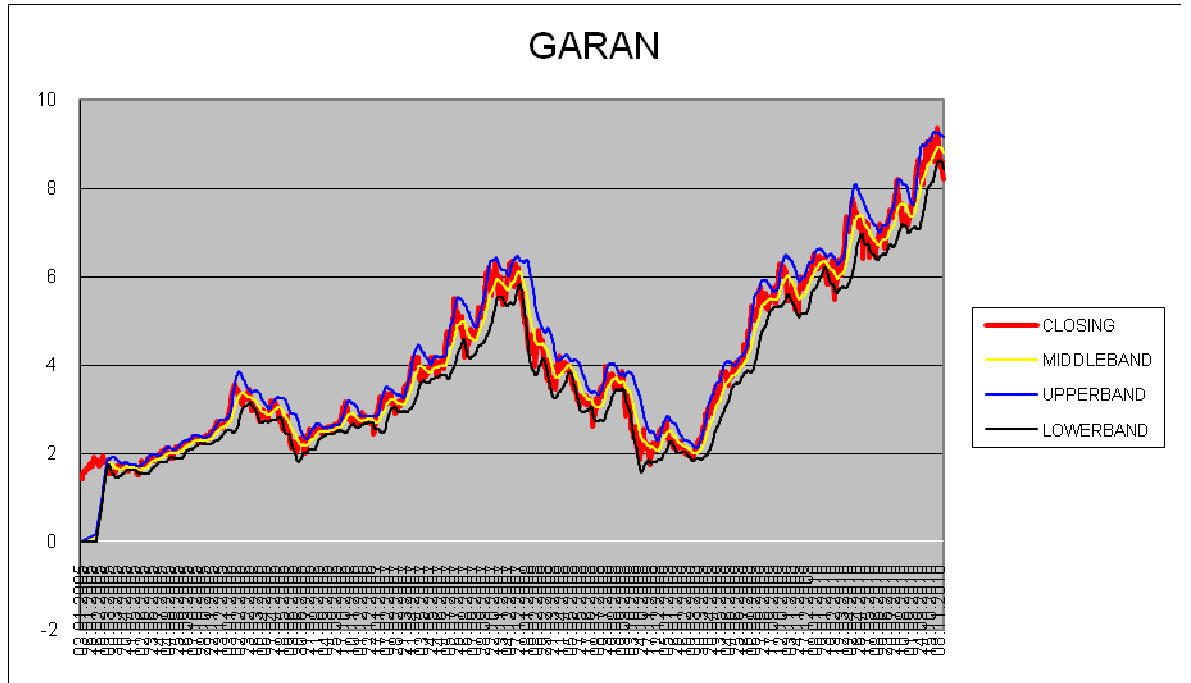
Appendix VII Enka İnşaat



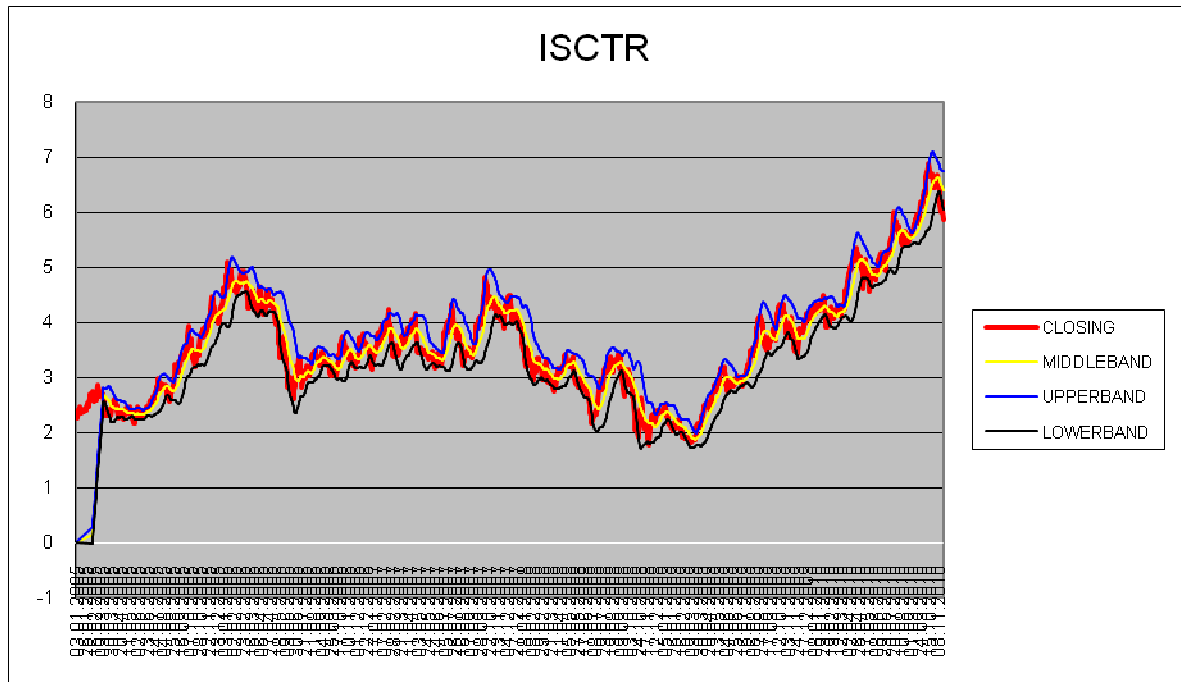
Appendix VIII Ereğli Demir-Çelik



