
Foreign Influence in Turkish Stock Market
Sıtkı Sönmezer
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Summary

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List of Abbreviations

AMEX	American Stock Exchange
CAPM	Capital asset Pricing Model
CPI	Consumer Price Index
EBIT	Earnings Before Interest and Tax
GDP	Gross Domestic Product
IMKB	Istanbul Stock Exchange
ISE	Istanbul Stock Exchange
M&M	Modigliani and Miller
NASDAQ	National Association of Security Dealers Automated Quotation System
NAV	Net Asset Value
NFPI	Net Foreign Portfolio Inflow
NMS	National Market System
NYSE	New York Stock Exchange
REPO	Repurchasing Agreement
S&P 500	Standard and Poor's 500
WACC	Weighted Average Cost of Capital

Introduction

The scope of this thesis is the effects of foreign order flow and resulting change in the liquidity levels, on stock returns. Even though there are numerous studies about the effects of order flow on stock prices and the relationship between liquidity and stock prices have also been studied widely in the literature, the impact of foreign participation on a market is relatively undermined in the literature. One of the reasons may be the fact that the differentiation of order flows as domestic flows and foreign flows became popular in the last two decades when foreign investors increased their significance and dominance in these markets. Developing Information Technology and pervasiveness of internet enabled funds to flow in and out of countries and consequently, researchers aimed to assess whether foreign funds are detrimental or not to the markets they study. Moreover, the existing studies that examine the effects of order flows mostly cover the developed markets where foreign funds are usually a minority but ISE is heavily dominated by foreign funds, the participation rate of foreigners equal to % 66.55 as of 20-11 2009 and this market may give out promising outcomes as it is an emerging market that doesn't have much prominence in the related literature.

Base broadening hypothesis of Merton (1987) implies that as investor base increases, risk decreases due to risk sharing and increased liquidity and thus, prices may enjoy a permanent increase. However, an alternative hypothesis of Warther (1995) which is called Price Pressure hypothesis implies that funds arrive to markets in order to benefit from the temporary illiquidity the markets are facing, they provide funds and try to reap the profits in short term and therefore, price reversals are likely to follow when any overselling occurs at a market. Normally, it is expected to observe positive coefficients for contemporaneous Foreign Portfolio

inflows and negative coefficients for the lagged Foreign Portfolio Inflows in order to be able to address Price Pressure in a market if any.

In one hand, a possibility of a significant return gained by supplying the needed liquidity to the market, interests this study from the aspect of manipulation and investment as providing liquidity as such can lift up prices so that "unfair" profits can be realized. In that case, it can be argued that this kind of a foreign trade may be detrimental to ISE; to clarify how detrimental these kinds of flows can be to the market; assume that foreign fund providers know in advance that they can benefit from overselling by providing the funds mentioned above, then they may pressure the market downwards and manipulate the herding behavior in the market and bring the prices of the securities to levels desired. They may distort the market sentiment and affect the psychology of investors, how the psychology of investors influences prices and behavior of investors is discussed in the second part of this thesis.

On the other hand, these profits are not necessarily unfair but they are earned due to the incompleteness of the market. Similarly, during down trends, when the free float is low, overselling may decrease the prices by more than they should have and providers of the stocks may create an opportunity of buying back the shares at lower costs. The above mentioned rationale is defined as short selling when the investor borrows the securities to sell with the promise to purchase them back later on the same day.

In ISE, short selling positions are alerted on screens and short selling positions have to be offset in the same transaction day, otherwise a penalty interest is charged. Thus any harm done regarding with short sales is mitigated with the delinquency charged to the short seller. In US markets, investors do not face constraints as such, they can carry their open positions to next days but they have much deeper markets. In Turkey, Regulations don't allow investors to extend their short positions to the next day to prevent the market from large fluctuations. Keeping in mind that markets like ISE are not as deep as US markets, if an unfair competition as such can be determined and verified, regulations on these issues may be discussed and preventive measures may be advised for regulatory purposes. This study aims to clarify whether these profit potentials are exploited by foreign investors or not and determining which hypothesis mentioned above is valid in ISE.

Intuitively, there may be other factors affecting prices other than foreign flows. Alternative investments may be taken into account when determining the effect of foreign flows on security prices. There may be factors such as inflation rates, growth rates etc that may explain returns but this study elects to constrain these factors with alternative investments' returns. It is expected to find less significant coefficients of foreign flows once these neglected factors are incorporated in the regression used in base broadening hypothesis testing.

Foreign investors and their investing strategies are also aimed to be well introduced. The study aims to show evidence that foreign funds are implementing positive feedback trading in which case they are momentum traders; or they may be implementing negative feedback trading in that case, they have contrarian strategies compared to the market; or they may refrain from any kind of feedback trading in ISE. Another aim of the study is to identify foreign funds' strategy in ISE.

The time period used in this study contains the crisis in 2008. This situation may be beneficial from some aspects; liquidity dries out during crisis periods which is good to test price pressure effects if there are any but when the sample period contains a crisis period, the outcomes may be questionable as any inferences from that sample period may not reflect the outcomes of 'normal days'. For robustness purposes, each hypothesis is tested by excluding crisis period and results are compared.

There is various liquidity measures used in the literature. In this study, these measures are analyzed with the aim of introducing the notion of liquidity and having a better understanding of temporary illiquidity thus, this study tries to investigate the relations between the order flow, liquidity level and stock prices. Such a relationship may help regulators when they are monitoring price distortions and it may also help investors who want to be informed about how vulnerable the market is to external shocks, when liquidity dries out and how they may benefit from reversals. Fund managers and pension funds may also be interested in the relationship as CAPM may not answer all their questions due to its flaws and liquidity may be a global factor affecting stock prices rather than a factor embedded in the systematic risk of CAPM.

Theories and hypothesizes related with stock returns and factors affecting stock returns are introduced thoroughly in the first section; in the second part, Liquidity, a factor affecting stock prices, is reviewed in detail with previous studies in the literature; In the third part, the history and the structure of foreign participation in ISE is assessed as well as the portfolio strategies of foreign investors; in the fourth part, data and methodology is presented for the hypothesizes that are tested; in the fifth part, the results are shown and discussed and in the final part, a conclusion is derived from the outcomes of the tested hypothesizes.

This study aims to address the effects of monetary expansion of funds and extra ordinary sales of the securities on the liquidity level of the market and on the prices of securities. How prices can be affected in the market when liquidity dries out and when extra liquidity is injected to the market is our concern in our study. The rationale behind investments in emerging markets is addressed here below with a brief outlook on the history of foreigners in ISE.

There was a significant increase in the trade volume and the share of foreign funds in ISE in the last decade due to several reasons. In the year 1997 the purchases were 4,292 million $ and sales were reaching to 4,609 million $. The share of Equity investments by foreign investors were 38.9 % of the total. There was an increasing trend both in the volume foreign investors make and the share they possess in ISE.

At the end of 2005, their share has increased to 66.6 % and the purchases have increased to 42.539 million $. Sales of foreign investors have reached to 38,464 million dollars. It is clear in the table below that the transactions of foreigners have increased roughly ten times in less than a decade and it has to be noticed that other than the crisis years of 2000 and 2008, foreign funds either increase their investments in ISE or keep it as it is.

Table 1. *Net Foreign Portfolio Inflow in ISE*

Year	Purchases	Sales	Net (NFPI)	Volume
2009*	30.015.821.157	28.857.014.719	1.158.806.438	58.872.835.876
2008	75.851.699.109	78.050.535.437	-2.198.836.328	153.902.234.546
2007	65.267.267.190	62.925.911.072	2.341.356.118	128.193.178.262
2006	47.580.752.929	46.135.900.493	1.444.852.436	93.716.653.422
2005	42.539.523.011	38.464.978.098	4.074.544.913	81.004.501.109
2004	19.334.544.267	17.849.072.899	1.485.471.368	37.183.617.166
2003	9.171.587.237	8.161.604.403	1.009.982.834	17.333.191.640
2002	6.427.045.047	6.441.991.360	-14.946.313	12.869.036.407
2001	6.323.581.799	5.814.986.904	508.594.895	12.138.568.703
2000	15.138.182.717	18.272.297.232	-3.134.114.515	33.410.479.949
1999	9.451.722.565	8.427.662.673	1.024.059.892	17.879.385.238
1998	5.624.065.771	6.042.646.298	-418.580.527	11.666.712.069
1997	4.292.252.427	4.609.139.160	-316.886.733	8.901.391.587
Total	337.018.045.2	330.053.740.748	6.964.304.478	667.071.785.974

Source: IMKB (in TL)* as of November

The share of foreign investors has reached to 72.33 on 14 October 2007 to its peak and as of first half of 2008, it was around 70 % but after the crisis of 2008 the foreign share has leveled around 65 %. Interestingly, despite the fall of ISE 100 of more than 100 percent during the crisis, foreign funds resisted to the motivation to sell and kept their market share almost the same.

The above mentioned reality clearly indicates that foreign investors bring liquidity to the market as their interest in ISE grows gradually. The rationale behind this interest may be the relatively higher growth rates that market offers thus higher income potential; or the diversification benefit that lowers the risk of foreign investors; or most of the companies are potential merger and acquisition targets and usually stock prices rise when an offer is due and foreign investors may invest for the possibility of any acquisition that may take place in the near future.

Additional rationales behind the investments in emerging markets are the recent changes in the circumstances of developed countries. Nineties and early years of the new century were an era of crisis ranging from Argentina to South East Asia, including various countries such as; Turkey and Russia. Most of these crises were severe and contagious indicating a more integrated world economy as a result of globalization.

Developed countries mainly United States of America, were seen as a safe haven for funds due to the fragile structure of emerging markets. Most of the emerging markets lacked the required credit rating to be invested in for the foreign funds as the default risk involved was not negligible and emerging markets were comparatively incomplete.

Starting from 2003, developed countries continued with relatively lower interest rates and lower inflation but started to eye emerging markets for substantial excess profit opportunities and diversification benefits. Another reason for the investments in emerging markets is the changes in the circumstances of developing countries.

Lack of stability is a great obstacle against foreign direct investment and inflow of foreign funds. Even though funds arrive to a market that is known to be instable, they may arrive for shorter terms and their outflows may be bloody for the financial system. Regulatory bodies in certain countries have tried to mitigate the adverse effects of these outflows via modifications of various legislations however, neither of them could successfully prevent funds from exit and neither of them helped economies to convince foreign funds to stay for longer periods. Emerging markets mostly have budget deficit and are prone to external shocks. Barry & Hausman (1999) used the term original sin to describe the historical inability of emerging markets to borrow long term and fixed rates in their own currencies due to histories with macroeconomic instability.

Hence, these countries were obliged to borrow in foreign currencies with floating rates, mainly short term or medium term the most. In recent years, this – original sin seems to have receded in the emerging world. Emerging countries try to extend their fixed-rate yield curves in domestic currencies.

In 2006, Mexico issued its first 30-year fixed-rate peso dominated bond to her domestic market and in 2007; Brazil issued its first 20-year fixed-rate real-dominated bond to investors. The other emerging countries such as Turkey, Russia, extended their term structure via Eurobonds. These achievements increased the credibility of emerging markets and may convince foreign fund's managers to increase their weights in the emerging equity markets.

Foreign funds arrive to a market not only for the stock market but also for the money and bond markets in which the nature of financial system, level of inflation, debt levels, fiscal deficits, credibility and structure of the economy are among the factors that affect the level and volatility of a country's interest rates and security prices. In the second part of this thesis, these factors that may affect security prices are briefly described so that in the econometric analyses, it will be clearer and easier to understand the relation between returns and independent variables.

One of the aims of this study is to present the liquidity effects of foreign funds in ISE. Diversification benefits and merger and acquisition issues regarding with foreign funds may be interesting to search but our study is constrained with the price pressure effects of foreign investors.

ISE is an order driven market and there are no market makers such as Japanese markets, there are two sessions in a day and price floors and caps (-/+ 10 % from averages) are present. Rationale behind the selection of ISE for testing Hypothesizes may be explained in more details but briefly, Turkish market is an interesting emerging market to investigate due to the reasons you can find here below:

Tax Advantage- Turkey is attractive and unique in the tax advantage she provides for the foreign investors; Starting with the beginning of the year 2006, for five months, regulatory bodies enforced a tax on foreign transactions in order to provide an obstacle against the imminent and devastating foreign outflows. Foreign investors would refrain from repatriating their funds which would decrease the fluctuations in the market. The levied tax would also decrease the motivation of rebalancing and short term investments due to increased transaction costs arisen. This plan was reasonable and parallel to the similar plans adopted by other similar regulatory bodies. The common aim in these plans is to avoid market crashes due to foreign outflows rather than raising tax income. However, the plan did not work out; foreign fund managers were tense with the new taxes and started to sell stocks and regulatory bodies could no longer resist the risk of further crashes and eliminated the tax as of May 2006. From then on, foreign funds enjoy a tax free environment which converted ISE to a `fruitful haven` rather than a safe haven for foreign funds with high growth rates, strong currency and diversification benefits.

Foreign participation in ISE, after reaching to its peak of 72 %, has remained close to its high values (66 % as of 20 September 21, 2009) and more importantly, the percentage remained at these levels during the global crisis in 2008. Foreign funds have not repatriated for the first time in the recent history of ISE. This may be partly due to the tax advantage.

High Growth/Return Potential – Turkish economy enjoyed higher growth rates after the crisis in 2001 which drew attention of the multinationals, banks and funds that are stuck with the lower return potentials of the developed countries. Surely, they directed their investments to China which has even higher growth rates than Turkey but they directed increasing amount of investments to Turkey to mitigate risks. Other than diversification benefits, Turkey with her population, location and consuming behavior attracted banks and other foreign direct investments as well. Majority of the national banks have been acquired by European banks which have led to a more resilient financial system in terms of capital adequacy. The tradeoff between the loss of profits sold to foreign banks and the more robust financial system seems to be paying off as Turkey survived through the global crisis of 2008 without IMF funds and programs. This may possibly draw more foreign funds due to the perception of lower country risk. When risk falls, the price of the securities increase and foreign funds may be attempting to reap these return potentials.

To better evaluate the conditions of foreign fund managers and to have a better insight to the period, this thesis provides Table 2 which can be found here below:

Table 2. *Comparison of ISE, S&P 500, and FTSE with Growth Rates*

Year	ISE 100 in $	ISE 100 Return (%)	Real GDP Growth rate (%) In	S&P 500 in $	S&P 500 Return (%)	Real GDP Growth rate in US. (%)	FTSE in £	FTSE Return	Real GDP Growth rate in UK. (%)
2000	1982.2	-55	6.8	1394.5	-2	4.1	6268.5	0.1 %	3.9
2001	892	-30.9	-5.7	1366	-17.3	1.1	6297.5	- 18 %	2.5
2002	616.7	-31.8	6.2	1130.2	-25.3	1.8	5164.8	-31 %	2.1
2003	420.7	115.6	5.3	855.7	32.1	2.5	3567.4	23.1%	2.8
2004	907	41.4	9.4	1131.1	4.4	3.6	4390.7	10.5%	3.0
2005	1282.3	60.7	8.4	1181.3	8.4	3.1	4852.3	18.7%	2.2
2006	2061.1	-3.9	6.9	1280.1	12.3	2.7	5760.3	7.7 %	2.9
2007	1980.6	72	4.5	1438.2	-4.2	2.1	6203.1	-5.2%	2.6
2008	3407	-61.2	1.1	1378.6	-40.1	0.4	5879.8	-29 %	0.6
2009	1321.7	86.2	-5.8(f)	825.9	29.3	-4.6(f)	4149.6	24.7%	-2.5 (f)
2009 18/9	2460			1068.3			5172.9		

Source: IMKB, Data extracted on 03 DEC 2009 13:24 UTC (GMT) from EuroStat) (f) – forecasted

Probable European Union Membership - the promising story of Turkey who is a candidate for European Union and this incremental return potential has brought significant liquidity to ISE in the recent years. Even though, the recent attitude and statements of French and German Prime ministers are discouraging, continuing negotiations are believed to symbolize strength of the country, economy and the state because even if Turkey is far from being close to full membership to EU, negotiations indicate that Turkey is showing effort to close the gap between the developed countries with the ongoing discussions on chapters. This reality may decrease the country risk factor and when the risk is lower, returns will probably be higher.

There may be various other reasons for foreign investors to allocate funds to ISE. This study aims to quantify the power and significance of the foreign liquidity by testing its impact on security prices. There are various studies regarding with order flows and prices, however, foreign participation and prices have not been much of a concern in the literature other than the recent decade. This may be due to several reasons;

Foreign funds weren't as dominant as today in emerging markets due to relatively higher transaction costs, information costs or higher risks involved in such investments that's why the study of the effects of foreign funds on stock markets might not be as important as it is today. The second reason may be the unavailability of reliable and timely data; internet, data warehouses, and computerization in emerging and developed markets enabled researchers to gather data they need promptly these days. However, earlier, even if it was possible to bring together the data needed, it probably used to take too much time that might question the relevance of data used which has probably caused researchers to refrain from these studies due to their increased relevance concerns.

The third reason may be the fact that earlier emerging markets were not an efficient investment option for the majority of foreign funds. Emerging markets had comparatively higher risks and proposing lower average returns. In other words, they were 'junk' despite their diversification benefits. Particularly in the last decade, return potentials and growth rates in developed economies fell much behind the emerging economies and funds in US and Europe, especially hedge funds, have started to seek for investment alternatives in emerging markets. Then, researchers realized foreign funds' tendency to invest outside 'safe havens' and started to study these emerging markets as well.

1. Literature Review

Hypothesizes tested in this thesis are namely, Base Broadening Hypothesis, Price Pressure Hypothesis, Omitted Variables Hypothesis and Feedback Hypothesis. Each Hypothesis has been studied in various markets in the literature and the results of these studies are briefly presented including studies regarding with foreign trading here below;

1.1. Base Broadening Hypothesis

Merton (1987) introduces a model that indicates how broadening the investor base for a stock, and by extending it for emerging equity markets, may increase stock values permanently through risk pooling. The model assumes an environment with no tax, no transaction costs, and no restriction on borrowing and lending (Merton 1987). Chen, Noronha, & Singal (2002) find evidence of a permanent price effect that base broadening hypothesis predicts due to an increase in the number of shareholders.

Briefly, broadening the investor base increases risk sharing and foreign investors benefit from diversification, lowering the required risk premium for those securities. The influx of 'others' may also lower the perceived liquidity risk of the stock market. Merton argues that foreign investors are 'informed' and they invest only in securities that they have material information and shows that if foreign funds had 'information' about all the stocks in the market, the CAPM pricing relation would hold and expected return on security would be then the function of its covariance with the global market.

Securities with narrow investor bases show higher expected returns because for the owners of these securities the variance of the returns on the securities is more

systematic than it appears from the Perspective of the market as a whole. Merton's return equilibrium is here below:

$$E(R_k) - E(R^*_k) = \lambda_k (E(R^*_k)/R)$$

Where $E(R_k)$ is the equilibrium expected return on the k^{th} security in the segmented market condition, $E(R^*_k)$ is the expected return in the absence of segmentation restrictions, R is the risk free rate and λ_k is the shadow cost of the segmentation restriction. λ_k is shown as:

$$\lambda_k = \delta\sigma^2_k x_k(1-q_k)/q_k$$

where δ is the coefficient of aggregate risk aversion, σ^2_k represents idiosyncratic part of the variance of the k_{th} stock's return, x_k, is the weight of the k_{th} stock in the aggregate market portfolio, and q_k is the share of the total investor universe that invests in stock k (Merton 1987). Merton (1987) shows the increase in the investor base (i.e. q_k increases) equilibrium required returns decrease, and prices (P_k) increase; as follows: (Merton 1987; p.496)

$$\acute{\alpha}P_k/\acute{\alpha}q_k = P_k\delta\sigma^2_k/q^2_k > 0.$$

If it is desired to convert this equation for Turkish Market, Merton's q may give the ratio of the number of investors that are 'informed' about ISE stocks to the total number of investors:

$$q = n_t + n_f^i/N$$

Where n_t may be the number of Turkish investors who are expected to be informed about Turkish stocks), n_f^i may be the number of foreign investors that are informed about Turkish stocks, and N is the total number of investors.

As it is impossible to reach the data on q, this study elects to use two different proxies for the presence of non-domestic funds; one is the percentage change in foreigner's share in ISE according to market capitalization, which is defined as MSF, the other one is the percentage change in foreigner's share in ISE according to the total number of shares outstanding which is defined as TNS.

Base broadening hypothesis has been tested in various markets, intuitively, the rationale behind base broadening hypothesis is robust but straight forward therefore the hypothesis is usually tested with the complementing hypothesis of omitted variables hypothesis which either usually weakens base broadening hypothesis. Clark & Berko (1996) have studied Mexican market and have presented evidences of Base Broadening for the period under study. They have used Net Foreign Portfolio Inflow (NFPI) as the independent variable which is calculated as difference between foreign purchases and foreign sales. Dahlquist & Robertson (2004) studied foreigner's trading and their price effect on Swedish market. They show evidence that there is a strong correlation between foreigner's transactions and market returns. They show evidence that foreign purchases caused a permanent

increase in stock prices as they decreased the cost of equity of the firms by roughly 2 % which is consistent with base broadening concept. They have found little evidence of informed trading on foreign investors' behalf and suggested that the decrease in the cost of capital may be explained by risk sharing.

Adabag & Ornelas (2006) have studied ISE Whole Shares Index for the period 1997-2004 and they have shown evidence that base broadens with foreign purchases in ISE in the short term but their conclusion may not hold in the long run.

1.2. Price Pressure Hypothesis

Price Pressure Hypothesis originally used to be associated with divestiture in the literature. Companies that are selling their own shares that are listed on organized exchanges for the second time may push the market prices down and the price pressure of these new issues were to be tested. Scholes (1972) have introduced two important alternative hypotheses for perfect capital market hypothesis; price pressure hypothesis that predicts prices to move away from their fundamentals temporarily to compensate liquidity providers and price reversals are expected within a short term; long run downward sloping demand curve hypothesis which is beyond the scope of this thesis. Scholes have studied price pressure regarding with these large block sales and discussed that small trades do not change the market prices whereas, large ones may. Additional share issues were originally assessed by Lintner (1962) who claims that market value of shares shall decrease to attract existing shareholders and new investors to the new issue therefore price pressure on the sell side would predict more price effect for larger sale of shares.

