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THE AMERICAN  
UNIVERSITY IN CAIRO

SCHOOL OF  
**BUSINESS**

The American University in Cairo

School of Business

**Investor Trading Behavior: Empirical Evidence from the Egyptian  
Stock Exchange**

A Thesis Submitted to  
The Department of Management

in partial fulfillment of the requirements for  
the degree of Master of Science in Finance

By

HEBA MOHAMED KHALIL

Under the supervision of  
Dr. ALIAA BASSIOUNY

May/2015

The American University in Cairo

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Second, none of this would have happened without the care and motivation of my mother. I would not have had the confidence to go through with this if it wasn't for my mom believing in me.

## **ABSTRACT**

Using unique, intraday transactions data from Egypt, this study examines the extent to which past returns, over several intervals going back to up to six months of past returns, and the level of sophistication of the different investor types, determine the propensity of different investor groups to buy and sell. I adopted the buy ratio differences method to determine which investors adopt a momentum behavior and which investors adopt a contrarian behavior. I find that non-Arab foreign investors tend to be momentum investors, buying past winning stocks and selling past losers while domestic investors, especially individual investors, tend to exhibit contrarianism. The distinctions in behavior are, to a great extent, consistent across the five different past-return intervals.

Keywords: Investor behavior; Momentum; Contrarian; Past returns;

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## CHAPTER I

### INTRODUCTION

Empirical evidence has recently urged the development of what is known as behavioral finance. It is the psychological area of the much structured trading world. Theories about the way investors approach and deal with the different market variables such as lack of information, past returns, earnings announcements and shocks in the market, for example, are used to explain the psychology behind the trading behavior of the different investors.

The different trading behaviors that have been identified so far are momentum trading, which also adopts a trend chasing strategy, contrarian trading, known as negative feedback trading and herding. Momentum trading is a strategy, used interchangeably with positive feedback trading, defined as a strategy where the investors try to capitalize on a certain trend in the market. Momentum traders look for “acceleration” in a stock’s price, earnings or revenues. They trade in stocks that seem to be strongly moving in one direction on high volume, relying more on movements in prices or on past performance of stocks rather than fundamental of the companies. Kim and Wei (2006) define the positive feedback trading as the strategy “with which an investor buys past winners and sells past losers... Positive feedback trading could destabilize the market by moving asset prices away from the fundamentals”. However, the same can be said about contrarian trading strategy which “does the reverse: buying past losers and selling past winners” (Kim and Wei, 2006) which also might depend on extrapolative expectations moving the

stock prices from the fundamentals. Grinblatt and Keloharju (2000) find that households seem to have a tendency to sell winners and hold onto losers making them contrarians along with government and nonprofit institutional investors. On the other hand, nonfinancial corporations and finance and insurance institutions that are the more sophisticated investor, with better access to information, are more of momentum investors. Furthermore, the volatility of the past returns does not seem to affect the tendency of contrarian investors to sell. They act more on positive past returns than on negative past returns by selling and cashing in on the winners while purchasing the loser with the belief that they cannot go any lower.

Several studies about the investment behavior of investors have been conducted on developed markets as well as emerging markets. Nonetheless, “EEMENA (Eastern Europe, Middle East, North Africa) region has been surprisingly neglected in this literature; despite it hosts those emerging economies that are most dependent on foreign capital inflows” (Ulku and Ikizlerli, 2012).

This paper focuses on the trading behavior of investors in one of the oldest Arab economies, the Egyptian Stock Exchange. Unlike some of the studies in the literature, the data used is high frequency transactions dataset during the period from 2004-2009, that classifies investors according to their origin; being domestic, Arab, non-Arab foreigners and also according to their type; being individual or institutional. This classification of the investors adds depth and allows for better understanding of the dynamics of the investors in the market. The addition of Arab investors as an investor category helps differentiate between the behavior of foreigners who yet share somewhat common culture, geography and language with the domestic investors, but however are still

foreigners. In other words, it is a beneficial addition that pinpoints the differences in the trading behavior that can be attributed to factors other than past returns (Grinblatt & Keloharju, 2001). Using this data, six-month past returns are calculated to rank the stocks as past winners and past losers over five different time intervals within the six months and hence examine which investor groups exhibit contrarian investment strategy and which investor groups are momentum investors through calculating the difference in buy ratios between the past winner and past loser stocks. We find that domestic investors, especially individual investors, adopt a contrarian investment behavior while foreign investors adopt a momentum investment behavior.