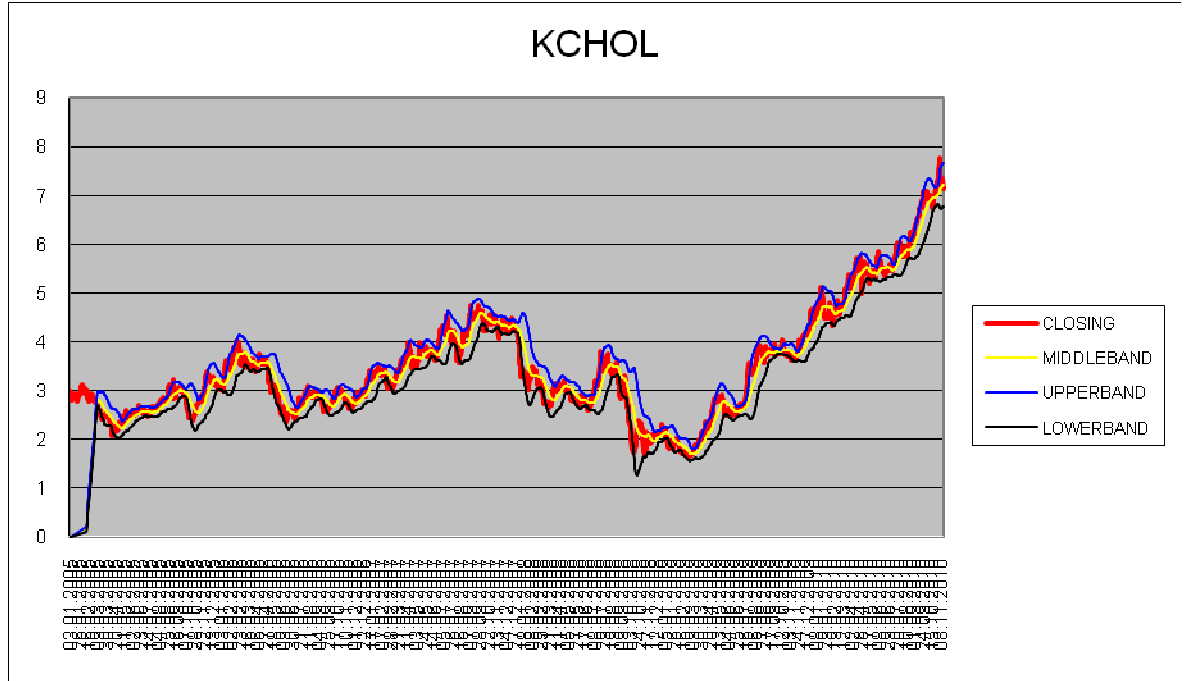
Appendix IX Garanti Bankası



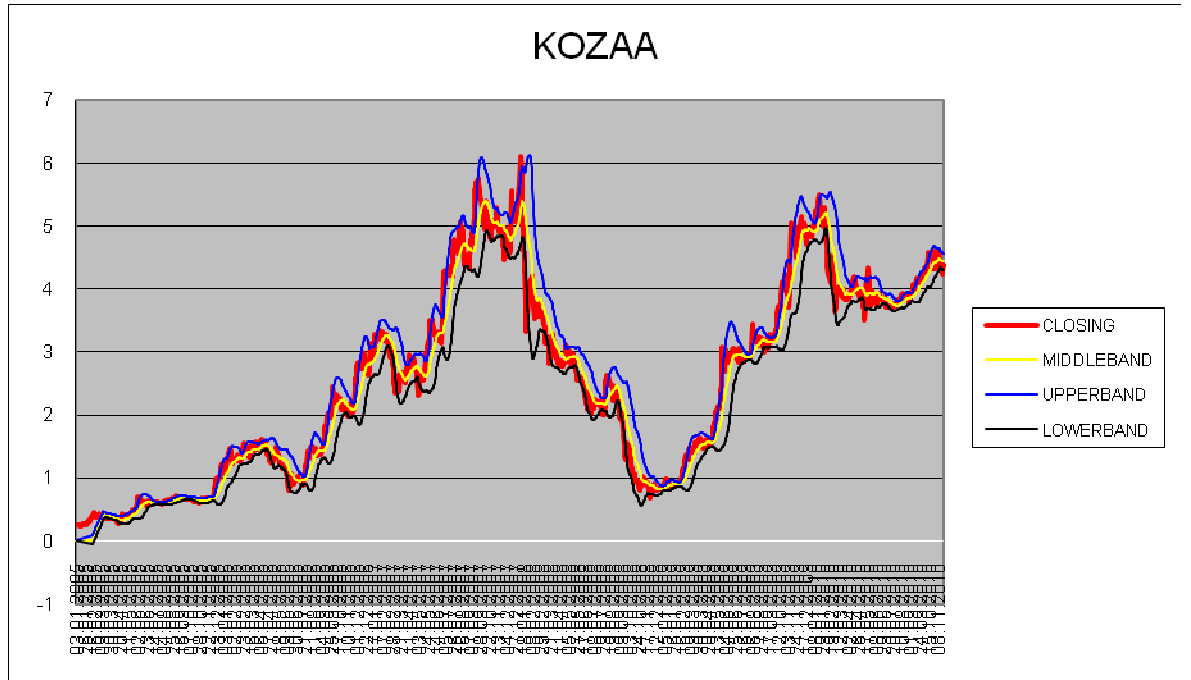
Appendix X İş Bankası (C)