Atkins & Dyl (1990) and Cox & Peterson (1994), confirmed that price reversals occur in individual stocks following huge stock prices falls. Previously, Kraus & Stoll, (1972), show evidence that large individual block sales are followed by price reversals while large buys are not.

When a market is not efficient and when prices can be distorted, investors can create trade imbalances to pursue and extract excess profit. They can create an imbalance either increasing the number of buy orders or sell orders when orders are balanced or they can either balance the imbalance by providing the adequate liquidity when for instance, sell orders dominate the market on a particular share.

Price pressure regarding with the stock prices has been studied from different aspects in the literature; Brown & Brooke (1993) have studied the price pressure effects of spin-offs exerted on stock prices and they show evidence that when institutional investors sell their shares in new spin-off firms, they pressure the prices of those securities temporarily but significantly. They show evidence that block trades of institutional investors may devalue a firm's value. Harris & Gurel (1986) show that stocks that are listed to NYSE Index enjoy a 3 % increase upon

announcement but the rise is temporary and price reversal occurs in the following days as price pressure hypothesis predicts. Elliot & Warr (2003) provide evidence that the listing day returns are rapidly reversed for NYSE stocks which is in line with price pressure hypothesis however the evidences show that, it is not the case for NASDAQ stocks which supports the base broadening hypothesis.

Pruitt & Wei (1989) present further evidences supporting price pressure hypothesis with respect to the correlation between changes in institutional holdings and changes in the index. Mitchell, Pulvino & Stafford (2004) have studied the price pressure on securities with respect to mergers. They suggest that Stocks' supply curves may not be fixed or vertical around mergers as short selling motivation increases around merger announcements and they provide evidence that short selling of acquirers' stocks leads to a downward price pressure on stocks temporarily.

Campbell, Grossman, & Wang (1993) show evidence that returns accompanied by high volume tend to be reversed more strongly and they explain how this result is consistent with a model in which investors may acquire excess returns by accommodating the liquidity needs of others. Campbell et al, submit a model in which investors accommodate order flow from liquidity motivated investors who buy at lower rates and sell high and therefore, are compensated with relatively higher expected return. Campbell et al (1993), provide evidence that compensation is greater when the order flow is greater and these findings support and probably form a base for price pressure hypothesis that Warther put forth in 1995.

Regarding with ISE, Price Pressure has been studied from various aspects as well. For instance, Kiymaz (2002) has studied price pressure depending on the rumors that are documented on specific stock market columns and his data could not support any significant price pressure on stock prices arising solely from rumors. Kiymaz also have noted that small firms are more prone to speculative attacks and more sensitive to price reversals in ISE. Bildik & Gulay (2008) have tested price pressure hypothesis in ISE with respect to changes in index composition. Their results show that once a particular stock is listed or deleted from an index, a price reversal is likely to occur which is consistent with the price pressure hypothesis.

Similarly, Institutional trades and foreign trades may be regarded as new issues, rumors, mergers or changes in index composition, etc. and despite the rationale behind the base-broadening hypothesis, Warther (1995) has put forth another alternative theory derived from Price Pressure Hypothesis. The hypothesis suggests

that foreign inflows are to eradicate temporary illiquidity and therefore price increases resulting from these inflows should be reversed in the coming periods[1]

Clark & Berko (1996) have found that unexpected inflows of 1% of the market's capitalization, leads to an increase of 13 % in prices in Mexican market. Dahlquist & Robertsson (2004), has presented similar evidence of 10 % with their monthly data from the Swedish Market and Richards (2005) who used daily data, strikingly finds the 38 % price increase for the 6 Asian Markets he studied. Similarly, Warther (1995) examined aggregate monthly inflows into mutual funds and how they affect stock prices and his study shows evidence that a 1% increase in mutual fund equity assets results in a 5.7% increase in stock prices. Whether these increases are temporary or permanent is the focus of recent studies.

Clark & Berko (1996) studied the price pressure of foreign funds on security prices in Mexican market and they couldn't find supportive evidences for price pressure hypothesis. Dahlquist and Robertson studied foreigner's trading and their price effect on Swedish market but they are unable to show any evidence of price pressure in Swedish market still they found positive lagged returns which are speculated as the timing ability of foreigners by the authors.. The study of Adabag & Ornelas (2005) and Baklacı (2009) both rejected the price pressure hypothesis in ISE. Adabag & Ornelas (2005) , who used a data of ISE All Shares Index for the period February 1997 to September 2004, have found positive coefficients of lagged flows of foreigners none of them were significant other than fourth lag. On the contrary, Baklaci (2009) who has studied 20 stocks for the period between 1 Dec 2005 to 11 March 2008; claims that price pressure is present only in some of the stocks examined..

1.2.1. Price Reversals

The main reason of an extremely large change in the price of a security during a single day should be an unanticipated, a new information released regarding with the security unless manipulation is the case. The behavior of prices of securities to such information provides an opportunity to investors when prices can not adjust accurately and timely as efficient market theories claim that they can. It is very optimistic to expect markets to assess the long run effects of the new information accurately on the day the news is released therefore a mispricing may be fairly expected. The effects of the new information may be under estimated or over estimated by the market and there may be a subsequent reversal in the market or trend may continue further depending on how positive or negative the information is.

[1] As Turkish market is an emerging market and as it has relatively less liquidity compared to other markets, temporary illiquidity hypothesis intuitively seems more promising to have interesting outcomes.

When it is assumed that there is a mispricing, the question becomes whether or not to invest in that security because the return from the investments in those securities must justify for the risk they bear and all costs arising from the transaction shall be taken into account. If it is possible to provide sufficient evidence that prices don't adjust rapidly to new information in a market, then it is possible to conclude that the market is not efficient. Most of the studies in the literature examined the markets from the states and they support the view that the US market is weak form of efficient.

Atkins & Dyl (1990) examined how stock prices move after a large price change in a single trading day and provide evidence that stock markets are overreacting to sharp movements in the prices of stock markets, they point out that overreaction is more obvious when there is a sharp decline in prices however, they conclude that the magnitude of over reaction is not sufficient to invest in those securities when bid-ask spreads are taken into account as the effect of transaction costs are crucial in assessing the potential to earn abnormal returns by exploiting foreseen stock anomalies. Their findings that incorporate transaction costs indicate an efficient market.

De Bondt & Thaler (1985) have tested the overreaction behavior of the stock market. They set two portfolios; one of them is composed of stocks that have previously had abnormal negative returns ("losers") and the other one is composed of stocks that are filled with stocks that have abnormal positive returns ("winners"). They show that after the sharp decline, losers earn positive market-adjusted returns, and winners perform worse than the market after their rise. They conclude that they have found substantial weak form market efficiency.

Overreaction issue has attracted the deserved attention of numerous academicians. Even though, majority of the studies supported the conclusions of De Bondt and Thaler, some studies questioned the validity of their conclusion. Among them; Chan (1988), proposes that the risk of past winner stocks and past loser stocks vary over time and claims that De Bondt's and Thaler's results are partly due to inappropriate measurement of risk. Despite the counter arguments including size effect, stock market seasonality and the ones mentioned above, it is fair to assume the likelihood of a price reversal following a sharp decline or rise in the prices of securities because overreaction is usually the case when an unexpected information is released and contrary to efficient market theory, prices cannot be accurately set due to the hardship in evaluating the new information both in the short and long run

Zarowin (1990) sorts common stocks according to their monthly performance and show evidence that in the following month, portfolio of the losers outperform the winners by 2.5 % ($t = 10.54$). He reaches to the conclusion that market is weak form of efficient even in the short run.

1.2.2. Market Overreaction

Overreaction hypothesis is defined as the over response to new information by DeBondt & Thaler (1985). According to the hypothesis extreme fluctuations in stock prices are followed by movements in the opposite direction to correct the initial overreaction and the offsetting reversal is stronger when the magnitude of initial price change is greater. These reversals have been studied by Brown, Harlow, & Tinic (1998) and Atkins & Dyl (1990) who find significant reversals for securities that experience one day price declines. Bremer & Sweeney (1991) study returns following one-day price declines of 10 % or more for 500 firms and find significant positive three-day abnormal returns and note that this reversal is inconsistent with the efficient market hypothesis that assumes stock prices fully and quickly reflecting released information. They suggest that this may be partly due to market illiquidity.

Cox & Peterson (1994) studied stock return behavior following large one day declines and attempted to identify the role of the bid-ask bounce, market liquidity, and overreaction in explaining the reversals in the three day period just after the extraordinary day. Bid-ask bounce concept may need to be clarified. When there is a huge decline in the price of a security, there is a bigger probability that the closing price has occurred from the bid price due to the heavy selling pressure; Possible reversal in the next day may be partly due to this above mentioned bid-ask bounce.

Despite the selling pressure, suppliers of liquidity may elect to purchase shares that normally they wouldn't buy in the pursuit of profits with the expected reversal. They have noted that short run price elasticity of the supply of liquidity determines the magnitude of these reversals. They tested the hypothesis that 1) there are stronger reversals in less liquid markets 2) there are stronger reversals for smaller firms than larger firms 3) there is a reduction in the degree of reversals through time as markets become more liquid due, for example, to a large number of traders and lower transaction costs. In other words, they explored the role of size, exchange listing and time in explaining reversals after a large decline in one single day. Moreover, they further investigate the price behavior of securities following a large decline for three-day period; furthermore, they examined the reversal effects for 4-20 day period in order to understand whether the reversal process continues or not. They find that small firms reverse more than large firms; they find no evidence for the hypothesis that larger initial declines lead to larger subsequent reversals; they find that reversals diminish by time; they find that securities are inclined to have negative abnormal returns subsequent to the three days following the date of the large price drop showing that recovery process is reversed. Bid-ask bounce and market liquidity are found to be important factors in the reversal process.

1.2.3. Measurement of Returns Arising from the Price Reversals

In order to differentiate the returns from reversals and normal return, various models are formed and in order to exemplify; Cox & Peterson (1994) have used a model to estimate the post drop return which is presented here below;

$CAR_i = \alpha_0 + \alpha_1 ARO_i + \alpha_2 SIZE_i + \alpha_3 DAMEX,_i + \alpha 4 DNMS,_i + e_i$

Where;

CAR_i = the post drop cumulative abnormal return for security i,

ARO_i = the event day abnormal return for security i,

$SIZE_i$ = the size index variable for security I, calculated six days prior to the event day.st

$DAMEX,_i$ = a dummy variable equal to 1 if security i is an AMEX firm, and equal to 0 otherwise,

DNMS,i = a dummy variable equal to 1 if security i is an NMS firm, and equal to 0 otherwise,

α's = parameters to be estimated, and

e_i = error term for security i.

α_1 will be negative when there is an overreaction magnitude effect where firms with the greatest losses tend to have the largest subsequent reversals and α_2, α_3, α_4 will differ from zero if exchange listing or size have any correlation with abnormal returns following large one-day stock price drops.

There are significant cumulative abnormal returns at the end of the third trading day after the drop for the six period used in the empirical study Cox et al, (1994) for both NYSE and AMEX securities. For NYSE securities the magnitude of reversals tends to decrease by time which conforms to the hypothesis that increased market liquidity through time reduces the magnitude of the reversals. Interestingly, four of the six periods under study reveal that for days 4 through 20, there are significant negative average cumulative abnormal returns from which investors who bet on reversals may infer that they shall be fast in realizing their returns, if there are any, otherwise, their portfolio may even lose value as three out of the six periods under study have significant negative values even exceeding the positive return that has occurred in the first three days.

Daily abnormal returns are calculated by subtracting the value weighted (compared to NASDAQ firms) CRSP index return from the firm's raw return and multiplying it with the average of the pre-event and post-event betas. Cumulative abnormal returns are formed by summing daily returns.

1.3. Feedback Hypothesis

The feedback hypothesis suggests that investors evaluate the recent information on prices and make transactions according to the recent information. There are two forms of feedback trading; a positive feedback strategy suggests that foreign

investors sell when there is a decline in the market and they buy stocks when the market is rising. Similarly, negative feedback refers to selling when the market is buying and buying when the market is selling.

Positive Feedback trading may be problematic for a market because the volatility of a market increases as investors continue purchasing and moving the prices away from weighted averages or from their intrinsic values. Therefore, when foreign investors' trading behavior has been studied, it is aimed to show the influence of those trades on the markets and if these studies are able to show evidence of positive feedback trading then they may conclude that foreign funds have a destabilizing effect on the market as they move the price of securities away from fundamentals; when prices are vulnerable to speculative attacks as such, than individual investors may panic and may act irrationally as mentioned briefly in the first section of this thesis. Aside from these psychological factors, positive feedback traders sell when market sentiment is down. In that case, liquidity levels would be lower than it should have and once again individual investors may have difficulty in liquidating their assets as liquidity premiums increase and if they show evidence of negative feedback trading, then they argue that foreign funds smoothen the volatility of the markets they flow in and they are beneficial to the well being of the market as they are bringing the prices of securities to their fundamentals. In that case, foreign trading helps individual investors as trades will be made at prices that are close to fundamentals. Secondly, as negative feedback trading is like acting against the market sentiment, it may reduce the volatility in the market which may be interpreted as reduced risk for individual investors. There are also studies that found no evidence of feedback trading in the markets under study. The interpretation of these results may be the resilience of that particular market or the fact that positive and negative feedback traders offset each other. To summarize some of the previous studies regarding with feedback hypothesis, Table 3 is produced, which can be found here below:

Table 3. *Summary of Results of Earlier Studies of Feedback Hypothesis*

Author(s)	Year	Country	Behavior of Foreign Investors	Individual Investors	Pension Funds
Clark & Berko	1996	Mexico	No Positive Feedback Trading		
Chen	2002	Taiwan	Positive Feedback Trading		
Dahlquist & Robertsson	2004	Sweden	Positive Feedback Trading		
Choe, Kho & Stulz	1999	South Korea	Positive Feedback Trading		
Adabağ & Ornelas		Turkey	Negative Feedback		

	2005		Trading*		
Lakonishok, Shleifer & Vishny	1992	US			Positive Feedback Trading**
Shefrin & Statman	1985	US		Negative Feedback Trading	
Odean	1998	US		Negative Feedback Trading	

* Weak evidence of negative feedback trading; ** Only in small cap stocks

Researchers examined Feedback Trading with Foreign Investments, Individual Investors, and Pension funds. The study of Adabag & Ornelas (2005) on ISE indicates a weak negative feedback trading of foreign investors and they conclude that foreign funds are beneficial.

Negative feedback hypothesis suggests a contrarian strategy. Warther (1995) analyzed U.S. mutual fund flows and suggested to regress surprise inflows on lagged returns in order to show evidence for feedback trading and he noted that if the positive feedback hypothesis is true, the correlation between flows over the month and the returns during the first week of the same month and last week of the previous month should be higher than the correlation between monthly flows and returns during the last week of the same month.

Adabag & Ornelas (2005) have used two approaches in detecting positive feedback trading; they have tested whether the lagged coefficients of returns are significant in the equation they have used to test Granger causality which is shown here below:

$$NFPI_t = c_0 + \Sigma^n_{i=1} \delta_i NFPI_{t-i} + \Sigma^n_{i=0} \beta_i Return_{t-i} + e_t$$

Dahlquist & Robertsson (2004) have also used this approach but they have used excess returns rather than net foreign portfolio investments. This approach is relatively easier and straight forward; if the lagged coefficients are not statistically significant, the feedback trading hypothesis is rejected; if one or more than one coefficient is significant and positive, then there is positive feedback related to that or those lags; finally, if one or more than one coefficient is negative and significant, negative feedback regarding with that coefficient's lag may be stated. Warther (1995), Clark & Berko (1996) utilized an alternative second approach where a month is divided into four weeks and a regression is utilized to show the relation between foreign funds and returns; significance of the coefficients of weeks is believed to reflect any feedback trading in the market which is explained briefly in the methodology part of this thesis. A reservation by Clark & Berko (1996) is stated who discussed in their article that net inflow data is usually monthly in emerging countries; in that case, they questioned the power of these kinds of tests

that use monthly data in the regression analysis when foreign funds' feedback horizon is lower than the frequency used to run the regression. They have used monthly NFPI as endogenous variable and weekly returns as exogenous variables. Feedback hypothesis has been studied for institutions, small investors, pension funds etc. but majority of foreign trades belongs to institutions therefore related literature is presented here below.

Institutional Trades

There is substantial research on the effects of institutional trading[2] in the literature and those studies investigate whether institutional trades are trend chasing or engage in herding; this thesis focuses on the positive feedback aspect of institutional trades therefore, herding behavior of foreigners is undermined in this study as it is beyond the boundaries of this thesis. It may be helpful to reintroduce the market concept of feedback trading which is the flow driven by market returns.

Griffin, Harris & Topaloglu (2003) have classified trades as block trades, 10,000 shares and over and small trades as less than 500 shares. They show evidence that % 86 of block trades belong to institutional trades whereas, only 18 % of small trades belong to institutional trades. Authors studied the daily and intra daily effects of institutional trades for NASDAQ 100 securities over the period from May 2000 to March 2001 and they find a strong contemporaneous relation between stock returns and changes in institutional ownership. Griffin et al, conclude that institutional trading follows past stock returns. Positive feedback trading is also found to be present when a VAR analysis is used with intraday data of five minute intervals for institutional trades but interestingly individual trades and past returns have an inverse relationship. Choe, Kho & Stulz (1999) have found evidence of positive feedback trading of institutions in Korean Market and they have shown evidence that individual trades are contrarian. Choe et al, discuss the destabilizing effect of positive feedback trading and herding on prices and they give two reasons why they might not necessarily be detrimental; the first reason may be that investors trading on fundamentals may be stronger and they may be an obstacle against the movement of prices from the fundamentals and secondly, the information provided to positive feedback traders may be based on fundamentals and they may be moving the prices towards the fundamentals.

Keim & Madhavan (1997) have studied the impact of institutional trades on particular stocks and they reached to the conclusion that institutional trading has both permanent and temporary daily price effects. Jones & Lipson (2001) have studied the effects of the reduction in the tick sizes on the cost of institutions' and

[2] Even though, Foreign trades and Institutional trades are not exactly the same, it is worth to mention the effects of institutional trades from the aspect of understanding the structure of foreign investors.

individuals' trades in NYSE and they provide evidence that reduction in tick sizes increases the cost of institutions' trades whereas, reducing the cost of individual trades. Intuitively, if there is a high correlation between foreign trades and institution trades, then reducing the tick sizes may be an efficient and effective way of penalizing foreign investors. The samples and data used in these studies mostly from US markets which are assumed weak form of efficient. It will be fair to assume the existence of at least the same price effects of institutional trading on individual stocks in ISE whose depth is almost incomparable with the indices in US market.

If there is a meaningful correlation between institutional trades and abnormal returns in the prices of stocks or market values, those trades may be of interest for various parties due to regulation, arbitrage and manipulation purposes. This thesis' focus is on the temporary effect of institutional trades on the individual level.

Edelen & Warner (2001), studied the same relation however, they focused on the aggregate level rather than individual stocks. In their study they state that 50 % of all equities belong to institutional investors which make it reasonable to assume a significant effect on market returns by those trades. A strong and causal relation between aggregate fund flow and daily market returns has been studied in the literature and a substantial cross-correlation in fund flows has been presented in earlier studies.

Edelen & Warner (2001) found a positive relation between aggregate daily flow and concurrent market returns of 25(-25) basis points. Authors examined the lagged effects of return-flow relations and conclude that flow responds to returns, or to the information released that affects returns with a one day lag. They used a data from a private source (Trim Tabs (TT) Financial services of Santa Rosa, California that reports net flow on a daily basis for a sample of 424 US equity funds[3].

Froot, O'Connell, & Seasholes (2001) examined international portfolio flows into and out of 44 countries between the periods of 1994-1998. Among their interesting findings, some of them are of crucial importance for this thesis; First, they show evidence that flows are strongly influenced by past returns, which indicates positive feedback trading by institutional investors. Second, inflows have positive forecasting power for future equity returns and this power is statistically significant in markets like ISE (emerging markets). Third, the sensitivity of local stock prices to foreign inflows is positive and large. Fourth, temporary inflows affect future returns negatively.

[3] For ISE an internet site, Bigpara, announces the daily percentages of foreign participation in ISE and daily changes in the daily percentages may be used as inflows of foreigners when they are positive and outflows when they are negative.

Investors and policy makers are eager to find the answer to the questions of whether the flows affect the asset returns or not and whether the emerging markets are vulnerable to international portfolio flows or not. The stronger belief is that foreign outflows create crisis due to price overreaction and this view is supported by numerous academic studies including Brennan & Cao (1997)[4] and Bohn & Tesar (1996)[5]. They show evidence that there is positive correlation between returns and inflows.

Bange (2000) have studied the small investors in S&P 500 and provides evidence that small investors engage in positive feedback trading with the hope that past returns will repeat in the near future and this contradicts with the results of Shefrin & Statman (1985) and Odean (1998) who find negative feedback trading patterns of small investors.

1.4. Omitted Variables Hypothesis

This hypothesis is the most unpopular or neglected one among the hypotheses used in this thesis in the literature. This hypothesis states that there may be a significant correlation between inflows and security prices however; this correlation may be partly due to additional factors that may also explain the change in the dependent variable, market return. These additional factors may increase R-square of the tests that study how inflows and market returns affect each other (base broadening tests which neglect to incorporate these additional factors) but decrease the sole effect of these trades on returns and may show that base broadening hypothesis' test results may overestimate the affect of foreign funds on market returns. however, when these additional variables are appropriately incorporated to the equations, On one hand, it can be claimed that foreign inflows, after controlling for these added (omitted) variables, have significant effects on prices or on the other hand, it can be concluded that these additional variables do not increase the R-square at all and they have no significant effect on prices. Thus, prices increase solely due to risk sharing or improved liquidity as base broadening hypothesis predicts. The latter is highly unlikely for two main reasons; statistically, when an independent variable is added, usually R square increases even when there is spurious correlation between the independent and dependent variable; secondly,

[4] Brennan & Cao (1997) have examined the effects of US based purchases on 16 emerging markets and they show evidence that these purchases are positively related with concurrent returns in the local (emerging) markets but they couldn't find a significant evidence that foreign purchases are affected by returns of host countries.