The rest of the paper is organized as follows. Section 2 will present the literature review of the main studies of investor behavior and the other factors that affect and are affected by such behaviors. Section 3 will present the sample market and data. Section 4 will present the methodology used in this paper. Finally, Section 5 will provide the results of this empirical study and the conclusion with areas for future research.

## CHAPTER II

### **Literature Review**

The purpose of this thesis is to examine the trading behavior of investors groups on the Egyptian stock exchange. This research question falls within a large body of literature that explores the dynamics of international equity investments in emerging markets.

This chapter summarizes and critically reviews the literature on international investments focusing on the asset allocation decision of investor groups, their trading behavior and strategies as well as their performance. I also briefly discuss the effect of such trading on emerging markets.

This chapter is organized as follows. In the first section I introduce and define two factors that affect the investment strategy of investor groups. The first is asset allocation that discusses how portfolio flows are affected by home bias and information asymmetry. The second is the trading behavior. Section II presents the trading performance and section III presents the effect on stock market with regards to liquidity, volatility and ownership. I finally focus in section IV on the contribution of this thesis and the gap it fills.

## *2.1. Section I: Investment Strategy*

### *2.1.1. Asset Allocation*

One important discussion that was the focus of most of the early studies on international investments involves understanding the motivation behind investor groups to engage in international equity investments. The main theoretical foundation of such a discussion involves home bias, which is interrelated with information asymmetry. One manifestation of information asymmetry is home bias, which is defined as the tendency of foreigners to trade and own more shares in their home country than in foreign markets despite the obvious benefits of diversification. In the study of Beugelsdijk and Frijns (2010), they examined the foreign bias in international asset allocation using country-level data based on underlying individual fund level data of mutual fund holdings of 26 well-developed countries investing in a broader sample of 48 countries where the rest are mainly emerging markets. This data was studied during the period of 1999-2000. They calculated the deviations from the optimal portfolio as described by asset pricing theory to measure the foreign bias and measure the uncertainty avoidance (UAV) and individualism (IND) using Hofstede's scores to measure culture and cultural difference. They showed that, "societies that are more uncertainty avoidant invest less in foreign equity and societies that are more individualistic invest more in foreign equity" (Beugelsdijk and Frijns, 2010). Moreover, they showed that the more culturally distant two countries are, the less they invest in each other, affecting how they decide on the destination of their investment flows.

In another study, Konukoglu (2010) found that, in the Turkish stock market during the period between January 1997 and June 2008, foreigners tend to trade and own more shares in their home country than in foreign markets although the diversification can be very profitable for them. He contributed the reason to foreigners having poor information in these markets, which leads them to, “on average... sell at lower prices compared to their buys”, (Konukoglu, 2010) which leads them to go for the larger, more liquid stocks, with lower foreign exchange risk and higher levels of financial incorporation. A possible explanation for the trading behavior of different types of traders in the market is information asymmetry, which is defined as the differences amongst investors with regards to collection and processing of information on international investments. It is argued that investors that have superior information compared to other traders in the market have the advantage of this information in trading in order to make profits.

In the context of international equity investments, previous studies from various markets show that domestic investors are better informed than their foreign counterparts as, on average, local investors are better informed on the payoff structure of local securities than foreign investors.

I summarize the main findings of such studies as follows. According to Chan, Menkveld and Yang (2007), “the Chinese market domestic investors have an information advantage over foreign investors where they either act on the information faster than the foreigners do, or have superior private information”. Their sample was composed of the intraday returns and order flows; basically all transaction data for A- and B- shares of 76 listed companies from January 2000 until November 2001 and these are divided into two sub-periods where one was for the time before February 19, 2001 and the other period after



February 19, 2001. The reason for their division of periods was that before February 19, 2001, A-share market was for domestic investors alone and the B-share market was for foreign investors alone but after that period, the domestic investors were allowed to trade in the B-share market. This data helped them analyze the information asymmetry in a more focused light. Evidence from Taiwan supports this public opinion in a study conducted by Tsai (2013) using transaction and limit order book data of all trades as well as annual earnings announcements of firms listed on the Taiwan stock Exchange from January 2005 until December 2006, computing the daily dollar profits, net of market gains, for each order category. Institutional domestic investors have information advantage over foreign investors and so they use their short-lived private information to “use large-sized orders with competitive prices to take up all of the available liquidity which shows the superior information they have regarding local annual earnings announcements which helps them better select stocks” (Tsai, 2013).