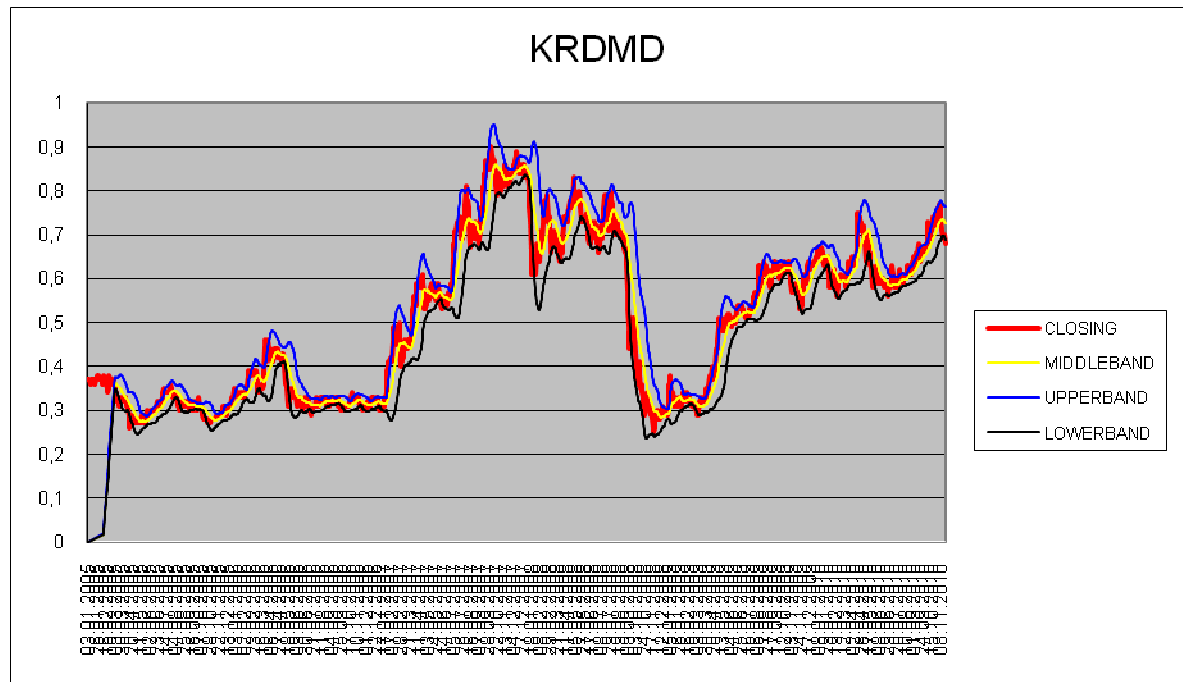
Appendix XI Koç Holding



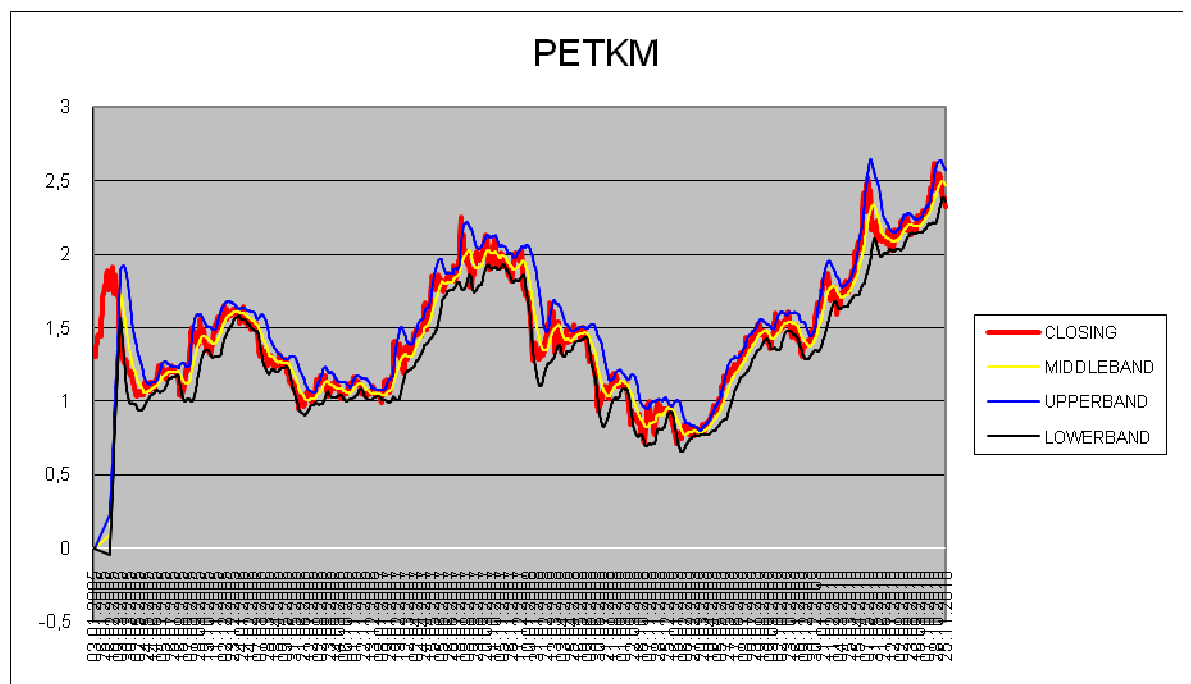