[5] Bohn & Tesar (1996) express that their results indicate the intuitive fact that investors target the markets where expected returns are high and refrain from markets where expected returns are lower for the period 1980-1994. However, return chasing strategy of investors underperformed a buy and hold strategy of a market weighted portfolio of foreign equities by 15 basis points.

usually the added variables are an outcome of an educated guess of an academician and correlation between the added variable and dependent variable usually decreases the effect of foreign trades in the security prices. Clearly, these omitted variables may have effects on prices and the aim of the Omitted Variables Hypothesis is to increase the robustness of the regression once they are taken into account. In other words, the change in dependent variable may be better explained when these missing variables are incorporated to the regression equation. The challenge here is the determination of relevant variables added to the equation.

Clark & Berko (1996; Table 9 in Appendices) have used returns of Morgan Stanley world price index, S&P 500, Mexican Bills, dollar – peso exchange rate, stock price volatility and percent growth in aggregate earnings forecasts as omitted variables. Their omitted variables explain Bolsa returns significantly and when their additional factors are incorporated, the impact of foreign inflows on prices has reduced. The coefficient of foreign inflows have been reduced by 40 % after the inclusion of neglected variables but remained significant even at 1 % significance level. (Clark & Berko, 1996). Ornelas & Adabag (2005) have used returns of DJ EURO STOXX $, S&P 500 composite, JPM EMBI Global TURKEY and annualized daily volatility of ISE All Shares Index as omitted variables. Additional variables have improved adjusted R square from below 20 % to over 30 % and net foreign portfolio investments were still significant but at only 10 % significance level.

Henry (2000) have studied the relation between stock markets and private investment in 11 emerging markets, excluding Turkey. A strong positive correlation is found to be present the growth rate of private investment and changes in stock market valuation which is in line with base broadening hypothesis but for robustness purposes, omitted variables of world business cycle effects, contemporaneous economic reforms, and aggregate demand conditions are added to differentiate the private investment effect. He argues that there may still be some over estimation of the private investment effect due to possible neglected variables' effects such as judicial reform or public sector accountability changes. There will always be some neglected variables whose effects are not captured by the regression therefore it has to be known that over estimation is almost inevitable in that sense. Omitted Variables Hypothesis helps us in reducing this over estimation.

Richards (2005) have studied the impact of foreign trading in 6 Asian, emerging markets. He states that rather than using the same omitted variables for each market under study, for each market, a unique VAR analysis has to be made. For instance, for the two Korean markets under study, Philadelphia Semi-conductor Index is found to be the most relevant and significant return series and included as the U.S. Index; whereas, S&P 500 is included for Thai, Philippines, and Indonesian

markets. This flexibility in substituting omitted variables is both logical and effective because foreign investors may chase ISE returns but they may also chase the returns of relevant market returns which ISE may be a substitute for those markets.

1.5. Foreign Trading

There are comparatively scarce studies regarding with international flows. Froot et al, (2001) argues that the main limitation facing these studies is the low frequency of previously available data. Few researchers covered topics related to international flows party due to this limitation.

Some of the studies are interested in whether institutional investors trade in herds or not. Chen (2002) defines herding in the stock market as a "group of investors' trading in the same direction over a period of time". Wermers (1999) studied herding behavior of institutional investors in US stock markets. He provides evidence that stocks that have experienced extreme returns in the prior quarter have remarkably greater herding; noise traders chasing winners and sell-side herding occurring with the stocks experiencing extreme negative returns. Interestingly, stocks that are bought in herds have a higher return than stocks sold in herds. It can be inferred that it is harder to time the market when selling as selling in herds is not as effective as buying in herds. They find evidence of positive feedback trading strategies based on observed herding by growth oriented mutual funds.

The question regarding with foreigner's trading behavior is whether they have a stabilizing or destabilizing effect on markets they deal with has been studied in the literature as well, there are two main approaches; destabilizing effect due to excess volatility arising from foreigner's trading (De Long et al., 1990), the opposing approach argues that when foreigners invest in a market they share the risks with local investors; they bring liquidity and consequently decrease the cost of equity which leads to permanent increase in stock prices; in other words, base broadens. (Stulz, 1999; Bekaert & Harvey, 2000).

In the literature foreigner's capital outflows were accused of being the reason for destabilization of the markets because local investors are not able to meet the supply the mass sell orders from the investors and prices fall drastically and causing instability. This is a reasonable concern when there is a safe haven available for funds to repatriate or arrive in risky times; however, when the return potential is expected to be very low in developed markets by foreign funds, they may elect to increase their dominance in an emerging market and cause permanent increase in prices which may destabilize the market as well. If foreign investors increase their shares to sufficient levels, they may earn the ability to destabilize the markets they involve in. This does not necessarily have to be via capital outflows, destabilization could also be realized by maintaining the prices when they are

expected to fall or by overpricing the stocks and creating a market for those stocks at the higher price levels.

Adabag & Ornelas (2006) have studied the effects of foreign fund on the ISE for the years 1997-2004. They used a VAR model to indicate the relation between foreign portfolio inflows and US dollar returns of ISE. They have found instantaneous causality between returns net foreign portfolio inflows and they state that even though there may be base broadening for short term, base broadening for the long term can not be verified as the base have not been broadened during the period they have studied. They found weak evidences of negative feedback trading of foreign funds. They found no price pressure effect and they have concluded that foreign funds cannot be blamed for instability, on the contrary, with the nature of contrarian strategy of foreign fund managers; they conclude that foreign funds help the market to smoothen in terms of prices.

Baklaci (2009) has studied the interaction between foreign investor's trades and the return of IMKB 100. He studied the relation between the foreign purchases and ISE returns with a monthly sample of 132 from the period between 1997 and 2007. He had a sample of 20 stocks from ISE, 14 of which belongs to ISE 30 index. Baklaci (2009) has used ISE-100 values, number of shares that belong to foreigner's, and market capitalization of these shares as three different variables when assessing market analysis of the period 1 December 2005 and 11 March 2008 with a sample of 593 samples. The data is obtained from MKK as well.

Baklaci (2009) has tested the presence of causality with a VAR model with two variants; one with number of stocks and one with market capitalization values. He shows evidence that causality is present in majority of stocks at 10 % significance level when number of stocks variant is used. Under this variant, half of the stocks in the sample supports positive feedback hypothesis and the other half supports negative feedback hypothesis Baklaci claims that the outcome supports the hypothesis that foreign investors pursue an active strategy of asset management and frequently modify their positions. He also mentions about the presence of a stronger price pressure effect for majority of stocks. He also shows evidence that prior purchases of foreigners have a positive effect on current returns. For the second variant, Baklaci uses a VAR model with lags and shows that there is a significant relation between ISE 100 return and market capitalization of the stocks held for foreign investors. He also finds that the effect of foreign transactions on returns is smaller than the effect of past returns on foreign purchases and finds that the effect of an increase in the number of stocks has a positive effect on index returns this is also true for lagged values. Baklaci (2009) finds a stronger feedback effect than price pressure effect when number of stocks is taken into account whereas, when market values are the case, then price pressure effect dominates the

feedback effect; the author relates this outcome to the fact that 70 % of the transactions are realized by foreigners.

1.6. Liquidity and Stock Returns

Prior studies have investigated the effects of idiosyncratic liquidity and systematic liquidity on prices mostly in developed countries including US markets, Japanese Markets and European Markets. And especially in the last decade, some have studied emerging markets as well. This thesis aims to focus on the argument that price increases permanently in a market when foreign funds arrive due to increased liquidity

Pastor & Stambaugh (2003) have studied a period of 34 years and state that high liquidity sensitive stocks have 7.5% excess return compared to stocks with low sensitivity to liquidity. Other factors such as market return, size, value and momentum factors were adjusted. Llorante, Michaely, Saar & Wang (2001) provide empirical evidence indicating that asymmetric information may weaken the volume related reversal effect and even produce volume related continuations in stock returns. Lee & Swaminathan (2000), show that momentum effects in monthly returns are higher for the securities with higher recent volume which may provide basis for feedback hypothesis. They also show evidence that initial loser portfolios that they have generated have underperformed their initial winner portfolios significantly.

Amihud & Mendelson (1986), studied market microstructure and asset pricing indicating the fact that only investors who can afford to work with longer maturities can hold illiquid securities. Due to this fact, they argued that the observed asset returns must be an increasing and concave function of the transaction costs. They used the quoted bid-ask spread as a measure of liquidity and studied the relationship between stock returns and liquidity in the period of 1961-1980 and they have found evidence regarding with the existence of liquidity premium.

Amihud (2002) also studied the stock return vs. illiquidity relationship over time. His main proposition was that the ex ante stock return is increasing in the expected illiquidity of the stock market. His illiquidity measure, ILLIQ, is the daily ratio of absolute return to its dollar volume, averaged over some period which is the price response of the stock to the one dollar of trading volume.

The author admits that this measure is not complete in explaining the effects of illiquidity and even though he is well aware of better alternative measures such as, bid-ask spread, market impact(transaction by transaction) which is the relation between the price change and the trading volume or the order flow, or the probability of information based trading, he elects this incomplete measure because it is easy to obtain and defends his decision by stating that other measures require a lot of micro structure data which lack in many stocks and even for the stocks that

have sufficient data, they don't cover long periods to test the effects of illiquidity in the mean time on stock excess returns.

Eleswarapu & Reinganum (1993) used the same proxy for liquidity and the same period. They find that only on month January, there is a significant association in liquidity (bid-ask spread) and stock prices. Brennan & Subrahmanyam (1996) however, divided transaction cost into variable and fixed parts. Contradicting with the Eleswarapu and Reinganum, they found no evidence regarding with the seasonality in liquidity premium.

Datar, Narayan, & Radcliffe (1998), used a different proxy for liquidity, turnover rate, which is mainly the number of shares traded divided by the number of shares outstanding. Authors mentioned two advantages of using turnover rate as a proxy for liquidity; liquidity cannot be observed directly but turnover rate can and it is relatively easy to obtain data on turnover rate. They found that the stock returns are a decreasing function of the turnover rates. Their study also examined the relation by controlling for the firm size, book to market ratio and the firm beta. They find that the turnover rate is significantly negatively related to stock returns meaning that illiquid stocks offer higher average returns.

In order to determine the effect of firm size, book to market, and firm beta, they used both uni-variate and multi-variate regressions and noticed that the slope coefficient of size is negative and significant (-0.06, t-stat. -6.17) while that on book to market is positive and significant (0.22, t-stat. 9.53) which are conforming to previous researches however, firm beta has a significant negative coefficient (-0.49, t-stat. -8.84). (Datar et al, 1998),

The authors tried to substantiate the magnitude of illiquidity by subtracting the turnover rate of an illiquid stock from the 10^{th} percentile from that of a liquid stock from the 90^{th} percentile and marked the difference to be around 6 %. When this 6% is multiplied by their slope coefficient of 4.5 basis points per month, they reach to the conclusion that illiquid stocks earned a higher return of 27 basis points per month or approximately 3.25 % per annum as compared to liquid stocks. They find that 1 % drop in the turnover rate, on average, results in a higher return of 4.5 % basis points per month. (Datar et al, 1998),

Pastor & Stambaugh (2003) focused on a dimension associated with temporary changes accompanying order flow. They constructed a measure of market liquidity in a given month as the equally weighted average of the liquidity measures of stocks on the AMEX and NYSE, using daily data within the month. Their liquidity measure is the ordinary least squares estimate of γ_{it} in the regression.

$$r^{e}_{i,d+1,t} = \theta_{i,t} + \varnothing_{i,t}\, r_{i,d,t} + \gamma_{i,t}\ \text{sign}\,(r^{e}_{i,d,t}).v_{i,d,t} + \epsilon_{1,d+1,t}, \quad d = 1,\ldots,D,$$

Where quantities are defined as follows:

$r_{i,d,t}$: the return on stock I on day d in month t,

$r^{e}_{i,d,t}$: $r_{i,d,t}$ - $r_{m,d,t}$, where $r_{m,d,t}$ is the value-weighted market return on day d in month d,

$v_{i,d,t}$: the dollar volume for stock I on day d in month t.

They have chosen to compute a stock's liquidity in a given month only if there were more than 15 observations. They have excluded a stock's first and last partial month. Each observation had to have data for two successive days.

This regression helped them remove market wide shocks and better isolate the idiosyncratic stock effect of volume related return reversals by using a return in excess of the market both as the explained variable and to sign volume. When the stock price doesn't change but the market goes down, it is fair to assume the stock's order flow on that particular day as more dominated by buyers. They have also included a lagged stock return as a second independent variable to capture lagged return effects that are not volume related such as reversals may occur due to minimum tick size[6].

They have also used a simple model for the stock return which is as follows:

$r_{i,d} = f_d + u_{i,d} + ø_i (q_{i,d-1} - q_{i,d}) + n_{i,d} - n_{i,d-1}$

f_d is a market wide factor and $u_{i,d}$ is a stock specific factor. They reflect permanent changes in the price of the security. They have incorporated the term $ø_i (q_{i,d-1} - q_{i,d})$ to capture the liquidity related effect arising from order flow, $q_{i,d}$.. Here, we notice that lagged order flow also enter the return calculation.

The coefficient $ø_i$ represents the stock's liquidity and the term $n_{i,d} - n_{i,d-1}$ represents an additional reversal effect that is independent of the order flow effect which can be seen as bid-ask bounce or a tick size effect. They found the cross sectional correlation between $ø_i$ and γ_i is 0.98 suggesting the first regression is reasonable to estimate the liquidity effect.

Chuhan (1994), stated that foreign institutional investors refrain from investing in emerging markets due to poor liquidity. Emerging markets become the focus of attention when institutional investors increase their interest in this relatively higher risk, higher return countries. Emerging markets have comparatively less number of securities and their ownership structure is not well diversified. Most of the investors are investing short term which increases the liquidity premium and Bekaert, Harvey, & Lundblad (2006), studied 19 emerging markets where liquidity effect may be stronger. They use liquidity measures predicated on the incidence of observed zero daily returns in these markets.

[6] For instance, investors may deliberately increase the price of the stock by purchasing only one share of a stock. In Turkey, investors are entitled to credit up to 35 % of their overall portfolio. In order to maintain the margin, investors who purchase securities on credit, have a tendency to affect the closing price of a stock upwards in order to avoid forced sales

This measure requires only a time series of daily equity returns which is obviously an advantage of this measure. When data on bid-ask spreads is insufficient, this measure is a promising alternative. Their second measure for liquidity attempts to capture the "catch up" effect into account. When a security doesn't trade for a period of time, there should be a price pressure due to the illiquidity of that security. They denote the price pressure as PP and formulate it as follows:

$$PP_{i,t} = \sum_{j=1}^{N} \quad w_j \, \delta_{j,t} \, I \, r_{j,t,r} \, I \, / = \sum_{j=1}^{N} \quad w_j \, I \, r_{j,t,r} \, I$$

Using N stocks in country I, indexed by j; where w_j represents the weighting of the stocks in the index. No trade days are shown as:

$$\delta_{j,t} = \{if \; rj, t \; or \; rj, t-1 = 0 \mid 0, otherwise\}$$

$$r_{j,t,r} = \{rj, t, \quad if \; rj, t-1 \neq 0 \mid \prod_{k=0}^{\tau-1}(1 + ri, t-k) - 1, \quad if \; rj, t-1 = 0$$

Where τ represents the days the security has not been traded and $r_{j,t,r}$ is an estimate of return that would have occurred if the stock had traded.

They find that the proportion of daily zero returns measure is correlated, 48% on average, with the mean bid-ask spread across all 19 countries and time periods. Bekaert et al (2006), show evidence that their measure picks up bid-ask spread, a constituent of liquidity and transaction costs whereas, the turnover measure is incapable of doing that. When they investigate liquidity pricing during shocks, they find a strong significantly positive correlation between liquidity and return shocks however, the effect is weaker for East Asian and Latin countries.

They also show evidence that countries with lower transaction costs on average shows a weaker predictability effect and weaker shock correlation. They find that local systematic liquidity risk is more important than local market risk. If a country has higher political risk and/or poor legal conditions then, liquidity affects the returns even more strongly.

Martinez, Nieto, Rubio, & Tapia (2005) proposed a new market wide liquidity factor which is the difference between the returns of stocks that are highly sensitive to changes in relative bid-ask spread and stocks with low sensitivity to changes as such. They argue that when there is a positive covariance between the returns of these stocks and this above mentioned factor, than these stock's returns may go down for the periods when the liquidity is low therefore, investors will ask premium to hold these assets.

Measures of Liquidity

There are different methods used to measure aggregate stock market liquidity; Chordia, Roll, & Subrahmanyam (2002) have liquidity measures including, quoted share and dollar depth, quoted absolute and proportional spreads, and effective absolute and proportional spreads. They formed daily time series of measures of liquidity and trading activity such as volume, averaged across NYSE stocks for a

decade starting from 1998. Amihud (2002) forms an annual aggregate liquidity series by averaging across NYSE stocks the ratios of average absolute price change to trading volume in between the years 1963 and 1997.

Jones (2002) has an annual time series of average quoted bid-ask spreads on the stocks in the Dow Jones index for the period of 1900 through 2000 and the existence of a gradual decline in the spread is documented. Lo & Wang (2000) form a weekly series of average turnover across NYSE and AMEX stocks from July 1962 to December 1996. Eleswarapu & Reinganum (1993) average the beginning and of year relative bid-ask spreads of a stock in the previous year and assign that value as the spread for that security for that year.

Bekaert et al (2006), uses equally-weighted zero returns, equally weighted price pressure, value weighted price pressure, and turnover in their study. The rationale behind zero returns can be explained as the increase in the number of zero returns can be related to a decrease in liquidity. To be more specific, four different liquidity measure may be of our concern and they are described briefly as follows;

Amihud's illiquidity measure, ILLIQ, is the daily ratio of absolute return to its dollar volume, averaged over some period which is the price response of the stock to the one dollar of trading volume.

Chalmers & Kadlec (1998) decided to obtain their liquidity measure, the amortized effective spread, from quotes and the following transactions. The effective spread is the absolute difference between the mid-point of the quoted bid ask spread and the subsequent transaction price, and then the transaction is categorized as a buy or sell transaction. By using the turnover rate on stock, the spread is divided by the stock's holding period in order to obtain the amortized spread.

Brennen & Subrahmanyam (1996) use a liquidity measure in which the orders are classified as buy or sell orders depending on the proximity of the transaction price to the previous bid and ask quotes and the liquidity measure is the slope coefficient of the regression of transaction by transaction of price movements on the signed order size.

Easley, Hvidkjaer, & O'Hara (2002) used a new measure of microstructure risk which is the probability of information based trading (they named it PIN). It is estimated from intra daily transaction data and it is assumed to subsume the negative selection cost resulting from the asymmetric information among investors. They show evidence that their measure has a large positive and significant effect on stock returns. They show evidence that a 2.5 % extra return may be expected when there is a 10 percent difference between two stock's PIN.

1.7. Commonality and Systematic Liquidity

Martinez et al, (2005) claim that instead of regressing common stock returns on individual characteristics of liquidity, like the relative bid-ask spread, adverse selection, depth, or probability of information-based trading, they should be regressed on a proxy for a liquidity factor reflecting aggregate liquidity restrictions.

They regressed the monthly percentage change in the relative bid-ask spread for each of the 204 firms available in their sample, DSP_{jt}, on a cross sectional, equally weighted average of the same variable representing the market wide relative spread, $DSP_{mt,}$ and show evidence that there is commonality in liquidity in the Spanish stock market. DSP_{jt} is as follows;

$$DSP_{jt} = \alpha_j + \beta_j DSP_{mt} + \varepsilon_{jt.}$$

The average sensitivity of changes in the bid-ask spread relative to changes in the aggregate measure of liquidity is found to be 0.88 and significant, indicating that idiosyncratic liquidity commoves with market liquidity and commonality in liquidity exists in the market.

Some studies address the existing commonalities in liquidity in an international context and will aim to determine the factors affecting the similarities. There can be country specific factors, industry specific factors, and/ or a global factor.

Stahel (2005) has used a sample containing daily observations from 1980 to 2001 for the stocks listed in US, UK and Japan. For every individual asset, several monthly measures have been calculated based on daily data and by totaling them, country, industry or global measures have been generated. He makes inferences regarding with the existence of independent country and worldwide commonalities in liquidity.

The relation among the individual assets have been searched in the studies of Chordia, Roll, & Subrahmanyam (2000), Hasbrouck & Seppi (2001), and Huberman & Halka (2001). They questioned whether and to what extent common factors in liquidity affect asset prices.

Chordia, Roll, & Subrahmanyam (2000), have documented commonality in liquidity for the first time in the literature, they claim that the existence of commonality in liquidity proves that individual stock liquidity is affected by asymmetric information and inventory risks.

Hasbrouck & Seppi (2001) analyze commonalities in order flows and returns for the 30 stocks in the Dow Jones Index using high-frequency data for 1994. They find one to two common factors in order flows and show that these factors explain approximately two-thirds of the commonality in returns. What they have also found is the evidence that idiosyncratic liquidity strongly dominates the common liquidity factor in explaining returns. These may indicate that rather than being a risk factor that is being priced, it may be an asset specific characteristic that is priced.

Huberman & Halka (2001) have analyzed the difference in cross-sectional averages of daily liquidity measures. They have intraday data from NYSE stocks for 1996. Their study indicates that time series model innovations in average liquidity are correlated and they see this as a proof of a common liquidity factor. Chiru S. Fernando (2003) examined the causes and outcomes of commonality in liquidity using a model of liquidity trading in which liquidity shocks are divided into common (systematic) and idiosyncratic categories. It is shown that common liquidity shocks don't increase commonality in trading volume which is independent of systematic liquidity risk that is always priced irrespective of market liquidity.

There are several liquidity measures in the literature; Kyle's Lambda (the response of price to order flow), the bid ask spread, the effective spread or the market depth. All of them can be used to search the cross sectional and time series determinants of liquidity over short term. For Longer Terms, Gibson & Mougeot (2004) used market liquidity as number of traded shares in the S&P 500 Index during a month.

There are two other proxies for systematic liquidity which are not commonly in use due to the lack of data availability and fear of multicollinearity. These measures are the dollar volume of shares traded and excess market return divided by total number of shares traded during the month.

Chordia, Sarkar, & Subrahmanyam (2005) have investigated the relations between liquidity measure for stocks and liquidity in the treasury notes market. They had intra-day data from 1991 to 1998 from NYSE. Liquidity commonalities resemble each other and factors driving liquidity are named monetary conditions and mutual fund flows. Acharya & Pedersen (2003) investigate asset returns net of stochastic liquidity cost in an overlapping generations model. Their results imply that the cross-section of expected returns depends not only on the asset's sensitivity to the market return but also on individual and market liquidity and the two co variances between these three factors.