One proven cause of information asymmetry is the poor corporate governance, disclosure regulations and low minority and investor protection, especially in the firms with more ownership concentration where family holds the majority of shares. This is summarized in the following study. Leuz, Lins and Warnock (2008) assessed whether and why concerns about corporate governance result in fewer foreign holdings. They studied the comprehensive security-level data on foreign holdings by U.S. investors in 4,409 firms from 29 countries, which included ownership and control structure data for Western Europe from 1996 to 1999 and for emerging market and Japanese firms during the years 1995 and 1996. To test such a theory, they constructed nominal and relative proxies to show the extent to which managers and their families are in control of firms and then

repeat the same process with firm-level earnings management proxies and present an interaction between earnings management and insider control to partition the sample into cases where insider control is more likely to be a problem and cases where insider control is more likely to be benign. Their results showed that foreign investment becomes lower in the firms that have more insider control over earnings management in the countries where there are poor disclosure regulations and low investor protection. According to Leuz, Lins and Warnock (2008), “Stringent disclosure requirements make it less costly to become informed about potential governance problems. They level the playing field among investors making it less likely that locals have an information advantage. Strongly enforced minority shareholder protection reduces the consumption of private control benefits and thus decreases the importance of information regarding these private benefits. In contrast, low disclosure requirements and weak investor protection exacerbate information problems and their consequences”.

Despite the predominance of the evidence that show that domestic investors are better informed, some studies find that this is not consistent across the different investor groups, rather across the market overall. Taechapiroontong and Suecharoenkit (2008) used intraday transactions of 530 stocks in Thailand from January 1999 until December 2004. They supported the view that domestic investors have information advantage over foreign investors showing that, “domestic investors purchase at lower prices than foreigners and sell for more than the average price while domestic institutions and foreign investors sell at lower than the average price with foreign investors selling at prices even lower than domestic institutions. The latter suggests information asymmetry where domestic investors have information advantage” (Taechapiroontong and

Suecharoenkit, 2008). However, their study showed that foreign investors are at a disadvantage during the bear market and when they are on the sell side during a bull market and they trade mid-cap and large stocks at better price than individual and institution domestic investors when purchasing during the bull market. When it comes to the individual and institution domestic investors, institutions purchase at a better price than individuals during a bull market, “which means that institutional investors are more informed in this case and are being paid a higher premium by individual investors It is suggested that the reasons for such information asymmetry are linguistic, cultural or geographic consistent with results of earlier work of other Asia countries such as Korea and Indonesia.” (Taecharoontong and Suecharoenkit, 2008).

Another study that was concluded by Dvorak (2006) find that although the domestic investors have an information advantage; foreign investors have information due to their experience and expertise showing that information asymmetry favoring one investor type from the other could be due to greater skills of processing macroeconomics information, faster action taken in the market and higher trading abilities and skills.

A study that emphasizes the latter is one done on the market in Thailand as Phansatan et al. (2012) showed that foreign investors seem to have macro, market timing, informational advantages but no micro informational advantages over local investors when it comes to security selection that explains why “many studies can find that foreign investors have informational advantages in numerous markets (presumably where macro, market timing information is important), but not in other emerging markets where local investors might have superior security selection information” (Phansatan et al., 2012).

Proprietary traders can have good firm-specific information through their dealings with companies making them information-based investors.

Despite the several studies that prove foreign investors are at information disadvantage when trading in the local market, there are several other studies that counter that view claiming that extant research described foreign investors as “uninformed positive feedback traders”, which has been used as a justification for the argument that foreign portfolio flows may destabilize emerging markets given their size. The following summarizes some views that previous findings that foreign investors are uninformed positive feedback traders may be premature. Aragon, Bildik and Deniz (2007) used the trading history of all stocks listed in the Istanbul Stock Exchange; initial stock holdings of all individuals and institutions for the daily portfolio returns for each investor group from January 1999 until April 2003, given that most institutional investors in the market are foreign investors. They compared the portfolio returns of each investor group with a benchmark portfolio that has the same exposure to local market, size, and book-to-market factors. Moreover, they decomposed total performance into stock selection and market timing ability relative to the ISE Index. They showed that there is no information asymmetry between institutions and individuals and no local informational advantage to the individual investors.