Appendix XII KOZA ANADOLU METAL MAD. İŞL. A.Ş.



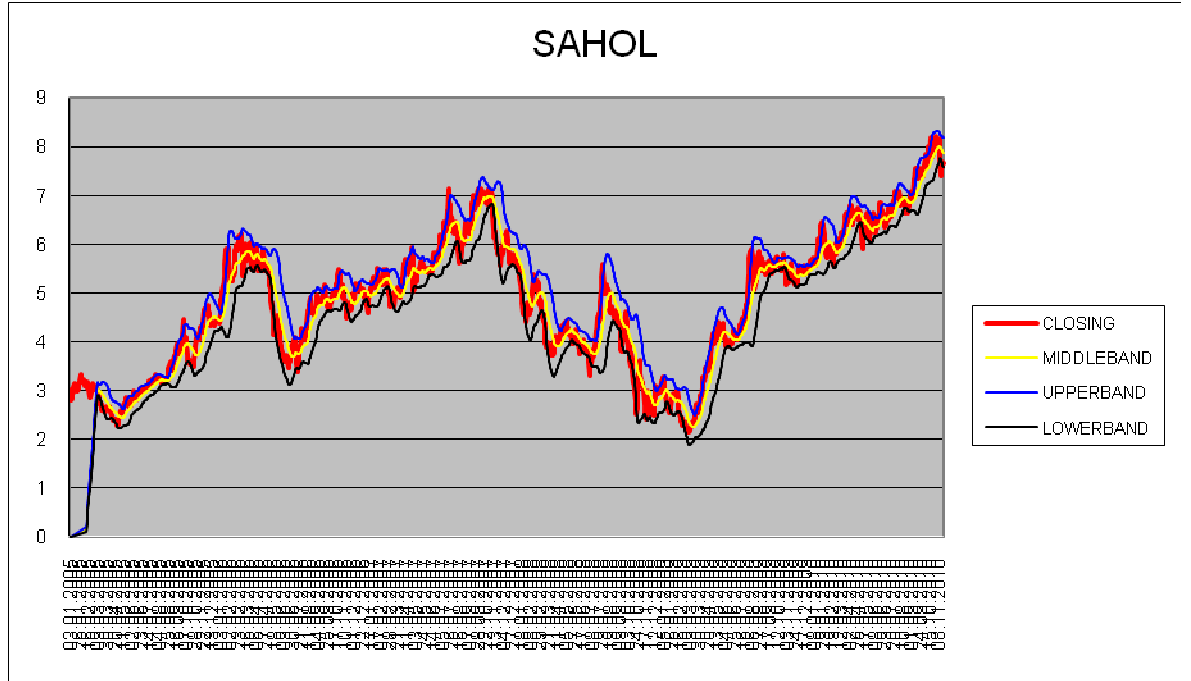
Appendix XIII Kardemir (D)