In particular, the model implies that assets which have depressed values when overall market liquidity is low need in equilibrium to compensate investors for holding these assets. Moreover, their model implies that market liquidity commands a positive risk premium.

1.8. Liquidity Risk Factors

Liquidity risk factors are tried to be substantiated in the literature; three of them are explained briefly in this section. It may be important to differentiate the liquidity risk factor among other factors in order to better understand the relation between foreign fund flows, security prices and liquidity prices. Price pressure may be substantiated from these factors but that is beyond the scope of this thesis.

1.8.1. The Pastor and Stambaugh Factor (P&S)

Aggregate liquidity factor introduced to the literature by Pastor and Stambaugh, (P&S), is obtained by the equally weighted average of the liquidity measures of stocks, which are calculated with daily return and volume data within that particular month. OLS regression can be performed with daily data when the stock has at least 15 days of trading day.

$r^{e}_{i,d+1,t} = a_{i,t} + b_{j,t}\, r_{j,d,t} + \lambda_{j,t}\ \text{sign}(r^{e}_{j,d,t}).\text{vol}_{j,d,t} + u_{,j,d+1,t}$,

Where, $r^{e}_{i,d+1,t}$ is the return on stock j on day d+1 (in month t) minus the market return on the same day, $r_{j,d,t}$ is the return on stock j on day d, and $\text{vol}_{j,d,t}$ is the YTL volume for stock j on day d in month t. the most important coefficient is the sensitivity of the percentage price change of stock j on day t+1 to the order flow on t, generated as the volume signed by the returns on the stock minus the return on the market. The logic behind the model is that in order to determine whether a stock market is liquid or not, its ability to absorb large amounts of trading without substantial price changes can be investigated.

Order flow which is the signed volume in the regression mentioned above, can imply a return that is expected to be reversed in the future when the stock lacks liquidity. Thus, $\lambda_{j,t}$ is expected to be negative and bigger in absolute value when liquidity dries out so the greater the order flow, the greater the expected return on that particular security. To determine the sensitivities to market-wide liquidity, an aggregation should be done to obtain $_{t} = 1/\text{Nt}\ \sum_{j=1}^{Nt} \widehat{\lambda}\, j,t$, and differences are taken.

$\Delta_{t} = \frac{mt}{m1}\, 1/N_{t}\ \sum_{j=1}^{Nt} (\lambda_{j,t} - \lambda_{j,t-1})$

Where m_{t} is the total dollar value at the end of month t of the stocks included in the market, month 1 corresponds to January1993, and N_{t} is the number of available stocks in month t. the liquidity factor is given by the residuals:

$\Delta_{t} = c + d\Delta_{t-1} + e(m_{t-1}/m_{1})\,\Delta_{t-1} + \varepsilon_{t}$

The final systematic liquidity factor is derived from the fitted residual of the above mentioned equation. The factor may be too low therefore it may be scaled by 10^{8} or 10^{9}, depending on the outcomes, in order to get more comfortable quantities of market-wide factor.

P&S = $_{t}$ * scale factor

1.8.2. Illiquidity Factor

This measure captures the price effect as the response related with one dollar of trading volume. In his study, Amihud (2002) determined the illiquidity of a particular stock as the ratio of absolute price change per dollar of daily trading volume. To be more specific, the illiquidity of stock j in month t is as follows;

$ILLIQ_{jt} = 1/D_{jt}\sum_{d=1}^{Djt} \frac{IRjdtI}{Vjdt}$

R_{jdt} represents the return on day d in month t and V_{jdt} represents euro volume on day d in month t; D_{jt} is the number of days that the stock j has traded in month t. When the ILLIQ value is high, it means that the price fluctuate more than it should have, compared to the trading volume therefore, the stock may be considered as illiquid. In order to get the market wide liquidity factor, this measure should be added across stocks as follows;

$ILLIQ_t = 1/N_t \sum_{j=1}^{Nt} ILLIQjt$

An increase in this measure indicates an adverse shock to overall liquidity level in the market. Stocks that have lower returns during liquidity shocks don't protect investors therefore; an extra compensation is required for them to hold these assets.

1.8.3. The bid-ask Spread Return Factor (HLS)

The logic behind this factor is to measure the difference between returns on assets very sensitive to changes in the relative bid-ask spread and returns on assets with low sensitivity to the change in the relative bid-ask spread. Each security's sensitivity to changes in relative spread is calculated as follows;

$R_{jt} = a_j + b_j DSP_{jt} + u_{jt}$.

All the securities in the sample are categorized into three groups; low, medium, high sensitive to changes in the relative spread. They are ranked and the rankings will be updated every month according to their sensitivities over the previous 60 months in the sample. Martinez et al (2005) used a period of 36 months but using longer term such as 72 months may better capture the seasonality effect. For each category, each month equally weighted portfolios are formed using the securities that belong to each category so that three equally weighted, different portfolios are generated, HS, MS, LS, between January 1993 and December 2007.

Assets that are categorized as low sensitive (LS) to changes in the bid-ask spread, are the ones whose returns diminish relatively little when the change in the bid-ask spread increases whereas, highly sensitive stocks (HS) tend to have returns that diminish by a relatively large amount when the spread increases. HLS factor is obtained by subtracting the portfolio returns of low sensitive stocks (LS) from the returns of high sensitive stocks (HS). HLS factor must go down when there is an increase in the variation of the spread therefore; stocks with positive covariance between the HLS factor and their returns tend to lose value when market wide liquidity dries out. Investors who consider holding these assets ask extra premium as these assets don't hedge them from negative liquidity shocks.

1.9. Trade Imbalances

Trade imbalances can be defined as the difference between the orders. If sell orders are much more than buy orders than negative returns are expected or

positive returns are expected when buy orders dominate the market. It can be argued that extreme order balance can strongly affect the liquidity level and the prices. There may be major reasons under this intuition according to Chordia et al, (2002); the first reason may be due to private information which should reduce liquidity level temporarily if not permanent; could also move the prices permanently as assumed in the Base Broadening Hypothesis. The second reason may be that a large order imbalance triggers the inventory problem faced by the market maker' who can be driven to change bid-ask spreads and price quotations. Importance of order imbalances' influence on stock returns and liquidity may dominate the importance of influence of volume data due to these two reasons.

Trading volume data is widely used in liquidity studies as it is easy to obtain however, trade imbalances are not easy found and it is harder to determine if the trade is buyer initiated or seller initiated. Lee & Ready (1991), introduced an algorithm to assign such transactions which is pretty straight forward and easy to use. Briefly, the algorithm categorize a trade as a seller initiative if the transaction price is closer to the bid of the prevailing quote; if it is close to the ask price than it is assumed to be a buyer initiated prices.

For ISE data, tick sizes may be predetermined depending on the price level therefore, the trades are mostly either from the bid price or the ask price so it is easier to classify but for cases when the trade is exactly at the midpoint of the bid ask price, an algorithm may dictate a tick test which classifies the trade as seller initiated if the last price change prior to the trade is negative; if it is positive, then it may be assumed as buyer initiated.

Chordia et al (2002), explain the correlation between imbalances, liquidity and returns with the inventory paradigm rather than asymmetric information. Intuitively, they state that asymmetric information is unlikely for the aggregate market. This may be worth to study for future studies for emerging markets.

They measured liquidity by averaging each individual stock's quoted spreads over daily transactions and they value weight the average daily spreads across stocks. They regressed the daily percentage change in the market average quoted spread on four different controls to determine the incremental effect of order imbalance on liquidity above and beyond its association with trading and price moves. Those four controls are namely as follows;

1) A non-linear function of the contemporaneous daily change in the absolute orderimbalance between the number of buyer- and seller- initiated trades.
2) The simultaneous daily percentage change in the number of transactions
3) Concurrent return
4) Concurrent market volatility, measured by the absolute return on the S&P 500.

The second and fourth controls are aimed to account for aggregate trading activity and market movements. Results show that higher spreads occur when orders are more unbalanced in either direction. The effect is highly significant and nonlinear, with a t-statistic of approximately 12 and a curvature between cubic and quadratic; λ, which is the maximum likelihood estimate is found to be 3.19.

Chordia et al, (2002) show evidence that order imbalance cannot predict changes in liquidity but both the number of trades and the market return can predict changes in liquidity. Their results indicate that liquidity persistently parallel with previous market moves. When the market is down, higher spreads and lower liquidity is predicted the next day; when the market is up, lower spreads and higher liquidity is predicted the next day. The magnitude of the effect of an up market is much smaller than for a previous down market. The impact of excess sell orders is four times stronger than the effects of excess buy orders.

Variation in the number of transactions has a significant impact on spreads. This attracts attention because order imbalance was taken into account and several explanations have been tried to put forward including, measurement error in the order imbalance and the uneasiness of market makers to control their inventory when trading volume changes substantially and forcing them to widen their spreads as they are unable to place quotes on both sides of the market during periods of large imbalances. In short, their data show a robust correlation between changes in absolute level of market wide order imbalance and market wide liquidity and market returns can be used to predict changes in liquidity.

When Chordia et al, (2002) examine the relation between market returns and order balances, a signed measure is used resulting in the separation of the order balance into positive and negative aspects which allows for differential effect of excess buy and sell orders. If order imbalance, called OIBNUM in their study, has positive coefficients then it means that buy orders increase the price of the individual stocks or sell orders decrease the prices. It is worth to note that lagged order imbalance exerts significant negative effect on the current day's return even after taking the contemporaneous return into account.

When there is a bearish market, Foreign Investors don't usually place large orders to obtain the shares but usually medium sized orders are preferred because they don't want to be taken notice of as if something extraordinary is on the way or a new information is going to be released. Barcley & Warner (1993) consistent with their "stealth trading" hypothesis, show evidence that majority of the price change before a tender offer announcement is done via medium size trades. Investors may reap profits by supplying funds that eliminates all the resistances on prices or they can supply securities that cannot be absorbed by the market and lead to crashes in the particular share price.

Since investors cannot diversify away the systematic liquidity risk via trading, the risk of systematic liquidity shocks is almost always priced and the liquidity level in the market doesn't change this reality significantly. Pastor & Stambaugh (2003) confirm that systematic market liquidity is priced in the US stock market. Milgrom & Stokey (1982) state that systematic liquidity shocks will not trigger trading even if the market is liquid. However, the state of liquidity in the market is highly essential in idiosyncratic liquidity shocks.

It is essential to note that permanent increase in stock prices may be due to improved liquidity in the markets as above mentioned academicians argue or it may be due to risk sharing as base broadening hypothesis predicts but more likely, both effects occur at the same time and they both contribute to the permanent increases in stock prices but to determine which one is more dominant in ISE is beyond the scope of this study and is open for future research.

2. Factors Affecting Stock Prices and Related Theories

Numerous factors may affect stock prices, it is impossible to model the price changes with 100 % accuracy because factors and their significance vary from market to market and time to time and some factors may gain importance or loose

importance according to the prevailing conditions in a particular market but still some of them are addressed in this study with the relevant theories in the literature so that a clearer picture of factors impacting on stock prices may be presented which may help understanding the way foreign investors think when they invest; it is also aimed to identify some of the missing variables that are going to be used in explaining ISE returns in the Omitted Variables Hypothesis section. Some of the important factors affecting stock prices are presented here below:

2.1. Capital Structure

All the firms that issue stocks surely have assets but the way they finance the purchase of these assets are claimed to be influential on security prices. Some of the firms may finance it internally, without any bank loans, which results in lower default risk; some of the firms may elect to use external financing to benefit from the leverage effect and to better exploit the growth opportunities at the expense of higher default risk due to interest cost they are bearing. Theories regarding external funding and value of firms are presented here below.

2.1.1. Capital Structure Theory

In 1958, Professors Franco Modigliani and Merton Miller (M&M), introducing capital structure theory, show evidence that capital structure of a company doesn't affect the value of a firm with a very restrictive set of assumptions. They assume there are no taxes, brokerage costs, bankruptcy costs, investors and corporations borrow at the same rate, EBIT is not affected by the use of debt, and investors and managers have the same information about the future investment opportunities of the firm. In a no tax world, the value of a firm depends on the firm's asset base and it won't change no matter how the firm finances it. This means that the firm's WACC is constant as there are no taxes and the capital structure doesn't affect the stock price of the firm.

2.1.2. Tax Effect

M&M has studied the effects of taxes in another work of theirs. As interest payments are tax deductible whereas, dividends are not. M&M demonstrate that the optimal capital structure in a tax world will be 100% debt if their other assumptions hold.

2.1.3. Bankruptcy Costs Effect

M&M assumes a constant borrowing cost which is controversial in the sense that as debt ratio increases lenders ask more interest for the increasing bankruptcy risk. So in a M&M market with taxes and bankruptcy costs, the WACC will decrease in the beginning as debt ratio increases by small amounts than it will bottom out and finally when interest rates start to increase, WACC will start to increase as well. As a result, WACC is minimized and Stock price is maximized by having an optimal capital structure in a world with taxes and bankruptcy costs.

2.1.4. Trade off Theory

The trade-off theory of leverage states that the optimal capital structure is where the advantages of tax shelter of debts are equal to the costs, which is bankruptcy risk. This theory suggests a value maximizing debt level where the marginal costs of bankruptcy is equal to the marginal benefits of tax shelter. The end result from this theory is that capital structure can affect prices.

2.1.5. Signaling Theory

Symmetric information is among the assumptions of M&M. In real life, manager may have better information than investors, indicating asymmetric information. Signaling theory states that if a company willingly issues new shares it should mean that the firm's prospects are not exceptional. If they were exceptional, the management would know that their stock prices would increase due to their exceptional situation and they would avoid issuing new stocks when the prices are yet low. They would prefer debt alternatives to raise funds and management might than issue stocks when prices have increased.

2.2. Dividends

Dividends may or may not affect the stock price of a firm. Debate about the influence of dividends on stock prices has not reached to a conclusion. Black (1976) argues that fund managers prefer dividend paying stocks as it would be more prudent for them. A stock that promises both dividends and capital gains may be a more conservative investment than a stock that offers only capital gains. To have a better understanding, investor preferences for dividends are described in three theories which are mentioned briefly here below:

2.2.1. The Dividend Irrelevance Theory

M&M states that dividend policy has no effect on the company's stock price or its cost of capital. It is argued that an investor may elect to tailor the dividend policy according to her needs. If the dividends are too much, stocks are purchased; if they are too little, stocks may be sold and cash, which can be seen as dividends, may be generated. This theory holds when there are no taxes, brokerage costs, and infinitely divisible shares.

2.2.2. The Bird-in-the-Hand-Theory

Gordon (1959) and Lintner (1956) state that investors evaluate expected dividends more highly than expected capital gains because growth component in the total expected return equation is more risky than the dividend yield component.

Expected return equation: $k_s = D1/P0 + g$.

Where;

Ks = expected return

D1 = next period's dividend

P0 = current price of the stock

g = growth rate

2.2.3. The Tax Preference Theory

This theory mentions three reasons why investors might prefer the stocks that pay lower dividends:

1) Capital gains are taxed at a lower rate than dividend income in almost all of the markets.

2) Capital gains taxes are not paid until they are realized.

3) No capital gains taxes are due upon the death of an investor holding stocks.

For a statistical test to be valid; things other than dividend policy must be held constant and each firm's cost of equity must be measured with a high degree of accuracy. Therefore, it is hardly possible to set a clear relationship between the dividend policy and stock prices.

2.2.4. Clientele Effect

Another issue regarding with dividend policy is the clientele effect referring to the different groups of investors, such as corporations, small investors and institutions that buy stock. The dividend clientele effect states that low tax bracket investors, like the foreign investors in Turkey and corporations, prefer high dividend payouts; high tax bracket individuals may prefer low dividend payouts in this regard.

Our sample period is assumed to be suitable for the dividend irrelevance theory as capital gains are not taxed in ISE for foreign investors and tax preference theory doesn't mean much. Despite the sound reasoning behind bird-in-the-hand theory, the effect of preference of dividends over future capital gains will be immaterial in our study.

2.3. Psychological Factors

Modern Portfolio Theory (MPT) assumes that investors make rational buy and sell decisions. Rational investors are risk averse in the sense that they require higher returns in order to compensate the higher risk taken. MPT also assumes that investors are assumed to assess risk and return of the assets within a portfolio context.

Investors are assumed to form portfolios that maximize expected return within risk class and minimize risk within expected return class. A portfolio is assumed to be efficient when it fulfills the above mentioned conditions and the theoretical set of all available efficient portfolios is called the efficient frontier. When we combine the portfolios on the efficient frontier with a risk free asset, we derive Capital Market Line (CML) where we notice that investors hold some combination of risk free security and the market portfolio. Investors are assumed rational to invest wisely to these portfolios and they are assumed to make no unsystematic errors.

The limitation of these assumptions is that, in reality, people do mistakes, and behave irrationally. Investor's mood may lead them to be risk seeking rather than being risk averse. Behavioral tendencies may influence the investors to make decisions on case by case basis rather than a portfolio context. Thus, behavioral tendencies may affect the buy and sell decisions and they may affect the prices of securities. The possible psychological errors that can be done by investors are briefly defined, listed, and their effects on prices and reversals are discussed here below.

1) Overestimating the precision and importance of information - Before investors invest, they need information to select the right security however, the information may be incomplete and may not be accurate. Information arrives randomly and with noise. These investors who strongly believe in the accuracy of the information they have gathered may purchase a stock and may persist to the accuracy of their decision and when the prices rise, they will resist selling and when prices decrease, they may realize additional purchases. Overall, overestimating may provide an upward bias in prices and may help reversals as prices deviate from their fundamentals.

2) Over confidence – Over confident investors think that their information and reasoning is better than average, they are better than the average investor in reading the market. This behavioral bias makes the investor think he is smarter than he is. Overconfidence also may cause investors to trade more frequently as they believe they can time the peaks and bottoms of the price of the securities. Overconfident investor's portfolio may be overly risky and may be poorly diversified. Overconfidence increases liquidity level and over confident investors' effect on prices and reversals may be neutral.

3) Fear of regret & seeking of pride – investors feel pain after making a bad decision and they feel joy from making a good decision however, these behavioral tendencies cause investors to act in ways that inconsistent with MPT and affect the price of the securities. The fear of regret causes an investor to hold on to a stock that has dropped in price for a long time, hoping for the reversal to occur and he may than sell the stock without feeling any regret. This tendency helps reversals as investors hold on to their stocks rather than selling them. On the other hand, investors feel proud when they sell their security for a profit but this time they may sell the security sooner than they should have. This tendency has an adverse effect on prices as it thickens the free float.

4) Reference points – investors often evaluate alternatives in terms of gains and losses defined relative to a reference point rather than in terms of final results; referring to the stock price against which the current stock price is compared. Investors may have a tendency to compute profits as the difference between the

current stock price and the reference point. The effects of this tendency on prices and liquidity level depend on the reference point and it is somewhat arbitrary therefore it may be assumed as neutral.

5) The disposition effect – Investors may feel pride and regret due to their investment decisions as it is mentioned earlier. These feeling are strong when a company specific news is released relating directly to stock held in the portfolio of the investor. However, when there is an economy-wise or global news release, these investors consider it as if it is beyond its control and act differently than expected; pride predicts that a stock will be sold after a good news release but not after a good global news release. Regret predicts that a stock will be held too long after the company releases bad news but may not be held after bad economy-wide news is announced. The effects of this tendency are ambiguous and may be in the interest of further studies.

6) House money – refers to gains of a gambler meaning that when gamblers play with the money that they have gained, they treat the money as it is not theirs but house money and they take very big risks as they think so. As the gains from investment are seen as a free opportunity to take further risk, investors are willing to take shots in the stock market. If this tendency over rules investment decisions in ISE than the house money of these investors may increase the liquidity and the prices of illiquid, small cap companies' stocks. In that case, IMKB 30 may lose its power to be the proxy for stock returns in Turkey, IMKB all shares index might be a better alternative.

7) Snake bite – refers to resistance to take risk after losing in the market. This +tendency predicts that investors will prefer riskier stocks after experiencing losses in the market. This tendency clearly favors liquid securities to the illiquid ones and it may adversely affect the price of the illiquid assets. These investors tend to sell at low end of the stock's price range, acting adversely against reversals.

8) Trying to break even – This effect is just the opposite of snake bite effect. Investors, who lose in the market, try to recoup the losses by taking more risk. This tendency predicts that investors may take larger risks therefore, as illiquid stocks are more risky, illiquid stocks' prices may be affected positively.

9) The endowment effect – similar to fear of regret, this effect predicts that investors may hold on to their original portfolios rather than assessing alternatives. This effect is a do nothing effect and act adversely on reversals as investors who are exposed to this effect, may refrain from selling their relatively over valued portfolios, replacing them with undervalued portfolios.

10) Cognitive dissonance – happens when a person' actions and beliefs contradict. Investors want to be consistent and try to avoid cognitive dissonance either by altering beliefs or altering behavior. Investors may underestimate the

extent of past mistakes or over estimate the glory days. This tendency may be neutral for our study.

11) Mental accounting – refers to investor's tendency to classify activities into different accounts. Some amount of money may be allocated in mind for the education of son or car/flat purchase however; they should be treated from a portfolio point of view. This effect may be ambiguous and may be assumed neutral.

12) Representativeness – refers to the tendency of attributing future success or failure to particular incidences or events. A company with bad profitability can be seen as representative of a bad company by investors. As a result, investors may be inclined to hold "good stocks" in their portfolio which may adversely affect illiquid stocks' prices as demand for them will decline.

13) Familiarity – refers to the tendency of investors to purchase stocks of companies with which they are familiar with. They use their familiarity as a short cut to investing. Behavioral investors may pick stocks of companies where are located closer to their homes and even though they have no idea about the company's financials or future prospects, they feel comfortable about investing in such familiar companies. Their portfolios will be made up of large, well known companies and local companies, leading them to poor diversification. This tendency may also play a neutral role in our study (Nofsinger, 2005).

Investor psychology is a hot topic in behavioral finance in the modern literature and foreign fund managers are vulnerable to the above mentioned biases unless they are strictly bounded with regulatory criteria. Presumably the effect of psychology is significant on prices but for this study, these factors are held as constant.