Another study by Ahn et al. (2010) examined whether trade size is related to information content and whether buy and sell transactions carry different information content. The paper discussed a different market being the options market and still found evidence of information asymmetry. They studied the intraday information about each order and trade on the KOPSI 200 options index that is composed of the 200 most representative stocks

of the Korea Exchange during the period from January to December 2002. The two models adopted to test their hypothesis are the size-dependent model (SDM) to estimate the magnitude of the information content of a trade and the dummy variable model (DVM) to singly estimate information included for buyer and seller initiated trades. Their results showed that the information asymmetry is in favor of the institutional investors and more specifically, the foreign investors who are associated with the greatest adverse selection costs.

In support to this contrary view, Ulku and Ikizlerli (2012) discussed in their study of the Istanbul Stock Exchange that foreign investors “are a heterogeneous group dominated by sophisticated investors who are able to rationally adjust their trading style according to market conditions and the amount of sentiment trading by local participants. They do not exhibit symptoms of uninformedness, which are underlying assumptions of models of international investor behavior. Rather, their response to local information is completed within the contemporaneous month, and in the following months they focus on rebalancing away from the host market.” (Ulku and Ikizlerli, 2012).

Another form of information that traders are believed might be utilizing in their trades is information cascade which is defined as a social aspect where investors would make decisions regarding their trades based on their observations of the behaviors of others in the market while they overlook the internal information signals that are against such actions.

However, one study conducted by Chiao, Hung and Lee (2011) in the Taiwanese stock market to address the trading behavior of institutions and whether such behavior can be

attributed to information cascades proved that the institutional trading on the Taiwanese stocks takes place due to their own decisions and not based on information cascade. They had 229,353 firm-day observations from daily and intraday data on original trades covering the entire stock trading in the period from September 2002 until May 2006.

Ghoul et al. (2013) took a different approach when measuring the information asymmetry. They examined the association between information asymmetry, which they proxy with geographic proximity, and firms' cost of equity capital using stock return data, financial statement data, state and country code for each of the non-financial firms' headquarters, data on analyst forecasts and latitude and longitude data (in order to measure distance for each firm) from 1993 until 2008 for six major financial markets. They used the data to see if information asymmetry affected investor perceptions that were measured by the ex-ante cost of equity capital implied in contemporaneous stock price and analyst forecast data. They also used an exogenous proxy to analyze the impact of information asymmetry on equity financing costs. Their results showed that a higher cost of capital is required when the firms are located outside of financial centers, which, according to them, matches the requirement of rational investors for more compensation when information asymmetry is high. Moreover, they showed that geographic proximity is important economically for equity pricing, "implying that firms located within 100 kilometers of the city center of the nearest of six major financial centers, or in their metropolitan statistical areas, enjoy equity financing costs that are seven basis points cheaper" (Ghoul et al., 2013).

While home bias and information asymmetry play a great role in understanding the reasons behind investors' decisions with regards to international investments, there are other aspects that affect the international flow of equity.

For example, Froot, O'Connell and Seasholes (2001) used the daily cross-border flows of 44 countries, 16 of which are developed and 28 are emerging markets during the period from 1994 until 1998. They examined the behavior of flows across countries, characterized the flow data by their persistence, examined the covariance of equity returns with cross-border flows and examined the conditional relationships between flows and returns. They found that there is high persistence in the international inflows and outflows and that international portfolio inflows are slightly positively correlated across countries and even stronger within regions. They showed that there is a co-movement between returns and flows because the returns carry information by predicting future flows.

In another study that relates future returns with flows, Samarkoon (2009) showed that when it comes to returns and past flows, purchases of domestic institutional and foreign individual investors are strongly positively related with future returns while buy trades of domestic individual investors are strongly negatively correlated with future returns. While there is no correlation between future returns and institutional foreign investors trades.