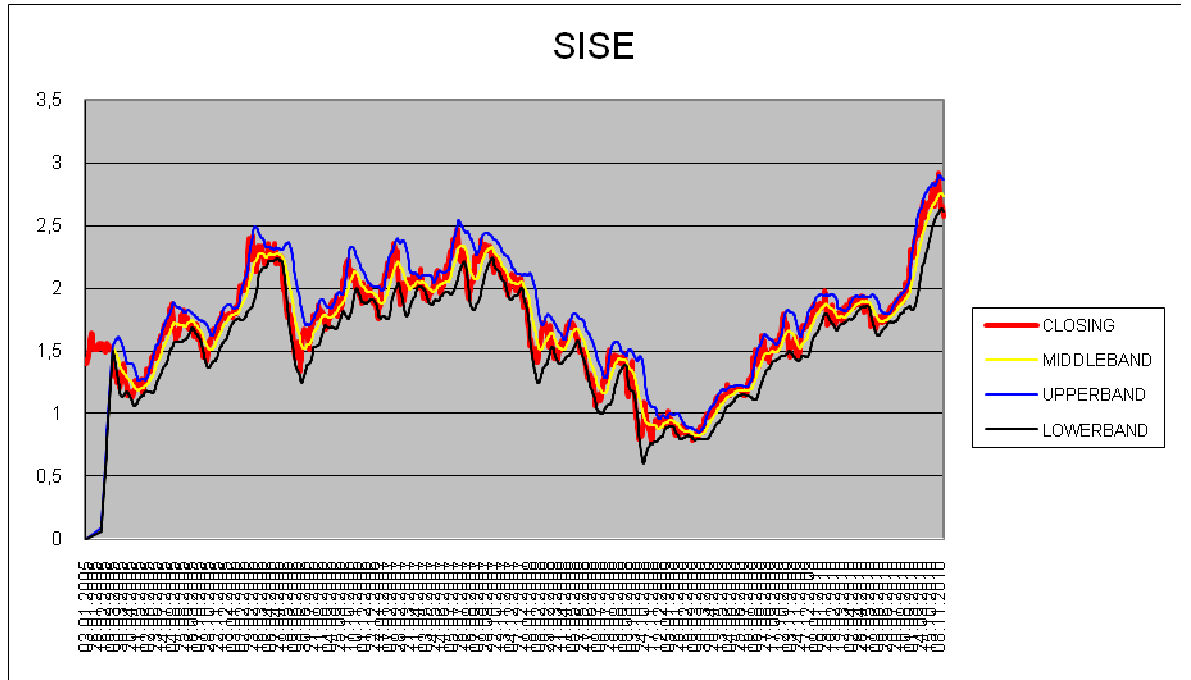
Appendix XIV PETKİM



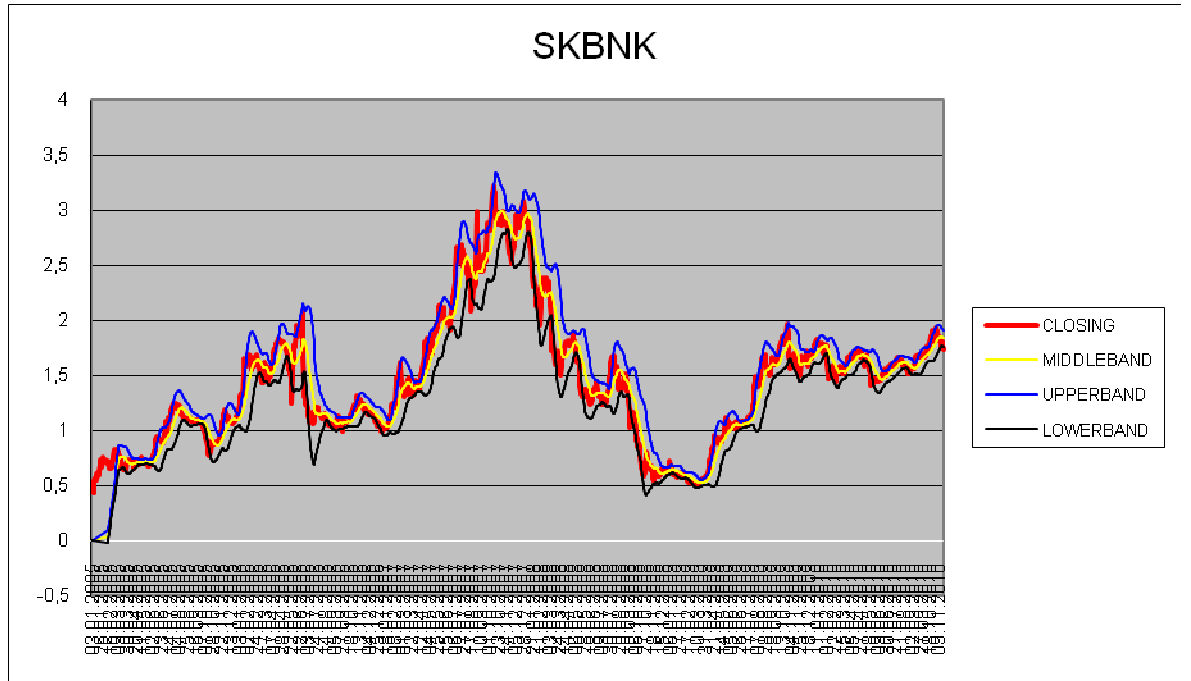
Appendix XV Sabancı Holding