2.4. State of the Economy

State of the economy has a crucial role in stock prices and it can be seen on Table 2 that Turkey has enjoyed successive high growth rates till the crisis of 2008. It is not a coincidence that foreign funds increased their appetite and interest for Turkish securities in the last decade. Real GDP growth figures reflects the growth in firms and higher growth rates leads to higher valuations as they factor in the equation stock valuations as follows:

$P_0 = D_1/k\text{-}g$

Where;

P_0 = Intrinsic Value of the Security

D_1 = Next Year's Dividend

k= required rate of return

g = Growth Rate

At the same time, D_1 is the product of D_0 and the growth rate therefore, it is obvious that the state of the economy influences the stock prices and foreign funds have to be interested in the growth rates. This factor plays a crucial role in attracting foreign funds to an emerging market as these funds aim to benefit from the higher growth rates of other markets.

2.5. Level of Interest Rates

Level of interest rates is a determinant of stock prices as they determine the opportunity cost of allocating funds to stock market. They affect the timing of the exit from the stock market. An inverse relationship between interest rates and stock prices is assumed. After the crisis in 2008, central banks throughout the world cut their interest rates substantially. US and Japan has lowered them below 1 %, 0.25%, 0,1 % respectively, to help their economy to recover from the global crisis and Countries like Turkey used this low interest environment and cut the interest rates almost by 10 % from 16.5 % to 6.5 % in 2008-2009 period.

To elaborate the effects of the recent crisis in 2008, UK lowered the interest rates below 2 % to 1.5 % for the first time in 315 years. Substitution effect took place and stock markets rallied in 2009. ISE enjoyed approximately 70 % increase since the beginning of the year 2009 up until mid November. Interest rates definitely effect the decisions of fund managers in investing in emerging markets both from the theoretical perspective of valuation and substitution effect perspective.

2.6. Market Risk

It is clear that foreign funds seek higher returns when they allocate funds to emerging countries but simultaneously their exposure to market risk changes as they alter the market they invest in. the new market(s) they invest in may not have sufficient depth, breadth and the market may lack some crucial regulations but more importantly the efficiency of the market may be different from the efficiency of the existing market's efficiencies. For example, past price information may be material and elaboration of efficient market concept and asset pricing models may shed light to foreign funds motivations and strategies.

Studies state that US markets are weak form of efficient and emerging markets prove to be inefficient in the studies so far. What may be understood from an efficient capital market is discussed here below and efficient market hypothesis can be defined as follows; (Fama, 1970)

2.6.1. Efficient Capital Markets

Efficient Capital Markets are markets where current price of a security fully reflects all the information currently available about that security in an efficient capital market therefore we can state that security prices adjust rapidly to new information.

Market efficiency is based on four assumptions which you can find here below:

1) A large number of interested parties analyzing and valuing stocks independent of each other.

2) New information comes to the market randomly and timing of news announcements is independent of each other.

3) Related parties adjust their estimate of security prices rapidly according to how they understand the information.

4) Expected returns include risk in the prices.

2.6.1. Efficient Market Hypothesis

Eugene Fama (1970) divided the efficient market hypothesis into three categories.

1- The weak form efficient market hypothesis assumes that current prices reflect all current security market information. Past price and volume information will be incorporated in prices thus technical analysis cannot help investors in earning excess returns. However, release of material non-public information and insider trading may lead to excess returns over the required rate of return which is derived from CAPM that can be shown here below:

$R_t = r_f + \beta (r_m - r_f) = e$

Where;

R_t = Required rate of return at time t

R_f = Risk free rate

R_m = market return

e = error term

Once the required rate of return is derived from the CAPM equation, excess return is calculated by subtracting it from the actual return occurred at the same period.

2- Semi strong form efficient market hypothesis assumes that prices adjust rapidly to the release of non-public information. Therefore one cannot earn excess returns using fundamental analysis. Release of non-public information is rapidly incorporated in prices however, still a small crowd learn the material information and they may able earn excess returns over the required return[71]

3-Strong form assumes markets that are almost perfect; information is cost free and available to everyone simultaneously. Security prices reflect all information from public and private sources. Clearly, the latter form draws attention to insider

[7] For ISE, On 3 December 2009, Fitch has announced that it has increased Turkey's credit rate by two grades. A day before the announcement, a foreign fund made purchases totaling 55 million $, and increasing the market by 2.7 % when the remaining world index's had no such returns. This reminds that ISE may not be semi strong form due to prevailing insider trading.

information and eliminates the possibility of earning excess returns using insider information.

All three forms of efficient markets clearly have the ability to adjust prices to new information as there are many interested parties in the new information but what if funds are allocated to a market where there are substantially less number of interested parties and to a market where prices do not adjust as rapidly as it is expected. In that case, foreign funds needs to learn how fast the market reacts and may earn excess returns by studying the patterns. The number of interested parties can be deduced from the volume of the stocks and bond markets but how market reacts to new information is beyond the constraints of this thesis. Grossman & Stiglitz (1980) argued that the cost of obtaining information may be a reason for markets to be –not totally efficient- because the time and money spent on research do not pay off all the time therefore current prices wouldn't reflect all the information as investors refrain from these irrevocable costs.

2.7. Liquidity

It is possible to define liquidity as the ability to trade goods and securities of large quantities quickly, at low cost, and without moving the price. This study will focus on the liquidity effects that drive prices and increase volatility temporarily or permanently in the market due to the order flow to the market, ISE 30.

Investors demand liquidity premium depending on their risk tolerance levels. Foreign funds usually invest in the blue chips of ISE 30 index due the liquidity risk of the remaining stocks. Not only systematic liquidity is a problem for foreign funds but also illiquidity of a specific stock may arise all of a sudden. This idiosyncratic liquidity risk may be better elaborated with an example from the recent past.

Emerging markets, such as Turkey, have stocks that are exposed to greater idiosyncratic liquidity risk compared to developed country's stocks. For instance, the Stock GOLTAS, a cement company that belongs to the family of a former president of Turkey, has been taken over by the state due to corruption claims and the fate of the company was going to be determined by the state courts.

There was serious uncertainty regarding the decision of the court. Meanwhile the company was delisted for a certain period of time (16 October 2005 – 22 November 2005) from the exchange, the stock has lost value with thin volume and after the stock has been listed again, the stock has gained more than it had lost prior to suspension. The drastic price movements in GOLTAS are an example of how stocks react to idiosyncratic liquidity shocks in an emerging market and that may be the reason why foreign funds relatively refrain from investing in stocks that are not listed in ISE 30 or IMKB 100. The reason why this thesis elects to work with ISE 30 can be justified as mentioned above.

2.8. Foreign Market Returns

Foreign Funds invest in various markets either for exploiting profit opportunities they have identified or for diversification benefits. It is a fact that when ISE is about to close, US markets open and when they close, NIKKEI and other Asian markets open. An investor can trade almost 24 hours a day so an investor who has gambling attitude towards stock market operations, has an all day open casino available to him or her. This fact may give rise to the international trading as well and it worth studying but it is beyond the scope of this thesis. Markets' opening and closing hours were almost always the same but especially in the last two decades, Internet enabled investors to invest in emerging markets more easily; entry barriers to a market are mitigated if not terminated. There is fierce competition among intermediary firms to have the trades of foreign investors and they try to attract them with various reports, thus, information became relatively easier to obtain and cheaper to obtain if not free.

In ISE, roughly 67 % of the market capitalization belongs to foreign funds as of December 2009 and they have more or less the same ratios in other emerging markets as well. When the market sentiment is positive in Asian markets, then the market sentiment is expected to be positive as well in ISE and European Markets and when they close positive, it gives a slight positive edge to US markets because the ones who believe that market sentiment is positive were the same crowd in Asia, Europe and US.

Business channels report the returns of world markets more often because of the possible initial effect their markets will face when they open. For example, an investor who learns at night that US markets had closed 10 % up, will probably have a strong positive sentiment for the following day and next morning, he will probably refrain from selling at the closing prices of the previous day.

Globalization is a phenomena that altered the investment dynamics and S&P 500, DAX, FTSE returns, which are expected to be influential on ISE returns, are added to the list of missing variables in Omitted Variables Hypothesis in order to help better explaining the returns in ISE 30.

2.9. Other Factors

There may be numerous factors affecting stock prices including political risks, growth rates, inflation, GDP and breadth of the market. These effects are held constant in this study in order to focus on the foreign funds' effects and liquidity effects on security prices. However, some of them may heavily affect the decisions of foreign investors;

Kim & In (2005) investigate the relation between stock returns and inflation via wavelet analysis; and they provide evidence that there is a positive relation between

them at the shortest and the longest term but there is negative relation between them when the term is intermediate.

Bekaert et al (2006), show evidence that institutional investors may face constraints on the markets they want to invest in due to the political risk the country has. In countries with high political risk, the liquidity is priced strongly; but in countries where political risk is negligible, liquidity risk may not even be priced.

Currency risk may be one of the most promising factors that effect the decision of foreign traders as carry trade is the hot issue of this decade. Currency return may be more than the market return in some cases and this area is open for research but this thesis elects to keep currency effects as neutral and no particular currency is added to the omitted variables list.

3. Foreign Trades and Foreign Investors

Even though, foreign investors are not a homogenous group on their own, their structure, strategies and their way of reasoning is within the scope of this study. It is obligatory to know their structures and strategies to understand their business patterns.

Turkish economy may be unique in its ability to cope up with the crises that have been survived through in the recent decades. The performance of Turkish economy in the previous decade however, was too scary for foreign investors but when they realized the benefits of greater international diversification, as mentioned by Clark & Berko (1996), for example, U.S. investors have bought foreign shares at 25 times the quotes observed during the previous ten years. Emerging markets, mainly the markets in South Asia and South America, were at the target and Turkey was somehow neglected as foreign investors might have refrained from taking risk in a market where so much risk involved and they didn't increase their participation rates in the market until 2002 when the EU accession issue was seriously put on the table. The possibility of EU membership triggered foreign inflows to the market. Whether the presence of non-domestic funds results in permanent or temporary changes in prices or not has been studied in the literature as earlier presented in the literature review. Basically, when non-domestic funds arrive liquidity may increase and more risk sharing may occur which may lead to decrease in risk; upon lower risk levels; stock values should rise but still, possible strategies of foreign investors, their rebalancing needs, their share in futures and options market in ISE and their structure has to be well understood and there fore, they are introduced here below.

3.1. Rebalancing Need of Institutional Portfolios

Among various rationale behind institutional trades, rebalancing, its costs and benefits to the portfolio, is not clear. There are constant institutional trades in the markets not only arising from their pursuit of profit but also arising from their necessity of rebalancing their portfolios. The primary benefit of rebalancing is maintaining the investor's desired exposure to systematic risk factors because if the portfolio managers "let it ride", than there may be no transaction costs incurred but in theory, riskier securities may gain higher value than its less risky peers and their percentage in the portfolio may rise unintentionally.

To be more specific, assume that there is a portfolio which is composed of 50 % of bonds and equity each. If the value of equities increase in the portfolio than

their percentage will be over 50% and resulting in a portfolio which is not fifty-fifty in bonds and equities anymore. However original investors of the fund may have invested in the portfolio in order to be exposed to the original levels of risk and if no rebalancing is done, their level of risk may deviate from the original level therefore the portfolio may be rebalanced by selling equities and purchasing bonds so that portfolio returns back to its original levels.

A potential gain of rebalancing may be discipline If a portfolio is not rebalanced after an increase in equity prices, the prices of the equities may fall back to its original values and a profit opportunity may be missed. The missed opportunity when there is no rebalancing activity is the cost of not rebalancing.

Institutional trades are usually composed of large orders and therefore they require liquidity. When the trade requires liquidity, bid ask spread may be substantial and when the trade provides liquidity to the market than in that case, the transaction cost may be negligible. In short, transaction costs and tax liabilities arising from rebalancing are the main costs of rebalancing. (Arnott et al.,)

There are two approaches to the timing of rebalancing, Calendar Rebalancing, which is rebalancing a portfolio regularly with pre-determined intervals like, monthly, quarterly; percentage of portfolio rebalancing (PPR), which is rebalancing a portfolio when a change occur in the value of the securities.

These approaches have to be taken into consideration because in the former one if some parties know that a rebalancing is about to come and if they know that the equity markets are up for months, they may figure out that sell orders will come from these institutions and by taking a bearish position they may reap profits from this information or vice versa. Whether these situations fit to the mosaic theory or not and whether these situations constitute crime is albeit interesting, beyond the scope of these study.

3.2. Dynamic Rebalancing Strategies Versus Buy and Hold Strategy

Institutions need strategies to follow because when they are monitoring the performance of their funds, an action may be required to be taken or not. The action to be taken shall be determined solely by the strategy that is preset at the initiation of the fund. The strategy may be flexible and subject to change. These strategies are introduced here below:

3.2.1. Buy and Hold Strategy

This strategy is simple, straight forward and easy to calculate as no transaction costs involved other than the initial buy order. This is not an active strategy; the initial mix is between stocks and debt instruments. The ratio of stocks to total fund value is initially fixed but the ratio varies as the values of securities change. The floor value of the fund is the value of debt securities. In Figure 1, the slope of 0.4 shows that 40 percent of total assets are initially invested in stocks.

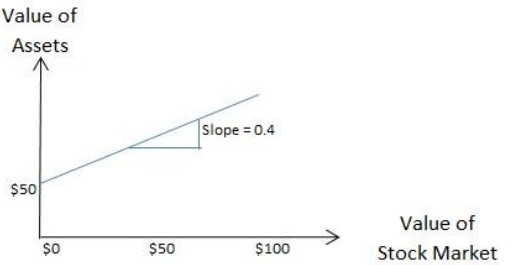


Figure 1. *Buy and Hold Strategy*
Source: Arnott et al.

3.2.2. Constant Mix Strategy

In this strategy the percentage of the portfolio invested in stocks (the slope coefficient) is preset between a value of zero and one, which is determined by the risk aversion of the fund and in order to adhere to this ratio, constant mis, constant rebalancing is required. To summarize the strategy, the fund purchases stocks as they fall and the fund sell stocks as they rise in order to meet the initial stock to total asset ratio. In this strategy, the floor value is at zero due the reason that the strategy dictates you to purchase as the stocks fall so if stock market falls continuosly as the crisis in 2008 fall, the fund will be 100 percent stocks which may theoretically loose their whole value.

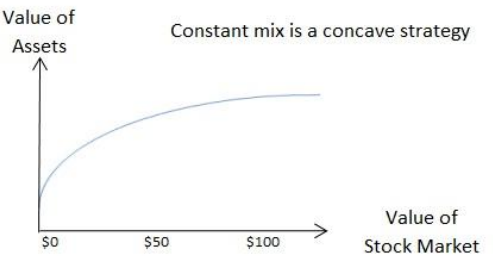


Figure 2. *Constant Mix Strategy*
Source: Arnott et al

Figure 3 depicts the comparison of two strategies by comparing figure 1 and figure 2. If stock market reversals occur, constant mix outperforms buy and hold

strategy between A and B in figure 3 but if reversals don't occur buy and hold strategy outperforms constant mix strategy.

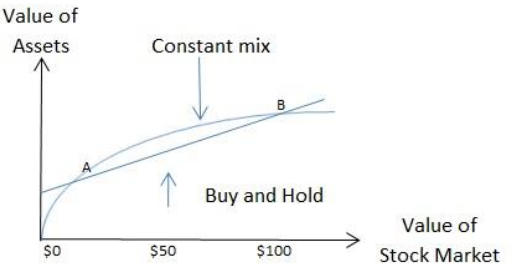


Figure 3. *Buy and Hold vs. Constant Mix in a Market with Reversals*
Source: Arnott et al

3.2.3. Constant Proportion Strategy (CPPI)

The strategy is also known as constant proportion portfolio insurance strategy. Rather than a ratio as it is in the constant mix strategy, CPPI uses an equation to determine the required dollar amount of stock which can be found here below:

$ in stock = M(TA-F)

Where:

M = stock investment multiplier (proportion)

TA = total assets held in the portfolio

F = the minimum allowable portfolio floor value

(TA-F) = funds that can be used in riskier assets

In this strategy, a slope coefficient, m, is set at a value greater than 1. Floor value of funds assets is a positive value and the value increases as debt instruments held in the portfolio matures. Fund managers invest a constant proportion, m, of the cushion (T-F) in stocks. When T-F reaches to zero, fund stops investing in stocks.

To illustrate how this CPPI strategy works the following example is produced;

Assume a portfolio with total assets of 100$ with a minimum floor value of 80$. Slope coefficient is 2. In this case, the initial portfolio amounts for cash and stocks are as follows:

M (TA-F) = 2 (100-80) = 40 $

40$ worth of stocks will be purchased and 60$ of cash will be in cash. If the market falls 10 %, stocks in the portfolio also fall 10%, our portfolio will have 36 $ of stocks and 60 $ of cash for a total of 96 $. In order to determine the amount of stock to be hold in the portfolio, same formula is used. M(TA-F), 2 (96-80) = 32 $.

Thus, under CPPI strategy, 8 $ worth of stocks should be sold and after the portfolio is rebalanced the portfolio will contain 32 $ of stocks and 60 $ of cash.

To summarize, CPPI strategy sells when the market goes down and buys when the market goes up. The minimum floor value works like a stop loss point.

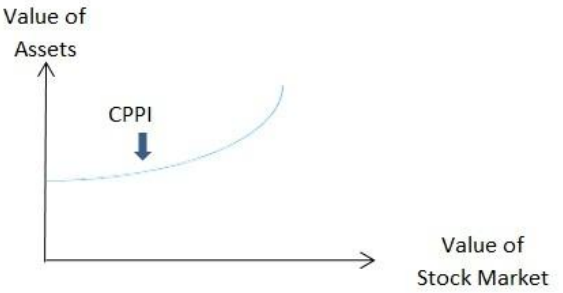


Figure 4. *CPPI Strategy*
Source: Arnott et al

3.3. Comparison of Strategies

The buy and hold investor move along a straight line in the payoff diagram. The constant mix investor constantly rebalances the portfolio either by selling or buying stocks. The slope of the payoff line changes depending on the transactions involved. In CPPI strategy, the slope is constant but the minimum value fluctuates as the value of stocks change. CPPI sells stocks as they fall and buy them as they rise and constant mix buys stocks as the fall and sells them as they rise. A constant mix strategy outperforms buy and hold and CPPI strategies in a flat but oscillating market whereas, CPPI outperforms buy and hold and constant mix strategies when no reversals occur in the market. Thus, CPPI is the strategy in bear or bull markets. When market ends up near its starting point are likely to favor constant mix strategies and when market closes far from the starting point, CPPI strategy is favored.

Constant Mix- Investor risk tolerance is constant regardless of wealth level. No matter how big the wealth is, investor holds stocks in the same proportion. CPPI- investor risk tolerance is zero when total assets reach to the floor value Buy and hold- risk tolerance increases proportionately with wealth, as stocks gain value, they become an increasing proportion of the portfolio. The overall portfolio risk increases but rebalancing is not an issue. Following table depicts the comparison of the dynamic strategies mentioned above.

Table 4. *Impact of Strategies on Risk and Return*

	Buy and Hold	Constant Mix	CPPI
Return	Outperforms CPPI in a flat but oscillating market; outperforms a constant mix strategy in a trending market	Outperforms CPPI and buy and hold strategy in a flat and oscillating market	Outperforms a buy and hold strategy which outperforms a constant mix strategy in a trending market
Risk	Passively assumes that risk is directly proportional to wealth	Constant risk tolerance regardless of wealth level	Actively assumes that risk is directly proportional to wealth

Brown, Harlow & Starks (1996) show evidence that fund managers may have different styles but their consistency is important and it adds value; they find negative relationship between portfolio turnover and style consistency of a fund; they find a positive relationship between a fund's style consistency and the funds' relative returns; they find a positive relationship between a fund's style consistency and persistent future performance of the funds over time. It is clear that identification of foreign investors should include the style and/or the strategy of them in the related databases.

3.4. Presence and Participation of Non-Domestic Funds in Futures Contracts of ISE

The impact of non- domestic portfolio flows of international investors on ISE is observable with the results of this study and the data that is presented hereafter but despite the high participation rate of foreigners, their low presence in the daily trading volume in futures market is surprising.

In the sample period used, non-domestic share in the trading volume didn't annually exceed 25 % which was in 2007 but monthly it has reached to 33 %, in 2007 October. These figures indicate that non-domestic funds have not yet dominated the market in short term trading. It can be inferred that day traders are mostly domestic investors in futures market and majority of the free float belongs to domestic investors. If the inferences are correct, then especially the impact of the price pressure arising from foreign inflows seems to be limited. It is worth to note that there is a dramatic change in the year 2009; domestic investors have a ratio of 91.33 % in trading volume up until December. Again, almost half of 2009 is the at the end of our sample period and for further studies it may be inferred that foreign investors invest long term, (as it can be seen that their transactions' share is much lower relative to domestic ones; they may have decided to invest long term in Turkey for any reason or liquidity level in futures in ISE may not suffice the needs of foreign investors. If foreign fund managers had had a strategy of reaping profits in the short term, they would have a more significant presence in the trading volume of future contracts because the leverage in Future markets is more beneficial for them when it is compared with directly investing stocks. Intuitively,

the chance of a significant price pressure arising from foreign inflows is remote when the trading volume of foreigners in futures contracts of ISE is taken into consideration.

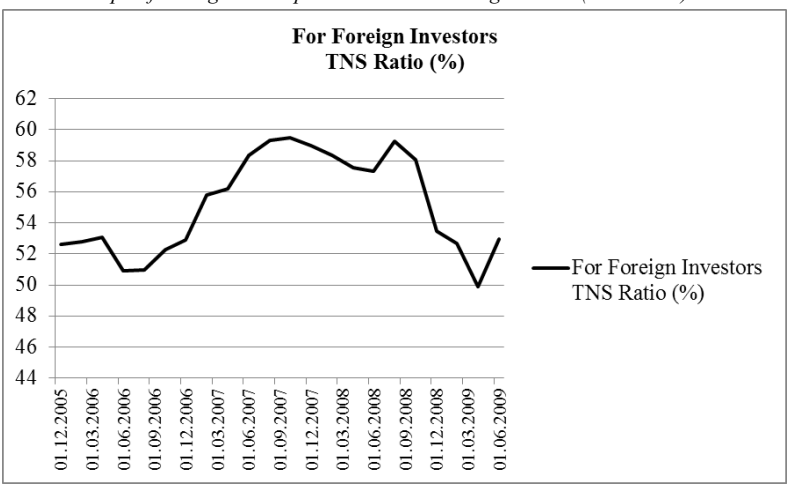
Table 5. *Shares of Domestic and Non-domestic Investors in Monthly Trading Volume of ISE.*

	Domestic (%)	**Non-domestic (%)**		**Domestic (%)**	**Non-domestic (%)**
2005	**86.95**	**13.05**	**2007**	**74.95**	**25.05**
January			January	85.67	14.33
February	99.90	0.10	February	81.56	18.44
March	99.65	0.35	March	85.47	14.53
April	96.63	3.37	April	72.96	27.04
May	97.91	2.09	May	82.62	17.38
June	97.49	2.51	June	70.17	29.83
July	88.38	11.62	July	78.49	21.51
August	83.85	16.15	August	71.13	28.87
September	84.36	15.64	September	78.69	21.31
October	81.67	18.33	October	66.81	33.19
November	80.58	19.42	November	77.03	22.97
December	96.22	3.78	December	70.11	29.89
2006	88.69	11.31	2008	77.23	22.77
January	95.52	4.48	January	79.64	20.36
February	92.17	7.83	February	70.90	29.10
March	93.47	6.53	March	76.26	23.74
April	87.20	12.80	April	73.27	26.73
May	92.57	7.43	May	80.81	19.19
June	90.47	9.53	June	73.29	26.71
July	94.14	5.86	July	77.86	22.14
August	84.08	15.92	August	73.20	26.80
September	85.73	14.27	September	79.51	20.49
October	85.19	14.81	October	74.72	25.28
November	86.83	13.17	November	86.14	13.86
December	87.60	12.40	December	85.70	14.30
2009	91.33	8.67	2009	91.33	8.67
January	92.01	7.99	July	93.70	6.30
February	88.75	11.25	August	90.91	9.09
March	93.23	6.77	September	95.01	4.99
April	90.25	9.75	October	89.85	10.15
May	93.37	6.63	November	93.40	6.60
June	85.01	14.99	December		

Source: VOB. *In order to differentiate, real persons that are not Turkish citizens according to the ID information at Takasbank A.S. and corporations that are based abroad are assumed to be non-domestic and rest is assumed as domestic investors.

International investors' obvious presence is increasing its dominance in almost all of the stock markets around the world and their presence and dominance in ISE is increasing with the increased interest of hedge funds and mutual funds to the market in the last decade. Their share has reached to approximately 72 % of the total in 2007; and while this study is being written, their share is 67 % of the total despite the crisis of 2008. Table 6 and Table 7 depicts the recent history of the foreign participation in ISE.

Table 6. *Graph of Foreign Participation in ISE according to TNS (2005-2009)*

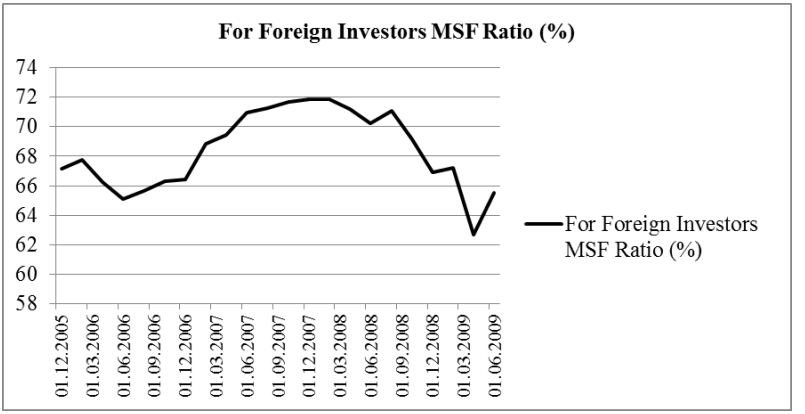


Source: MKK

Intuitively, funds arriving to the market move prices up and when funds exiting the market move the prices down. This may partly due to the low levels of liquidity, depth and herding behavior of the market. This study is interested in the relation between foreign investors' trades and equity returns as well as institutional trades and equity returns.

Here below, it can be seen that foreign investors increased their interest in Turkish stocks and increased their shares up to 72 % and despite the global crisis, their ratio has leveled around 65 % as of June 2009.

Table 7. *Graph of Foreign Participation in ISE according to MSF (2005-2009)*



Source: MKK

When period under study is narrowed to 2005-2009, it is clear that market shares of domestic and foreign investors don't fluctuate much compared to the 2000-2009 period. These graphs may support base broadening hypothesis that once foreign investors' shares have increased sharply 60-70 % levels, contrary to price pressure hypothesis, they remained at that levels despite the serious crisis occurred by the end of the period.

It may be inferred that foreign funds arrive to the market not to reap profits due to the temporary illiquidity but rather they leave their position open in order to pursue further capital gains. There may be various rationales behind the strategy of foreign funds but examination of Table 6 and Table 7 denies the price pressure hypothesis with the reality that foreign funds have increased their market share in the recent decade as discussed briefly in this thesis.

3.5. Structure of Foreign Investors in ISE

Emerging markets attract various foreign investors as well as domestic investors who are composed of real persons, legal persons, mutual funds and investment trusts. Decomposition of the investors according to number of investors and number of accounts in İMKB is depicted in the charts below:

Resident	Identity Type	Total Number	Total Number of Investments Carrying Balances	Total Amount of Balances for Stock Shares	Stock Market Value Held In Accounts
Domestic	Others	17.844	180	281.738.500	1.555.194.476
Domestic	Mutual Funds	516	206	161.475.593	801.038.887
Domestic	Real Person	7.279.581	918.787	4.888.391.400	15.731.036.599
Domestic	Legal Person	75.891	1.889	1.766.871.261	7.926.639.442

Domestic	Investments Trusts	48	37	63.728.133	280.908.099
Foreign	Others	2.934	17	8.112.794	33.114.205
Foreign	Mutual Funds	3.976	988	3.269.179.976	20.608.234.720
Foreign	Real Person	31.302	3.816	52.299.527	186.710.210
Foreign	Legal Person	18.594	1.180	4.354.685.480	28.112.272.741
	Minumum	48	17	8.112.794	33.114.205
	Average	825.632	103.011	1.649.609.185	8.359.461.042
	Standart Deviation	2.420.349	315.918	2.009.055.966	10.603.927.349
	Maximum	7.279.581	918.787	4.888.391.400	28.112.272.741
	Grand Total	7.430.686	927.100	14.846.482.663	75.235.149.379

Table 8. *Number of Investors by Categories (Source:MKK)*

It should not be surprising that composition of domestic and foreign investors differ significantly. This may be partly due to the different perceptions of investors for the stock markets, discrepancy between the resilience of the markets which may lead investors to refrain from investing via financial organizations. It is also possible to see the structure by accounts rather than by number of investors as well

When the structure of domestic investors is examined, Real person constitutes approximately 60% of the total stock value held in accounts and Legal person constitute approximately 30% of the total stock value held in accounts. Mutual funds and investment trusts are not attractive for Turkish investors; they are either not informed about them or Domestic investors don't trust in their services but they rather choose to make transactions on their own.

Whereas, when the structure of foreign investors is examined, Real person constitutes only approximately 0.42% of the total stock value held in accounts and Legal person constitute approximately 57% of the total stock value held in accounts and mutual funds constitute approximately 42% of the total stock value held in accounts. Therefore, it can be concluded that foreign investors mean; mutual funds and legal person, the rest is negligible.

Table 9. *Number of Accounts by Categories*

Resident	Identity Type	Total Number	Total Number of Accounts Carrying Balances	Total Amount of Balances for Stock Shares	Stock Market Value Held In Accounts
Domestic	Others	21.818	233	281.738.500	1.555.194.476

Domestic	Mutual Funds	707	208	161.475.593	801.038.887
Domestic	Real Person	11.417.440	1.011.968	4.888.391.400	15.731.036.599
Domestic	Legal Person	113.024	2.713	1.766.871.261	7.926.639.442
Domestic	Investments Trusts	19	44	63.728.133	280.908.099
Foreign	Others	3.007	17	8.112.794	33.114.205
Foreign	Mutual Funds	8.027	1.061	3.269.179.976	20.608.234.720
Foreign	Real Person	32.448	3.844	52.299.527	186.710.210
Foreign	Legal Person	23.768	1.358	4.354.685.480	28.112.272.741
Minumum		19	17	8.112.794	33.114.205
Average		1.291.140	113.494	1.649.609.185	8.359.461.042
Standart Deviation		3.797.524	336.930	2.009.055.966	10.603.927.349
Maximum		11.417.440	1.011.968	4.888.391.400	28.112.272.741
Grand Total		11.620.258	1.021.446	14.846.482.663	75.235.149.379

Source: *MKK*

4. Data and Methodology

Data is formed from the databases of Metastock®, IMKB and MKK. IMKB 30 is chosen as a proxy to represent returns in ISE. Adabag & Ornelas (2005) have used ISE all share index as a proxy to represent the returns in ISE but intuitively, foreign funds concentrate their investments mostly in stocks where exit costs are lower and liquidity is higher; therefore, IMKB 30 may be more representative than all shares index when foreign participation and its effects are to be tested. Baklaci (2009) have used 20 stocks, 14 of them were from IMKB 30. This was an option but the election of these 20 stocks out of all stocks seems arbitrary and the effect of the remaining stocks should not be missed.

The period studied is 01.12.2005 to 01.06.2009, the period contains the global crisis of 2008 and that's why it is normal to expect fluctuations in both prices and foreign participation; the former expectation is fulfilled but interestingly, foreign participation does not change much as it is expected from the past experiences of the market. Both of the foreign participation ratios remained more or less the same in the period under study which may be due to relatively higher liquidity costs than other markets, in that case funds elect to meet their liquidity needs from other markets and keeping their positions in ISE or they may have continued to believe in the promising story of the market despite the global crisis. The post analysis tends to favor the second explanation as Fitch increased the credibility rate of Turkey by two grades which had positive reflections on the security prices.

For some tests, monthly data is used which has a size of 42 and for feedback trading, weekly data is used, in those cases sample size rises to 176. For foreign inflows two proxies have been used, the first one, TNS indicates the change in the number of shares outstanding that foreign investors hold, regarding to the total number of shares outstanding in the market. MSF is the second proxy and is calculated as the change in foreign participation rate according to market capitalization of the market. MSF is price biased because MSF increases as the price of the securities hold substantially by foreigners increase. When MSF increase it doesn't necessarily mean that foreign funds are investing new funds, the rise may be due to the price increases of the existing shares as mentioned above in the market. However, when the number of shares outstanding measure, TNS, is used, than a clearer point of view mat be obtained because it shows evidence that

domestic investors have sold their securities to foreign investors or vice versa. STATA® has been used for statistical tests.

4.1. Premlimenary Analysis

MSF has a stable but relatively downward trend in the period studied whereas; TNS has a steadier and slightly increasing trend[81]. We can conclude that because during the sample period TNS increased slightly from 52.63 % to 52.94 % it almost remained same. MSF has decreased from 67.15 % to 65.51 %. When the trend of both TNS and MSF is examined they seem stationary where as IMKB 30 returns seem volatile due to the crisis occurred in 2008. In order to verify these observations Augmented Dickey Fuller Tests are applied to TNS, MSF, and IMKB 30 returns. Results are discussed here below.

4.1.1. Unit Root Test and Covariance Stationary

Three conditions have to be satisfied in order a time series to be covariance stationary which are listed here below;

1- Constant variance

2- Constant expected value

3- Constant covariance with leading or lagged values

As mentioned above, the third requirement for covariance stationary in a time series data requires that the absolute value of the coefficient on the lag variable should not exceed one:

- If the value of the lag coefficient is equal to one, it means it has unit root and the time series is a random walk.
- If the value of the lag coefficient is more than one in absolute terms than the time series has an explosive root.

A random walk is when the predicted value of the series in one period is same as the value of the series in another period, plus some random error. Random walks are not covariance stationary because:

$X_t = b_0 + b_1 x_{t-1} + e_t$

Where:

$B_0 = 0$ (a random walk)

$B_0 \neq 0$ (a random walk with a drift)

$B_1 = 1$ (a random walk with or without a drift)

For all of the cases, the mean reverting level shall be:

$b_0/1 - b_1$

A time series must have a mean reverting level to be covariance stationary but when there is random walk, this mean reverting level cannot be defined because

[8] This may be interpreted as foreign funds sell the stocks that gain value more and purchase the cheaper ones, indicating a constant mix strategy in ISE

when the lagged coefficient has a coefficient of 1, then the denominator equals to zero which makes the equation undefined.

A time series with a unit root is a serious problem because conclusions derived from trendy; either increasing or decreasing. The way to correct these conclusions is called first differencing. First differencing converts a time series that is not covariance stationary into a one that is; while first differencing, the value of the previous time series is subtracted from the current value of the time series

In this thesis, Augmented Dickey Fuller test on our times series of TNS and MSF on both monthly and daily terms indicates that these two series are stationary whereas, IMKB 30 return is not stationary with both daily and monthly data. After first differencing IMKB 30 returns become stationary. After preliminary analysis, Chen (2002) has built a Granger VAR for Taiwanese Data; it has been found that return causes foreign trading in both pre-crisis and post-crisis terms whereas, foreign transactions lead to changes in return only before crisis and Ornelas & Adabag (2005) have studied whether net foreign portfolio inflows granger causes ISE returns or ISE returns granger causes net foreign portfolio inflows as well.

4.2.1. Causality Analysis

Traditional Granger causality between TNS and IMKB 30 returns (Returns hereafter) and MSF with IMKB returns are tested with the following VAR models:

$$Return_t = a_0 + \Sigma^n_{i=1} \alpha_i Return_{t-i} + \Sigma^n_{i=1} \beta_i MSF_{t-i} + e_{1t}$$

$$MSF_t = a_0 + \Sigma^n_{i=1} \delta_i MSF_{t-i} + \Sigma^n_{i=0} \omega_i Return_{t-i} + e_{2t}$$

Where:

$Return_t$ is return at time t and a_i's are the constant terms.

A Wald F test is used to check the following hypothesis:

H1: MSF does not granger cause Return: $\beta_i = 0$, i = 1 to n

H2: Return does not granger cause MSF: $\omega_i = 0$, i = 1 to n

If both hypotheses are rejected then there is Granger bi-causality between the two variables. Similarly for TNS, the following VAR model is used:

$$Return_t = a_0 + \Sigma^n_{i=1} \alpha_i Return_{t-i} + \Sigma^n_{i=1} \beta_i TNS_{t-i} + e_{1t}$$

$$TNS_t = a_0 + \Sigma^n_{i=1} \delta_i TNS_{t-i} + \Sigma^n_{i=0} \omega_i Return_{t-i} + e_{2t}$$

Where:

$Return_t$ is return at time t and a_i's are the constant terms.

A Wald F test is used to check the following hypothesis:

H3: TNS does not granger cause Return: $\beta_i = 0$, i = 1 to n

H4: Return does not granger cause TNS: $\omega_i = 0$, i = 1 to n

Six lags of TNS have been used to assess whether lagged values of TNS Granger causes IMKB 30 returns or not. As can be seen in Table 1 in the Appendices, none of the lagged values of TNS is significant at 10 % significance

level and the results indicate that TNS does not granger causes IMKB 30 returns. This result is in line with the results of Ornelas and Adabag (2005; p.8) whose study included another period of 1997 to 2004. Similarly, six lags of IMKB 30 return have been used to assess whether lagged values of IMKB 30 returns Granger causes TNS or not. It can be observed in Table 2 of Appendices that Return Month t-1 has coefficients that are significant at 1 % for up to 5 lags and for the sixth lag the significance level is at 5 %. It may be concluded that Return Month t-1 Granger causes TNS. This result is different from the result of Ornelas & Adabag (2005). They have found no Granger causality between net portfolio inflows and IMKB returns. This may indicate that Foreign Funds chase past returns in the period of end of 2005-first half of 2009. This supports our findings of positive feedback trading that is present in the market. Some of the lagged values of independent variables have been removed from the equations when variance inflator factor exceeds 10 as a rule of thumb. Using both Akaike Information Criterion and Schwarz Criterion, the specification with six lags is chosen for both of the equations.

Instantaneous Granger causality analysis is conducted for robustness and similar results are obtained. Instantaneous Granger is a variant of granger causality analysis where contemporaneous returns or contemporaneous TNS values are included as independent variables to the equation used in granger causality analysis. No evidence of instantaneous Granger causality is found TNS and IMKB returns both ways as the coefficients that are expected to be significant at least at 10 % significance level, are insignificant. Therefore, it may be inferred that there is no instantaneous granger causality between TNS and IMKB 30 returns however, In table 4, in the appendices, it can be noticed that the significant coefficients of lagged values return month t-1 support the granger causality between TNS and IMKB 30 returns mentioned above. Interestingly, in equation with three lags in table 4, all the lagged coefficients of IMKB 30 returns are significant (return month t-1 at 1 %; return month t-2 and return month t-3 at % 5).

4.2. Methodology

There are four hypothesis that may help in understanding the stock returns and non-domestic funds inflows relationship which are tested and are presented here below;

4.2.1. The Base Broadening Hypothesis

The equation is a deviation from the basic form of the regressions in Warther's study of mutual fund flows and U.S. stock and bond returns (1995) and study of Clark & Berko (1996) about foreign inflows to Mexican Market, and their regression could be written with the measures used in this thesis as follows:

$$Return_t = \beta_0 + \beta_1 MSF_t + e_t \quad (1)$$

$$Return_t = \beta_0 + \beta_1 TNS_t + e_t \quad (2)$$

Merton's model implies that when domestic and foreign investors have the same access to the same information, they will form their portfolios similarly and allocate their funds equivalently. For Instance, if foreign investors constitute one-fifth of the investors that are informed about Turkey, according to Merton's model they would be expected to account for one-fifth of the holdings of Turkish stocks. However, MSF or TNS ratio overcomes the flaws of these assumptions and enables this study to use exact data in which there are times the above mentioned assumption doesn't hold.

There are other hypothesizes that should not be overlooked when analyzing the relation between foreign inflows and ISE stock returns; this thesis tested the following ones.

4.2.2. The Price Pressure Hypothesis

Warther's approach has been modified and lagged values of market share of foreigners for six following periods have been added to reach the regression equation below.

$$Return_t = \beta_0 + \Sigma^n_{i=1} \alpha_i Return_{t-i} + \Sigma^n_{i=0} \beta_i MSF_{t-i} \quad (3)$$

The null hypothesis is expected to be rejected according to the temporary illiquidity theory. As increases in foreign inflows shall lead to increase the prices temporarily and the price reversals shall occur in the coming periods. Thus, lagged MSFs shall have significant negative coefficients whereas; contemporary MSF shall have a significant positive coefficient to indicate an inflow of funds.

H_0: $\beta_2, \beta_3, \beta_4 = 0$

Warther's approach has been modified and lagged values of number of shares of foreigners to the total number of shares for six following periods have been added to reach the regression equation below.

$$Return_t = \beta_0 + \Sigma^n_{i=1} \alpha_i Return_{t-i} + \Sigma^n_{i=0} \beta_i TNS_{t-i} \quad (4)$$

Similarly, the null hypothesis here below is expected to be rejected according to the temporary illiquidity theory. As increases in foreign inflows shall lead to increase the prices temporarily and the price reversals shall occur in the coming periods. Thus, lagged TNSs shall have significant negative coefficients whereas; contemporary TNS shall have a significant positive coefficient to indicate an inflow of funds.

H_0: $\beta_2, \beta_3, \beta_4 = 0$

4.2.3. The Omitted Variables Hypothesis

Earlier studies[9] have used similar regression equations to incorporate the effects of additional variables as depicted below;

$$Return_t = \beta_0 + \Sigma^n_{i=1} \beta_i TNS_t + \beta Z_t + e_t \quad (5)$$

$$Return_t = \beta_0 + \Sigma^n_{i=1} \beta_i MSF_t + \beta Z_t + e_t \quad (6)$$

A vector of coefficients have been shown by β in the equation above whereas, a vector of additional independent variables are indicated by Z_t. if omitted variables hypothesis is right and if this study correctly places the omitted variables to the equation above then, the null hypothesis that the coefficient on foreign inflows is expected to be equal to zero.

H_0: $\beta_1 = 0$

It has to be kept in mind that theoretically, the model that is used in these studies may neglect some other significant explanatory variables. When that is the case, the R-square of the regression may not improve; it doesn't necessarily mean that there is a significant relationship solely between prices and foreign inflows because this significant relation may be owed to the missed variables that this study fails to incorporate to its model. Perhaps, if these missed variables have not been neglected, the null hypothesis that the coefficients of omitted variables are equal to zero might have been rejected. The clear contribution of the omitted variables hypothesis is the fact that it changes the magnitude of the coefficient of the foreign inflows, thus reduce the explanatory power of it and make it more realistic (Clark & Berko, 1996).

4.2.4. The Feedback Hypothesis

This thesis tests for feedback trading by regressing change in foreign inflows on the returns for each of first, second, third and fourth weeks of the current month and third and fourth week of the previous month[10]. and also the first approach is also to be taken for robustness purposes.

This thesis follows Warther (1995) and Clark & Berko (1996), Ornelas & Adabag (2005) however, in defining the returns; Clark & Berko (1996) have divided a month into four equal weeks; the first seven calendar days of the month as week 1 returns ($w1_t$), week 2 returns ($w2_t$) as the returns in the second seven calendar days, week 4 returns ($w4_t$) as the last seven calendar days and week 3 returns (w3t) as the return over the seven calendar days ending with the beginning of week 4.

[9] Clark & Berko, (1996), and Ornelas & Adabag, (2005), have used similar models but they have used measures other than MSF and TNS.

[10] In some months where official holidays are more than five days, four weeks may exceed a month due to the measure used but the measure is believed to be helping the materiality of the model.

The rationale behind the composition of week 3 and week 4 may be the tradeoff between the significance of the last three days of a month and the significance of three mid-month calendar days' effect on prices. Most of the funds report internally at the end of each month so they are more likely to transact in the last three days of each month in order to present the position of the fund as they desire to present.

Previous studies either have lost 3 days in the middle of the month or have lost 3 days at the end of the month or some have extended the last week to 10 days in order not to lose the possibly material 3 days. This study also agrees the possible materiality of the lost 3 days but uses an alternative measure. There are days the market is closed due to various reasons including official holidays and heavy snow etc. every five successive working day when the market is open, has been accepted as a week.