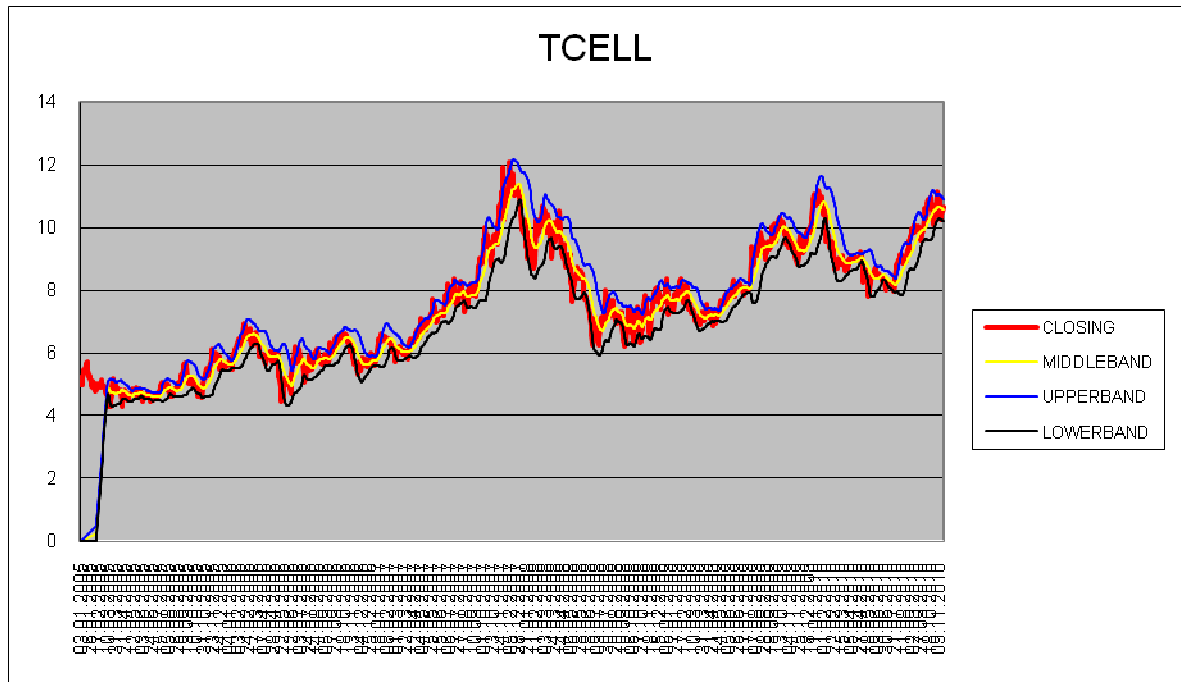
Appendix XVI ŞİŞECAM



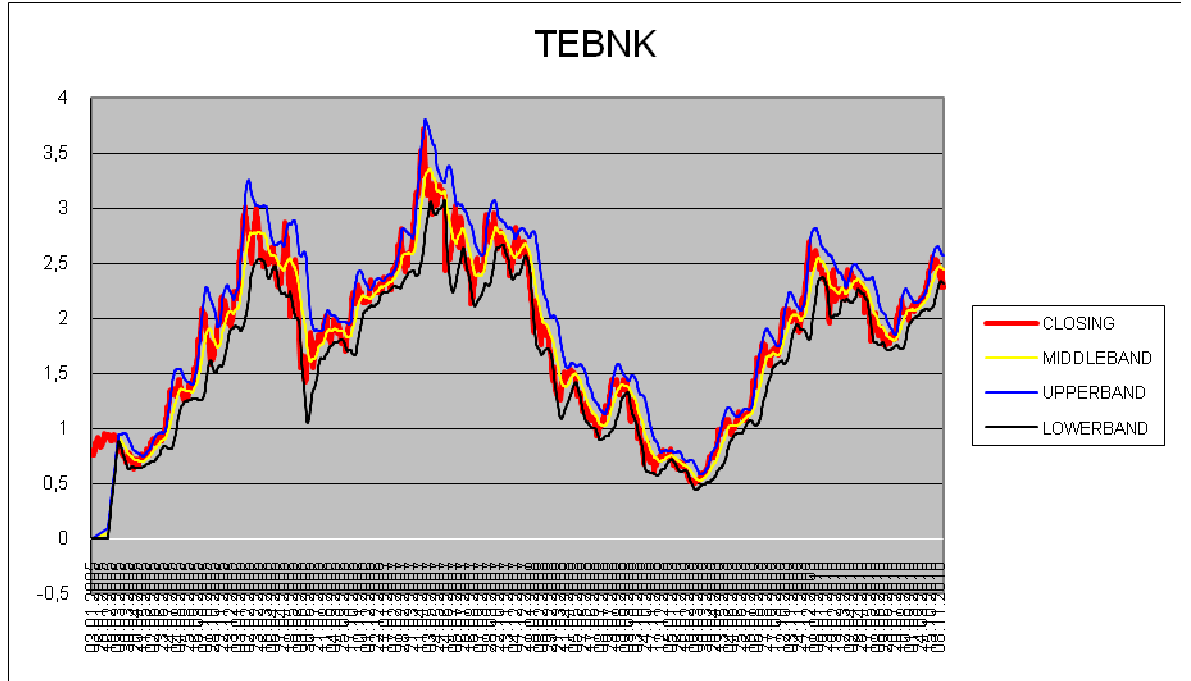
Appendix XVII Şekerbank