The regression used in Clark & Berko (1996) could be modified with the measures used in this thesis here below:

$$MSF_t = \beta_0 + \beta_1 Month_t + \beta_2 w3_t + \beta_3 w2_t + \beta_4 w1_t + \beta_5 w4_{t-1} + \beta_6 w3_{t-1} + \varepsilon$$

$$TNS_t = \beta_0 + \beta_1 Month_t + \beta_2 w3_t + \beta_3 w2_t + \beta_4 w1_t + \beta_5 w4_{t-1} + \beta_6 w3_{t-1} + \varepsilon$$

Where;

$$Month_t = w1_t + w2_t + w3_t + w4_t$$

Under the positive feedback hypothesis, the null hypothesis of all coefficients of individual weekly returns is expected to be rejected. The base broadening hypothesis would predict no effect from the last month and a similar effect for each of the weeks in that particular month.

H0: $\beta_2, \beta_3, \beta_4, \beta_5, \beta_6, = 0$

Whereas, Ornelas and Adabag (2005; p. 12) used an equation for the same approach, which is driven from Warther's equation but one month lagged NFPI is added as an exogenous variable for robustness purposes, their equation is as follows:

$$NFPI_t = \alpha + NFPI_{t-1} + \beta_1 w4r_t + \beta_2 w3r_t + \beta_3 w2r_t + \beta_4 w1r_t + \beta_5 w4r_{t-1} + \beta_6 w3r_{t-1} + \varepsilon$$

Where $r_t w_j$ is the weekly return of the week i of the month t.

Warther (1995) states that if there is a higher positive correlation between monthly flows and returns from weeks at the beginning of the same month and end of the previous month, than between monthly flows and returns during the last weeks of the same month, then positive feedback hypothesis may not be rejected. In other words, when β_1 and β_2 are less significant than the other coefficients, the positive feedback strategy may be addressed in the market; and if they are more significant than positive feedback hypothesis is rejected.

5. Test Results and Inferences from the Outcomes

This study aimed to provide valid answers to the following questions;

A- Do foreign flows affect stock prices significantly and permanently?

The correlation between stock returns and foreign inflows is tested. Base Broadening Hypothesis is tested and supported to show evidence of the effect of foreign flows in security prices. This study has predicted a significant effect of foreign inflows to stock prices and it has substantiated that significance upon which we can comment on the adverse and positive effects of foreign inflows.

B- Are the increases in stock prices arising from foreign trading due to lack of liquidity? Do price reversals follow the prior price increases?

Assuming the above mentioned hypothesis that foreign inflows leads to increase in stock prices; this study aims to test whether these price increases are temporary or permanent. In one hand, if the study can state that the price increase is permanent meaning that there is no evidence of price reversals, then the outcome will support base broadening hypothesis. On the other hand, if the study shows evidence that there are evidences of price pressure, then, Base Broadening Hypothesis will lose ground. No significant price pressure is found in the sample term in ISE, indicating that foreign funds invest in ISE for long term investment intentions. Interestingly, price pressure is present in ISE, when the sample term is tailored, excluding global crisis of 2008, indicating foreign trades might have exerted price pressure and have bullied out the free float to obtain profits. To be concise, price reversals are more likely in normal times when there is no crisis in ISE.

C- How about other factors affecting stock Prices?

Other variables are added to the regression in order to understand whether these variables diminish the influence between flows and returns. Obviously, there are other factors that affect the price of the securities and those factors should be incorporated into prices to extract a more valid outcome. Omitted variable bias hypothesis as explained in its section briefly, takes these variables' effects into consideration.

Intuitively, these added factors will reduce explanatory power of foreign flows in security prices but to what extent is the question this thesis aims to answer. The added variables may decrease the influence between foreign flows and returns to such levels that it can be concluded that the base broadening is not as strong as it is assumed or vice versa. Inclusion of alternative equity investment options throughout the globe to the regressions run may clarify the relationship between foreign inflows and ISE returns. Our results indicate that even after adding relevant variables to the regression equations, foreign funds affect market returns.

D- Are foreign investors momentum traders in ISE?

This study also aims to test whether foreign flows act as momentum traders. To test this hypothesis, a month will be divided in to four weeks and each week's return will be analyzed to show evidence that whether foreign flows follow recent returns or not. Feedback Hypothesis is tested to determine the behavior of foreign investors. They may be positive feedback traders, chasing returns; they may be negative feedback traders, having contrarian strategies; or feedback trading hypothesis may be rejected in ISE for the period under study, meaning that recent returns do not determine the following trades of foreign investors. Our results indicate clearly that foreign funds chase prior returns suggesting a constant mix strategy.

5.1. Interpretation of Test Results

It is expected to find a significant relation between the inflow of foreign funds and market returns, -Base Broadening- obviously leads to lower risks levels and consequently higher security prices but the significance of the relationship between them may depend on other factors as well. The other factors will be factored in the equation when testing Omitted Variables Hypothesis and it is expected to find lower significance between them once these additional variables are added to the regression in the Omitted Variables Hypothesis**.** Price pressure is an alternative hypothesis to base broadening and the null hypothesis that there is no price pressure in the market is to be tested. It is expected that there is no price pressure in the market as there is no significant increase in both TNS and MSF values for foreign funds in the sample period. If there is so called price pressure, the TNS and MSF values should be greater for foreigners as there is a net inflow of foreign funds in the sample period (see Table 1) besides, both contemporaneous values of TNS and

MSF and the lagged values of TNS and MSF do not Granger cause returns in the findings of this study.

5.1.1. Testing of Base Broadening Hypothesis

In this study, base broadening hypothesis is tested by using a similar regression model as Clark & Berko (1996). They have used Net Foreign Portfolio Inflow (NFPI) as the independent variable which is calculated as the percentage of capitalization. One of the regression models that is used in this thesis for base broadening hypothesis uses changes in the foreign holdings in ISE as a percentage of market capitalization and the other model utilizes foreign participation as a percentage of the total number of stocks.

The two models are presented here below :

$$Return_t = \beta_0 + \beta_1 MSF_t + e \quad (1)$$

In the model 1, MSF is equal to market share of foreigners and $Return_t$ is equal to the monthly returns of IMKB 30. The number of observation is equal to 42 which is composed of monthly returns of IMKB 30 and monthly changes in the foreign participation and the period studied is between 1 December 2005 and 1 June 2009.

The outcome of the regression is as follows:

Table 10. *Test of base broadening hypothesis according to MSF in ISE*

Source	SS	Df	MS			
Model	321054731	1	321054731			
Residual	720930192	40	18023254.8			
Total	1.0420e+09	41	25414266.4			
$Return_t$	Coef.	St. error	T-value	p>t	(95%Conf.	Interval)
MSF_t	24.26612	.749465	4.22***	0.000	12.64602	35.88623
Constant	-115017.2	39369.01	-2.92***	0.006	-194585	-35449.5
Number of observation						42
F(1,40)						17.81
Prob>F						0.0001
R-Squared						0.3081
Adjusted R-Squared						0.2908
Root MSE (4245.4)			rho			.8432521
DW statistic (original) (0.315533)			DW statistic (transformed)			1.805987

*** Significant at 1 % ** significant at 5 % * significant at 10 %

Using Breusch-Pagan / Cook-Weisberg test for heteroskedasticity; Prais-Winsten AR(1) regression combined with Cochrane-Orcutt AR(1) regression for autocorrelation; variance inflation factor (<10) and some independent variables are omitted when necessary to overcome multicollinearity

The change in the foreign participation in ISE explains 30.81 % of the change in the return of IMKB 100 and the t value is equal to 4.22 and it is statistically significant at % 1 significance level. The coefficient of 24.26 is highly material and supports the base broadening hypothesis. The constant term is significant and negative which may be interpreted as a support for base broadening as well because when there is neutral effect of foreign participation, there is a downward pressure in the market. Prais-Winsten and Cochrane-Orcutt algorithms are used to transform the regression equation in order to remove the autocorrelation

$$Return_t = \beta_0 + \beta_1 TNS_t + e \quad (2)$$

In the model 2, TNS is equal to foreign participation according to the total number of shares in ISE. $Return_t$ is equal to the monthly returns of IMKB 30. The number of observation is equal to 42 which is composed of monthly returns of IMKB 30 and monthly changes in the foreign participation and the period studied is between 1 December 2005 and 1 June 2009.

Strong relation between foreign participation and market return may be attributable to risk sharing and decreased cost of equity. It may be stated that foreign participation leads to permanent increases in the prices of securities in ISE. Foreign Fund managers may be better 'Informed traders' and this suggestion may be another reason for the increase in the prices. Even though, there may be other reasons for the permanent increase in security prices, it has to be kept in mind that there is an expected over estimation in effect of foreign participation in security prices when omitted variables are not factored in. Therefore, these results of base broadening have to be supported with the results of omitted variable hypothesis. The outcome of the regression is shown in Table 10 here below:

Table 11. *Test of base broadening hypothesis according to TNS in ISE*

Source	SS	Df	MS			
Model	255161527	1	255161527			
Residual	783597910	40	19589947.8			
Total	1.0388e+09	41	25335596			
$Return_t$	Coef.	St. error	T	p>t	(95% Conf. Interval)	
TNS_t	21.44033	5.94	3.61***	0.001	9.433646	33.447
Constant	-68231.76	33138.44	-2.06**	0.046	-135207	-1256.475
Number of observation						42
F(1,40)						13.03
Prob>F						0.0008
R-Squared						0.2456
Adjusted R-Squared						0.2268
DW statistic (original)		0.288894	DW statistic (transformed)			2.159265
Root MSE		44.261	Rho			.8541739

*** Significant at 1 % ** significant at 5 % * significant at 10 %

Using Breusch-Pagan / Cook-Weisberg test for heteroskedasticity; Prais-Winsten AR(1) regression combined with Cochrane-Orcutt AR(1) regression for autocorrelation; variance inflation factor (<10) and some independent variables are omitted when necessary to overcome multi collinearity

The change in the foreign participation in ISE according to number of shares explains 24.56 % of the change in the return of IMKB 100 and the t value is equal to 5.94 and it is statistically significant at 1 %. The coefficient of 21.44 is highly material and supports the base broadening hypothesis. Constant term is similarly negative and significant at 5 %.

The rationale behind the introduction of MSF_t and TNS_t as independent variables in model 1 and model 2 is the will to determine whether there is a difference in foreign participation according to MSF_t and TNS_t. In reality, foreign participation rate according to total number of shares may increase (decrease) even if in a day when foreign participation rate according to market capitalization remains the same or diminish. This may be due to the fall (rise) in the prices of securities they hold in their portfolios despite the contemporaneous inflow (outflow).

The sample used in this thesis, favors for the base broadening hypothesis when both MSF and TNS are used as an independent variable. This finding is consistent with the findings of earlier studies such as Adabag & Ornelas (2006) but approximately 26% of adjusted R squares by using both of our models are expected to be smoothened when the omitted variables are added to the model in omitted variables hypothesis.

5.1.2. Testing of Price Pressure Hypothesis

This study presents the effect of foreign funds to IMKB 30 but as Warther (1995) suspects these inflows may only be temporary, just to benefit from the illiquidity the market is facing and they may be ready to leave the market as soon as the prices rise to the levels where no illiquidity premium is no longer offered and incorporated into the prices. When these funds are temporary, it is reasonable to expect an outflow in the coming periods. It may be argued that these temporary funds may not be disruptive to the local markets as they don't increase the volatility in the market; Illiquidity premium may only cause the prices go more down, leading to an increase in the price range thus removing the illiquidity premium may only decrease price volatility.

If the temporary fund providing managers are assumed to be rational, they should be leaving the market with profits. If they are assumed to make profits then they should buy at lower prices where illiquidity premium is in place and they should be exiting the market with comparatively higher prices. In that case, rather than increasing the volatility, these funds may help to decrease the volatility even

after leaving the market. Their inflow and outflow from a market only generates an extra ordinary volume not volatility.

Our approach to test Price Pressure is similar to Clark & Berko (1996), Dahlquist & Robertsson (2004) and Adabag & Ornelas (2005). Six lags are used to clarify and strengthen the outcome of test results. The hypothesis and the model are as follows:

H_0 = there is no price pressure; $\beta_0 \leq 0$ $\beta_i = 0$, i=1 to n

Where the regression modals are:

$$Return_t = \beta_0 + \Sigma^n_{i=1} \alpha_i Return_{t-i} + \Sigma^n_{i=0} \beta_i TNS_{t-i} \quad (3)$$

$$Return_t = \beta_0 + \Sigma^n_{i=1} \alpha_i Return_{t-i} + \Sigma^n_{i=0} \beta_i MSF_{t-i} \quad (4)$$

The independent variable TNS is used in equation 3; the independent variable MSF is used in equation 4, to see if foreign participation rate according to total number of shares differ from foreign participation rate according to market share with market capitalization. The outcome of the regression (3) is shown in Table 11 here below:

Table 12. *Price Pressure - TNS*

	1	2	3	4	5	6
Variables	Return month t	Return month t	Return month t	Return month t	Return month t	Return month t
Constant	16556.54	14616.58	41404.38	38160.73	50416.61	30414.77
	(1.39)	(1.28)	(1.45)	(1.04)	(1.54)	(1.82)*
Return month t-1	.0778714	1599456	-.575366	-.635276	-.5270105	.0618514
	(0.43)	(0.83)	(-3.01)***	(-3.10)***	(-2.67)**	(0.32)
Return month t-2		-.0767485	-.2387965	-.3174042	-.2306241	-.0700278
		(-0.45)	(-1.06)	(-1.27)	(-0.97)	(-0.35)
Return month t-3			-.1100073	-.2150324	.0222881	.0103787
			(-0.56)	(-0.88)	(0.09)	(0.05)
Return month t-4				-.2324718	.1275025	.0743354
				(-1.21)	(0.52)	(0.37)
Return month t-5					.3176765	.2181579
					(1.57)	(1.14)
Return month t-6						-.3000028
						(-1.63)
TNS	7.673146	8.394353	4.656028	.6522016	1.117606	1.48359
	(0.98)	(1.05)	(0.65)	(0.09)	(0.15)	(0.24)
TNS t-1	-10.7121	-11.09225				
	(-1.34)	(-1.36)				
TNS t-2					-10.54485	-5.921999
					(-1.11)	(-0.73)
TNS t-3			-12.18484			
			(-1.58)			
TNS t-4				-7.626981		
				(-0.95)		

TNS t-5					.408151	
					(0.05)	
TNS t-6						-1.013662
						(-0.21)
Prob > F	0.1948	0.2039	0.0677	0.0761	0.1161	0.3930
BIC	807.7847	792.1293	775.6583	761.1838	742.534	723.114
AIC	801.0292	783.8115	765.8328	749.9074	728.2823	707.5605
Adjusted R2	0.0477	0.0568	0.1498	0.1613	0.1585	0.0277
DW statistic (original)	1.999011	2.064368	1.893285	1.976606	1.877762	2.131284
DW statistic (transformed)	2.042262	1.962744	1.981188	1.881051	2.109025	2.021953

*** Significant at 1 % ** significant at 5 % * significant at 10 %

Using Breusch-Pagan / Cook-Weisberg test for heteroskedasticity; Prais-Winsten AR(1) regression combined with Cochrane-Orcutt AR(1) regression for autocorrelation; variance inflation factor (<10) and some independent variables are omitted when necessary to overcome multi collinearity. The outcome of the regression (4) is shown in Table 12 here below:

Table 13. *Price Pressure-MSF*

Equation	1	2	3	4	5	6
Variables	Return month t	Return month t	Return month t	Return month t	Return month t	Return month t
Constant	37253.44 (1.36)	25783.52 (1.36)	66882.31 (1.43)	105333.6 (1.29)	83924.29 (1.31)	60203.96 (2.48)**
Return month t-1	-.2392914 (-1.28)	.3034656 (1.52)	-.4964174 (-2.47)**	-.6953314 (-3.21)***	-.5484232 (-2.80)**	.0921978 (0.51)
Return month t-2		-.095725 (-0.47)	-.1816839 (-0.83)	-.4007798 (-1.58)	-.2578265 (-1.10)	-.0580426 (-0.31)
Return month t-3			-.0728771 (-0.36)	-.2880291 (-1.14)	-.0564534 (-0.22)	-.1309724 (-0.63)
Return month t-4				-.223189 (-0.99)	.1334779 (0.53)	-.103684 (-0.50)
Return month t-5					.3379854 (1.61)	.1322985 (0.70)
Return month t-6						-.3708192 (-1.96)*
MSF	-4.58525 (-0.54)	-4.65507 (-0.51)	-4.787502 (-0.50)	-6.189489 (-0.60)	-7.763356 (-0.86)	-7.087396 (-1.07)
MSF t-1	-.9149779 (-0.10)	6.283231 (0.43)	1.951621 (0.19)	-.6524858 (-0.06)		
MSF t-2		-5.43186 (-0.56)	-.5671939 (-0.06)	-.371293 (-0.04)	-3.19627 (-0.31)	5.448694 (0.47)
MSF t-3			-6.432518 (-0.62)	-5.738402 (-0.46)	-8.510932 (-0.67)	7.844249 (0.63)

MSF t-4				-2.473958 (-0.20)		
MSF t-5					7.311598 (0.60)	
MSF t-6						-15.00431 (-1.88)*
Prob > F	0.2324	0.4093	0.1639	0.0676	0.0513	0.2704
Adjusted R2	0.0367	0.0056	0.1040	0.2136	0.2434	0.0886
DW (original)	1.961946	2.033379	1.923029	1.985008	1.893346	2.152308
DW(transf.)	2.018483	1.937169	1.967174	1.856355	2.039618	2.086101

*** Significant at 1 % ** significant at 5 % * significant at 10 %

Using Breusch-Pagan / Cook-Weisberg test for heteroskedasticity; Prais-Winsten AR(1) regression combined with Cochrane-Orcutt AR(1) regression for autocorrelation; variance inflation factor (<10) and some independent variables are omitted when necessary to overcome multicollinearity

This study provides expected results when the results are compared to other studies done in Turkish market. The study of Adabag & Ornelas (2005) and Baklacı (2009) both rejected the price pressure hypothesis. Adabag and Ornelas (2005; p. 11) , who used a data of ISE All Shares Index for the period February 1997 to September 2004, have found positive coefficients of lagged flows of foreigners none of them were significant other than fourth lag. On the contrary, Baklaci (2009) who has studied 20 stocks for the period between 1 Dec 2005 to 11 March 2008; claims that price pressure is present on some of the stocks examined.

This study found positive and insignificant coefficients for the contemporaneous TNS and the lags for TNS is negative except fifth lag but they are all insignificant. Therefore price pressure hypothesis is rejected. This study fails to reject the null hypothesis that there is no price pressure as none of the coefficients of lagged TNS and contemporaneous TNS are significantly different from zero even with a 10 % significance level.

Similarly, this study found negative and insignificant coefficients for the contemporaneous MSF and its lagged values up to six. The null hypothesis that there is no Price Pressure cannot be rejected as none of the coefficients of lagged values of MSF are significantly different from zero and none of the coefficients of lagged values of MSF are significantly different from zero.

However, as can be seen in the Table 8, there are various and an increasing number of foreign investors who have an open position in ISE. It can be argued that some of the foreign funds arrive to the market to exploit the illiquidity premium; this can be deducted from the positive coefficient of contemporaneous foreign inflow measured by TNS and negative but insignificant coefficients of lagged values of TNS. Foreign investors may arrive to the market with different

motivations and their behavior may weaken the price pressure in the market. Differentiation of foreign investors according to their strategies may better answer the question of whether there is price pressure in the market but that is beyond the scope of this thesis.

Regression results indicate that there is no significant price pressure but insignificant presence of price pressure may be possible. Regulators may be interested in the financial activities of foreign funds to clarify if any inappropriate profits are obtained by them or any disruption done to the reputation or robustness of the market.

Even though these concerns may have a valid basis, foreign investors do not act unanimously and they should not be seen as a single body; their strategies differ and may lead to differing outcomes for the robustness of the market but without assessing which group of foreign investors cause an adverse effect on the market, even if any harm is done to the market by foreign investors' transactions, they shouldn't be penalized as a group.

5.1.3. Testing of Omitted Variables Hypothesis

This thesis uses a similar regression equation of earlier studies other than the formation of vector Z_t, which represents the additional factors that explain the change in the dependent variable, change in return IMKB 30.

$$Return_t = \beta_0 + \Sigma^n_{i=1} \beta_i MSF_t + \beta Z_t \quad (5)$$

$$Return_t = \beta_0 + \Sigma^n_{i=1} \beta_i TNS_t + \beta Z_t \quad (6)$$

A vector of coefficients have been shown by β in the equation above whereas, a vector of additional independent variables are indicated by Z_t. S&P 500 returns, DAX returns and FTSE returns are added to the additional variables list as most of the foreign funds invest in these markets. These variables represent developed markets but correlation among themselves are very high as can be seen in the correlation matrix in the Appendices therefore only one of them is included in the equations due to multicollinearity concerns. Change in 10 year bond prices of United States has also been used as an independent variable to capture the effect of an alternative investment option rather than stocks for foreign investors. Similarly, XAU, Gold- silver futures in Philadelphia Exchange is added to the independent variable list and BOVESPA and Shanghai Composite is added to the independent variable list to catch any effect of other emerging markets. If omitted variables hypothesis is valid, and if this study correctly places the omitted variables to the equation above then, the R-square of Base broadening should be improved.

It has been stated and verified that both MSF and TNS have been significant in explaining the change in IMKB 30 returns in the Base Broadening Hypothesis part. The test results of base broadening with MSF had an adjusted R-squared of 29.08 %. Adjusted R-squared has been increased to 56.67 % with the inclusion of

independent variables of American Treasury 10 year bond rates, DAX, FTSE, S&P 500, BOVESPA, Shanghai Composite, Gold- silver futures, the increase in the adjusted R-squared increases the presence of multicollinearity concerns among independent variables and the correlation table in the appendices show that there is strong correlation among DAX, FTSE and S&P 500. Variance inflation factors of these variables are also very high therefore, to avoid multicollinearity, only one of the independent variables of DAX, FTSE and S&P 500 is kept in the following equations. As expected, whenever they are included in an equation, the change in these markets interchangeably or collectively explain the change in ISE significantly. A combination of independent variables has been selected to show evidence that these omitted variables increase the explaining power of the model when they are included. The aim here is to prove that the significance of explaining power of MSF may be over stated due to these neglected variables.

In the new models formed, the highest R-squared has been reached with the inclusion of independent variables of DAX, Shanghai Composite, BOVESPA, gold-silver futures and MSF (third equation) and the adjusted R-squared has decreased approximately 10 % from the first equation to 51.24 %. Our model doesn't have an aim to forecast but has an aim to diminish the significance of MSF on returns. The coefficients of MSF and t-value of 4.22 in Base Broadening Hypothesis test results has been decreased to a coefficient with a t-value of 2.32 (still significant at 5 %)

The test results of base broadening with TNS had an adjusted R-squared of 22.68%. Adjusted R-squared has been increased to 50.58% with the inclusion of independent variables of American Treasury 10 year bond rates, DAX, FTSE, S&P 500, BOVESPA, Shanghai Composite, Gold- silver futures, the increase in the adjusted R-squared increases the presence of multicollinearity concerns among independent variables as well and the correlation table in the appendices show that there is strong correlation among DAX, FTSE and S&P 500. Variance inflation factors of these variables are also very high therefore, to avoid multicollinearity, only one of the independent variables of DAX, FTSE and S&P 500 is kept in the following equations. As expected, whenever they are included in an equation, the change in these markets interchangeably or collectively explain the change in ISE significantly. A combination of independent variables has been selected to show evidence that these omitted variables increase the explaining power of the model when they are included. The aim here is to prove that the significance of explaining power of TNS may be over stated due to these neglected variables.

In the new models formed, the highest R-squared has been reached with the inclusion of independent variables of treasury rates, DAX, Shanghai Composite, and TNS and the adjusted R-squared has changed slightly from the first equation to

52.91 %. Our model doesn't have an aim to forecast but has an aim to diminish the significance of TNS on returns. The coefficients of TNS and t-value of 3.61 have been decreased to a coefficient with a t-value of 1.27. Interestingly, in equations where there is no European Index is included; TNS is always significant but in the above mentioned second equation, insignificant coefficient of TNS have been reached. The results support the omitted variable hypothesis that factors other than TNS reduce the explanatory power and significance of TNS substantially and increase the explanatory power of the model.

When we look at the omitted variables hypothesis test results, the negative coefficient of American Treasury bonds for 10 years is as expected and it is consistent with previous studies. The bonds have weak explanatory power in IMKB 30 returns but the explanatory power increases when European Market returns are excluded. BOVESPA, Shanghai Composite, and Gold Silver futures have weak contribution to the model. As a result, Especially with TNS, Base Broadening Hypothesis is weakened with lower TNS t-values and higher adjusted R- squared figures achieved. With MSF values, Base broadening hypothesis is weakened with the same rationale mentioned above.

5.1.4. Testing of Feedback Hypothesis

In this thesis, feedback hypothesis is tested with the second approach mentioned in part 5.2.4 because the argument of Clark & Berko (1996) about the feedback horizon is reasonable as there may be feedback horizons for longer periods than the lags used in the regressions[11].

The regressions used to test feedback hypothesis are as follows:

$$TNS_t = \alpha + \beta_1 w4r_t + \beta_2 w3r_t + \beta_3 w2r_t + \beta_4 w1r_t + \beta_5 w4r_{t-1} + \beta_6 w3r_{t-1} + \varepsilon \quad (7)$$

Where rwi_j is the weekly return of the week i of the month j.

H_0: $\beta_1, \beta 2, \beta_3, \beta_4, \beta_5, \beta_6, = 0$

$$MSF_t = \alpha + \beta_1 w4r_t + \beta_2 w3r_t + \beta_3 w2r_t + \beta_4 w1r_t + \beta_5 w4r_{t-1} + \beta_6 w3r_{t-1} + \varepsilon \quad (8)$$

Where rwi_j is the weekly return of the week i of the month j.

H_0: $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, = 0$

When β_1 and β_2 are less significant than the rest of the coefficients, feedback hypothesis is rejected. It is expected to observe positive and significant coefficients for previous weeks and the subsequent first and second weeks when there is positive feedback because the positive feedback hypothesis claims that investors invest upon information they have gathered from past weeks, they want to trade with the momentum of the previous week. The results of the equation (7) are shown on Tables 13 here below:

[11] Clark & Berko (1996) argued that when there is a mismatch between the feedback horizons of investors and researchers, robustness of the outcomes may be adversely affected from these mismatch

Table 14. *Feedback Hypothesis (TNS)*

TNS	Coefficient	Std. error	t value	p> t
Constant	5507.566	430.6816	12.79***	0.000
wk4 return	-.0016673	.001105	-1.51	0.133
wk3 return	-.0021543	.0014938	-1.44	0.151
wk2 return	-.0041399	.001603	-2.58**	0.011
wk1 return	-.0010453	.0015969	-0.65	0.515
wk-1 return	.00331	.0014818	2.23**	0.027
wk-2 return	.0019871	.0010926	1.82*	0.071
R-squared	0.1399	Adjusted R-squared		0.1082
DW statistic (original)	0.026630	DW statistic (transformed)		1.488400

*** Significant at 1 % ** significant at 5 % * significant at 10 %

Using Breusch-Pagan / Cook-Weisberg test for heteroskedasticity; Prais-Winsten AR(1) regression combined with Cochrane-Orcutt AR(1) regression for autocorrelation; variance inflation factor (<10) and some independent variables are omitted when necessary to overcome multi collinearity

Our sample size is 170 which are weekly MSF values between the period 12.5.2005 and 1.06.2009 and they are regressed with the independent variables of weekly returns of IMKB 30 and lagged values of IMKB 30. The test results of feedback hypothesis with TNS measure supports positive feedback trading in ISE. The coefficient of week -1 return of ISE (t-value, 2.23) is positive and significant with 95 % confidence and coefficient of week-2 (t-value, 1.89) is also positive and significant but with 90 % confidence. Rest of the coefficients is negative but they are insignificant except for week 2 (t-value, 2.58) which is significant at 95 % confidence level. The signs of the coefficients indicate that foreign investors are momentum investors; they follow past returns and start closing their positions within the second week after their inflows. They continue to sell in the third and fourth week as well.

The results contradict with the results of Adabag & Ornelas (2005). They have rejected the feedback hypothesis in the market and showed evidence of the weak presence of negative feedback hypothesis. These differing outcomes may arise from the different periods used[12], both of the periods contained a global crisis, one in 2001 and one in 2008 therefore they are similar from that aspect. Another

[12] Adabag & Ornelas (2005) have studied the period of February 1997 to September 2004 whereas; this thesis has studied the period of December 2005 to June 2009.

explanation may be the different measures used in the regression equations[13]. Finally, foreign funds might have changed their investing style or the market conditions and expectations might have changed.

Anyone of these factors might explain the difference in outcomes but the results of this thesis indicate that foreign funds transact with momentum. Especially the recent week's return attracts foreign investors. The results of the equation (8) are shown on Tables 14 here below:

Table 15. *Feedback Hypothesis (MSF)*

MSF	Coefficient	Std. error	t value	p> t
Constant	6489.829	666.4104	9.74***	0.000
wk4 return	-.0023716	.001254	-1.89*	0.060
wk3 return	-.0021789	.0016953	-1.29	0.201
wk2 return	-.0022482	.0018193	-1.24	0.218
wk1 return	.0046424	.0018125	2.56**	0.011
wk-1 return	.0072044	.0016	4.28***	0.000
wk-2 return	.0072044	.00124	2.46**	0.015
R-squared	0.2068	Adjusted R-squared		0.1776
DW statistic (original)	0.041457	DW statistic (transformed)		1.851518

*** Significant at 1 % ** significant at 5 % * significant at 10 %

Using Breusch-Pagan / Cook-Weisberg test for heteroskedasticity; Prais-Winsten AR(1) regression combined with Cochrane-Orcutt AR(1) regression for autocorrelation; variance inflation factor (<10) and some independent variables are omitted when necessary to overcome multi collinearity

Our sample size is 170 which are weekly MSF values between the period 12.5.2005 and 1.06.2009 and they are regressed with the independent variables of weekly returns of IMKB 30 and lagged values of IMKB 30. The test results of feedback hypothesis with MSF measure clearly favors for positive feedback in ISE as well. The coefficient of week 1 return of ISE (t-value, 2.56) and coefficient of the week -2 (t-value, 2.46) are both positive and significant with 95 % confidence. The coefficient of week -1 is also positive as but this time the significance level increases to 99 %, the rest of the coefficients is insignificant other than week4 (t-value, -1.89) which is interesting because the coefficients of w2, w3 and w4 are all negative. It can be inferred that foreign investors follow past returns and sell in the

[13] Adabag & Ornelas (2005) have used NFPI as a measure that controls foreign funds effect and they have used ISE all shares Index as a proxy for market return.

weeks that come after their purchases. MSF measure and IMKB 30 weekly returns strongly supports the positive feedback hypothesis.

When pursuing positive feedback trading, it is needed to obtain positive and significant coefficients of previous week's returns and their coefficients have to be more significant than the coefficients of week 4 or week 3. When both TNS and MSF measure is used, the signs and significance of coefficients are as expected and strongly support the positive feedback trading in ISE in the period under study.

This thesis reminds that there are differing types of investors in ISE; some are momentum investors, who do not necessarily trade in herds, and some investors are trading according to the value; they believe the security is underpriced and wait till it reaches to its intrinsic value.

In an investment environment where two opposite strategies fight against each other, intuitively, it may be argued that even if there is a positive or negative feedback trading in ISE, the offsetting feature of the counterpart strategy should be taken into consideration when stating whether there is positive feedback trading in ISE or not. In markets where feedback trading is significant, it can be inferred that information value is higher because funds chase high returns of the previous periods.

Conversely, it can be argued that if feedback trading is insignificant, recent information on prices of securities is less valuable. This kind of inference may be invalid because investment volume of foreign funds and number of foreign investors increase by time, which means that number of momentum and value traders increase as well.

As the number of investors grow, it is theoretically harder to claim the investors are trading in herds rather they have opposing views about the direction of the market and/or stocks individually. That's why if there is positive feedback trading in a market it doesn't necessarily mean that there are more momentum traders than value traders but the volume of momentum traders may be more than the volume of value traders thus their impact may be more.

In other words, In markets like ISE, where the market is not as deep as other developed markets, the outcome of the regressions run may indicate positive or negative feedback trading or reject feedback trading as is in the study of Adabag & Ornelas (2005).

Any of these results may be despite the majority of the investor's trading behavior. For instance, most of the traders may be momentum traders but only the largest two may follow contrarian strategies and if the market depth allows the two large funds to impose their strategy, one who tries to assess the market on feedback trading may get distorted results.

To mitigate the distortion mentioned above, the measure, TNS, may be used because positive feedback traders purchase securities in order to in the short term; they want to benefit from the momentum of the security they involve in. In that case, after the position is closed, there shouldn't be any change in the TNS measure and that is just the case in the period and in the market that has been studied. Foreign funds that seek positive feedback pursue profits as long as their feedback horizon and leave the risk and the remaining capital gains to value investors in ISE.

5.2.Interpretation of Test Results of Each Hypothesis by Excluding the Global Crisis of 2008 from the Sample Period

Presence of a crisis in a sample period may increase concerns about the validity and reliability of the test results obtained. Therefore, for robustness purposes, the sample period has been shortened by 9 months in which the global crisis of 2008 prevails. It is assumed that volatility and price fluctuations increase in this period and by removing the problematic period from our sample period, test results with different t-values are achieved. The comparison of test results of two different periods is believed to strengthen the results of this study. Comparisons of the results of two different periods of each hypothesis mentioned in this section are discussed here below:

Base Broadening hypothesis' test results were positive significant MSF and TNS values with t- values of 4.22 and 3.61 respectively when a sample period of 42 months is used. They were both significant at 1 %. When the sample period is shortened, the significance of both MSF and TNS diminished. In the Table 10 and Table 11 in the appendix section, it is presented that T value of MSF has diminished slightly to 3.10; still significant at 1 %. T value of TNS has diminished to 1.80, still significant but at 10 % which is acceptable as the number of observations (N) in the calculation of standard error has been decreased to 33 months which increases the standard error and consequently change in N may decrease t values. Despite the decreases in the significance of TNS and MSF, it is still clear that both of the measures explain the change in IMKB return significantly.

When the existence of price pressure arising from influx of foreign funds is tested, this study found positive and insignificant coefficients for the contemporaneous TNS and the lags for TNS is negative except fifth lag but they are all insignificant. Therefore price pressure hypothesis is rejected. This study fails to reject the null hypothesis that there is no price pressure as none of the coefficients of lagged TNS and contemporaneous TNS are significantly different from zero with a 10 % significance level. Similarly, no price pressure is detected when MSF measure is used when 42 months have been used as a sample period.

Unexpectedly, when the sample period is shortened to 33 months, most of the contemporaneous and lagged values of both MSF and TNS become significant. Therefore price pressure hypothesis cannot be rejected when the sample period excludes the crisis period. When the TNS measure is used, contemporaneous TNS measures are both positive and significant up to five lags and negative and significant coefficients are observed for its lagged values when 1, 2, 3, 4 lags are used as can be seen in Table 16 in the Appendices; it is clear that when the crisis period is excluded, price pressure exists in ISE with TNS measures as contemporaneous TNSs are positive and significant whereas, lagged values are negative and significant. When the MSF measure is used, contemporaneous MSF measures are both positive and significant up to six lags and negative and significant coefficients are observed for its lagged values when 1, 2, 3, 4 lags are used as can be seen in Table 17 in the Appendices; it is clear that when the crisis period is excluded, price pressure exists in ISE with MSF measures as contemporaneous MSFs are positive and significant whereas, lagged values are negative and significant.

The different outcome acquired from different sample periods may indicate that there is price pressure in ISE in normal times but the price pressure arising from foreign funds loses its effectiveness during crisis times. In that case, it may be concluded that significant portion of foreign funds arrive ISE for near term goals and their intention is to leave the market with profits within a few months period. This intention may be subject to taxation and regulatory measures may be taken.

When the crisis period is excluded from the sample period, the t-values of the independent variables have diminished apparently in Table 14 and Table 15 of the Appendix. When TNS measure is incorporated to the equations, half of the TNS had significant t-values (at 10 %) but the other half had no significance at 10 % significance level which clearly weakens the base broadening hypothesis more as expected When compared with the earlier results of original sample, every independent variable, despite lower significance, had similar explanatory powers except the interesting result obtained from the equation 2 in table 14 in the Appendix. DAX, FTSE and S&P 500 had strong influence on returns in all the equations run other than this one; in this equation FTSE had an insignificant effect on the return. When MSF measure replaces TNS measure and crisis period is excluded no interesting results is achieved but equations with MSF had almost similar significance levels with the figures obtained from the larger sample. The slight decreases in the t-values may arise from the decrease in number of observations (N).

Shanghai Composite had a significant coefficient in the first equation with MSF but that is negligible as all tables of omitted variable hypothesis had

problematic first equations as there is inherent multicollinearity concern in these first equations due to high correlations among independent variables.

When the sample period is shortened to 33 months to exclude the crisis period, positive feedback trading claim stated in this thesis has gained robustness. Similar positive feedback trading evidences are present when the crisis period is excluded with TNS measure; week -1 and week -2 have positive coefficients which may be interpreted as purchases of foreign funds but only week -1 has a significant coefficient as can be seen in table 13 in appendix. Week 1, week 2, week 3 and week 4 have negative coefficients which may be interpreted as foreign funds' selling. Positive feedback trading evidences are also present when the crisis period is excluded with MSF measure; as it is with the larger sample; week -1, week -2 and week 1 have positive coefficients whereas, week 2, week 3 and week 4 have negative coefficients. Table 12 in the Appendices shows that positive feedback trading with MSF measure doesn't deviate much from the positive feedback trading present in Table 14 where 42 months are used as number of observations. However, the significance of coefficients decreases, especially week -2 does no longer have a significant coefficient when the crisis period is excluded. It may be inferred that positive feedback trading is stronger in the crisis period.

How the Granger causality relationship between foreign flows and IMKB 30 return, vice versa, would be affected when the crisis period was to be excluded is also questioned. TNS granger causes returns when two lags and six lags are used whereas IMKB 30 returns granger causes TNS when one, two, three and four lags are used. Foreign inflows are influenced from previous month's returns more than returns are influenced from foreign inflows and results are given on the Table 8 and Table 9 in which the crisis period is excluded. There is no major change in the outcomes of causality analysis when the crisis period is excluded from the sample period for each of the measures used.

Conclusion

This study addresses the relation of returns of IMKB 30 index and change in foreign participation which is substantiated with two measures; TNS and MSF. While foreign investors are increasing their dominance in ISE, whether they are having a significant impact on prices or not, is questioned and interesting results are obtained. For the sample term, this study rejects price pressure hypothesis and claims that foreign fund managers gauge the liquidity levels of ISE well and send their market orders without distorting price levels in general and therefore, the liquidity of the market is adequate to maintain the price levels when the market faces foreign order flows. This is in line with the previous studies' findings that find no price pressure of foreign funds on security prices and it has to be kept in mind that the period under study covers the global crisis of 2008 and the presence of the crisis in our sample contributed to the robustness of the findings of the study in two ways; first, during the crisis, liquidity shocks are received by the market, liquidity levels were relatively lower when the sell orders jam, but still, no evidence of price pressure is found. Secondly, sample term contains several huge rallies and crashes; price reversals occurred after the severe contraction of prices due the crisis and this investment environment was suitable to test price pressure hypothesis as it had temporary illiquidity it needs due to the uncertainty perceived by the majority

of investors. Despite the present, known illiquidity and inflow of foreign funds have occurred, no price pressure could be verified. But it is a fact that ISE is not as deep as the major markets in the world. In that respect, it may be inferred that when foreign funds send a buy order for ISE 30 shares, they send their orders to their broker as `go with the market`. They may refrain from sending orders that will probably distort prices and increase their costs.

However, when the sample period is tailored and the crisis period is excluded, this study fails to reject the null hypothesis that there is no price pressure in the market. This thesis provides evidence that foreign funds cause price pressure only when the crisis period of global crisis 2008 is excluded in ISE and results obtained are in line with some other emerging market studies, Froot et al, (2001, Table 9) show evidence that average impact of foreign funds for emerging markets is 39 %; which is so high but in any case, it is a bold fact that Foreign Funds became more dominant in ISE in the last decade compared to the previous ones. The significant price pressure caused by foreign investors in normal times may indicate that Foreign funds may be reluctant to 'play pressure games' when there is increased risk otherwise, they are eager to earn excess profits by driving up the prices in the short term and exiting the market when the temporary illiquidity is gone. Regulatory bodies try to avoid foreign funds from selling their securities heavily in order to prevent markets from crashes. It is clear from the Participation Rates of Foreign Investors that they didn't sell their securities in a devastating manner in ISE in the sample period as both rates have not deviated much from their mean values despite the crisis. It can be inferred that, in normal times, significant price pressures and stable participation rates evidenced in this thesis may indicate that foreign funds repatriate their excess profits and pursuing a constant mix strategy rather than pursuing a constant proportion strategy in ISE, otherwise we would expect increasing participation rates on behalf of foreigner investors. These excess profits may be subject to taxation in the near term; SPK may elect to remain foreign transactions untaxed but may charge a fee or a commission on money transfers to other countries. This may enable funds to remain in the market. The downside of this recommendation is that foreign funds may probably be uncomfortable with this and they may try to be punitive too and they may start leaving the market or decrease their weights in ISE but this chance is remote as no tax environment in ISE is not the sole factor that attracts foreign funds to ISE; As long as the market offers promising economic development and growth rates, foreign funds may continue to maintain, if not increase, their market shares in ISE. A second precaution may be the further reduction in tick sizes as it increases the cost of institutional trades which may be linked to foreign trades.

The findings of this thesis also displays evidence of positive feedback trading which contradicts with the findings of the recent studies that found negative or no feedback trading in ISE. So rather than pursuing a contrarian strategy, foreign investors are following momentum strategies when they invest in ISE.

It is obvious that initial foreign participation rate remained almost the same at the end of the sample period. The conclusion derived from this fact is that majority of non-domestic funds don't invest in long terms but they monitor information and transact according to recent returns. Their objectives seem to be reaping the profits in shorter terms which weakens the arguments of previous studies that foreign equity trading in beneficial to ISE. The earlier studies that showed evidence of negative feedback trading in ISE argued that negative feedback strategies smoothens volatility of the market thus they are beneficial to the market. However, from that aspect, non-domestic funds seem to exacerbate market volatility instead of smoothening it.

It doesn't necessarily mean that non-domestic funds are harmful to the market because of the reason mentioned above. This thesis supports base broadening hypothesis; The significant base broadening effect, which arises from the foreign inflows, helps the market in reducing risks and consequently, increasing the prices permanently; as long as foreign funds maintains their market participation rates. This is the absolute benefit of foreign funds to the market however; there will always be an outflow risk that has to be well monitored. When the crisis of 2008 is analyzed, disruptive outflows have not occurred; if it had occurred, the resilience of the market could be challenged but it has to be kept in mind that it doesn't mean that it will never occur. Outflow risk factor should be well monitored and it may be analyzed in another study by using different sample periods and markets that have such outflows in the past.

Another benefit of foreign funds is the fact that they mitigate temporary illiquidity and/or increasing liquidity level. Evidence of positive feedback trading and evidence of price pressure by foreign investors are presented in this study in normal times and it is common sense that new funds increase the liquidity level. Foreign funds look at recent data when they invest so when foreign funds arrive to the market, the liquidity level increases and prices increase due to the diminished liquidity risk and stocks become more attractive and this leads to further foreign inflows. The presence of a chain effect may be argued but stability of foreign participation rates reminds that the chain effect is not strong enough to cope with other factors influencing the decisions of investors for the sample period.

This study show evidences that both TNS and MSF measures explain the changes in IMKB 30 significantly and this is consistent, as the base broadens with the new inflows. However, a list of neglected variables is incorporated to our

regression analysis and they clearly reduce the explanatory power of both MSF and TNS. These variables include markets returns from Europe, USA and emerging markets, US treasury bonds and a derivative instrument representing gold and silver prices. The results indicate that ISE is heavily affected by European market returns and there is a weak negative relation between US treasury bonds and ISE 30 returns. Despite the inclusion of the neglected variables, both TNS and MSF are still significant, supporting the base broadening hypothesis.

Regarding with the causality analysis, there is no evidence of granger causality from foreign flows towards IMKB30 returns but there is evidence for the reverse. It is apparent that IMKB30 returns granger causes foreign flows. These results are in line with our findings of positive feedback trading in ISE. Foreign funds eye previous month's returns and take investment decisions accordingly. For robustness purposes, instantaneous granger causality analysis is made which incorporates contemporaneous month's returns in the equations. There is no evidence of causality between foreign flows and contemporaneous month's return or vice versa but instantaneous granger causality analysis also supports the findings of causality between TNS and previous month's return.

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