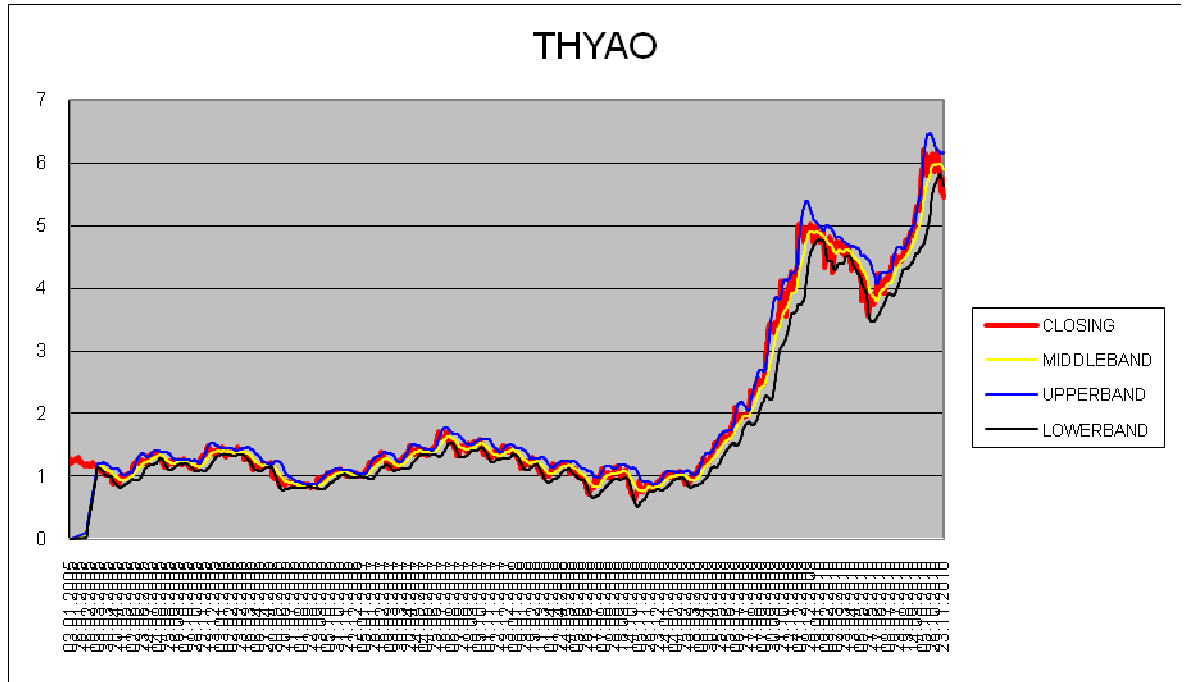
Appendix XVIII Turkcell



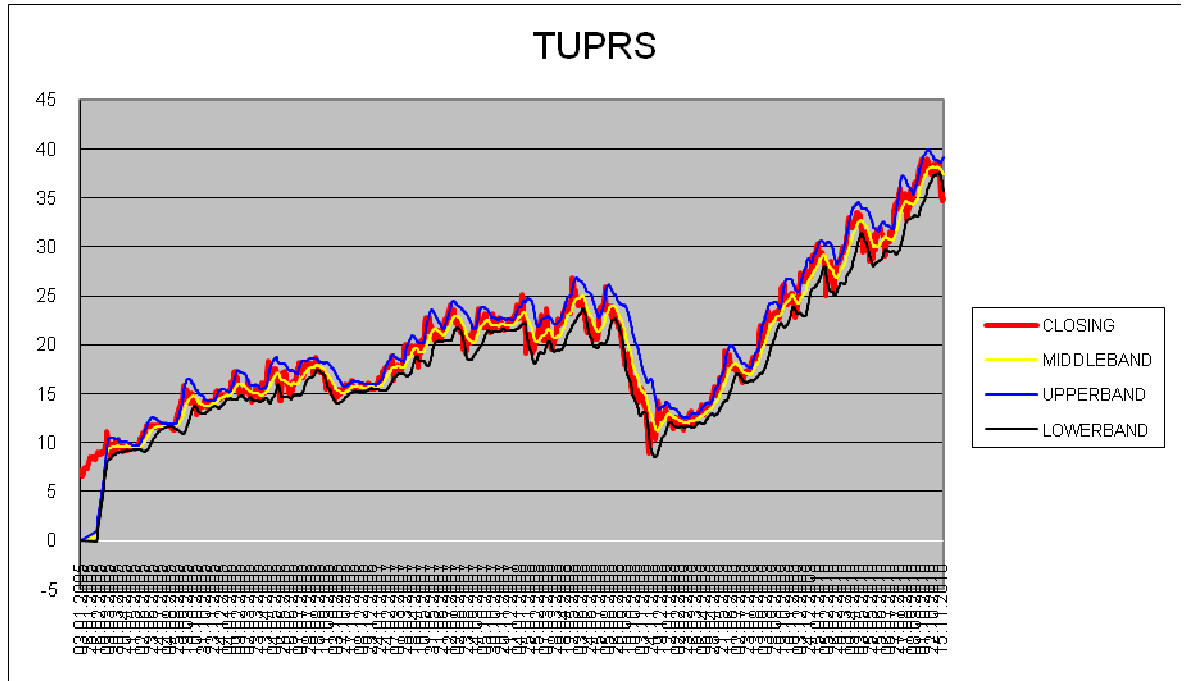
Appendix XIX TEB



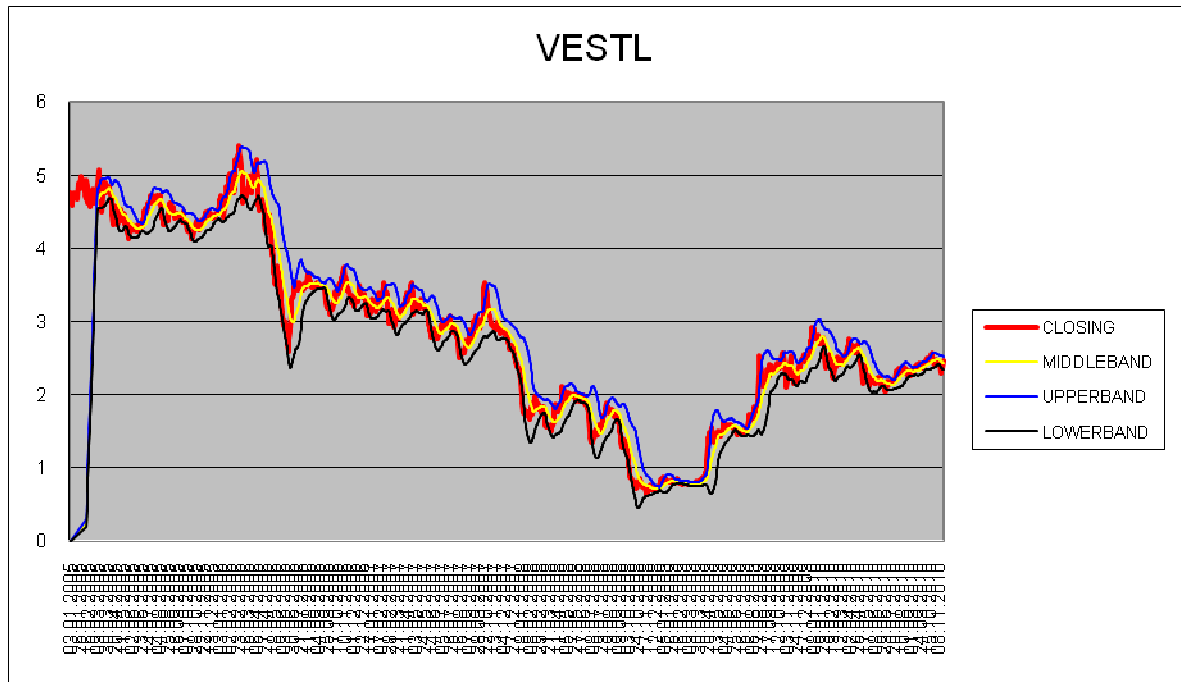
Appendix XX Türk Hava Yolları



Appendix XXI TÜPRAŞ



Appendix XXII VESTEL



Appendix XXIII YAPIKREDİ