In the Turkish market, Diyarbakirlioglu (2011) investigated the monthly equity-level transactions issued by foreign investors of 84 firms traded in the Istanbul Stock Exchange from January 1997 until December 2008 in an attempt to analyze foreign investors'

portfolio trading patterns in an emerging stock market. He carried out a regression to test whether the foreign investors' decision to trade a particular stock can be explained by the corresponding characteristics of the firm as well as conducting a time-series cross-section specification. The equity flow of foreigners, as per this paper, are a result of the following: the bigger the firm, the greater the familiarity of the investors with it as it is easier to know more about this company and the more the investors are likely to trade in this stock. This paper proved that "opposed to the popular theory of international portfolio diversification that states that investors are better off investing in market portfolio of securities, foreign investors' capital flows go for the large capitalization stocks" (Diyarbakirlioglu, 2011). Furthermore, two important determinants of the foreigners' equity flows are the market capitalization of the firm in which they invest as well as the expected return on the stocks. Finally, the foreign investors can be trend-followers where there is a strongly high correlation between their net purchases and the returns of the market.

### *2.1.2. Trading Behavior*

Recently, there has been a move in the literature towards understanding the psychology behind the trading behavior of various types of investors. The trading behavior of different types of investors in the market follows their decisions of their portfolio investment flows. Each investor type behaves in a different manner, depending on whether they decide to invest only locally, in developed markets, in emerging markets or have a portfolio where they trade in all or some of the above-mentioned markets. The most common trading behaviors are momentum trading strategy, contrarian trading



strategy and herding. In the light of which type of traders follow which trading behavior; several studies in different markets argue that foreign investors tend to follow momentum trading strategy while individual domestic investors tend to be more contrarian with domestic institutions lying in between the two categories. A summary of these studies follows.

Grinblatt and Keloharju (2000) examined the extent of the effect of past returns in determining the tendency to buy and sell stocks. Their results showed that foreign investors are mainly momentum traders while domestic investors and more specifically, households, adopt a contrarian trading strategy, which is consistent along all the different horizons of past returns. The data obtained from the Finnish Central Securities Depository (FCSD) included each owner's stock exchange trades from December 27, 1994 until December 20, 1996 on the Helsinki Stock Exchange of 16 stocks. They argued that, "the most sophisticated players in the "financial markets in Finland are the foreign investors." (Grinblatt and Keloharju, 2000). Moreover, they observed a pattern where some institutional investors exhibit momentum trading and some adopt contrarian trading, which is attributed to the level of sophistication of the institutional investors. If they are more sophisticated, they tend to adopt a momentum trading strategy and if they are less sophisticated, they become contrarian traders.

In another study by Grinblatt and Keloharju (April 2001) they attempted to identify the determinants of buying and selling activity of domestic and foreigner individuals and institutions in the Finnish stock market. Using daily recordings of shareholdings and trades of virtually all Finnish investors, both retail and institutional in the period between December 1994 and January 1997, they applied a Logit regression to analyze separately

the sell versus hold decisions and the sell versus buy decision. Their regression proved a number of things. First, the more sophisticated investors do not give much weight to past returns when deciding to buy or sell, unlike the less sophisticated investors such as the households, general government, and nonprofit institutions who look at past returns and are more predisposed to sell than to buy stocks with large past returns. Second, investors' tendency to sell stocks is positively related to recent returns, "the effect of past positive returns is much more important on trading activities than that of negative past returns" (Grinblatt and Keloharju, April 2001). Relating to the tax-loss selling, the investors are more likely to realize their losses in December only for tax purposes to eliminate the effect of the loss. Finally, domestic investors tend to be contrarians while foreign investors tend to be momentum investors and the past market-adjusted returns lead investors to sell more.

In another study, Kaniel, Saar and Titman investigated the dynamic relation between net individual investor trading and short-horizon past and future returns for a large cross-section of NYSE stocks. They used daily buy and sell volume of executed individual investor orders from 2,034 stocks listed on the New York Stock Exchange (NYSE) from January 1, 2000 until December 31, 2003. They measured the daily net individual investor trading then conduct a cross-sectional sorting every week before running a multivariate regressions of weekly returns on past returns, volume, and net individual trading. They showed that "individual investors tend to buy after a decrease in prices and sell after an increase in prices," (Kaniel, Saar and Titman, 2008) which means that they are liquidity providers to institutions, and this strategy is consistent with contrarian trading behavior.

The above-mentioned view is also supported in emerging markets where a study to examine whether domestic investors outperform foreign investors in Thailand was conducted. Having intraday transactions data from Stock Exchange of Thailand from January 1999 until December 2004 covering 530 stocks, they calculated the volume-weighted average price to investigate the trade performance of domestic and foreign investors. They also calculated the trade imbalance between buy and sell trades through intense Net Investor Trading (NIT) to test whether differences in trading behavior of each type of investors in the market impact stock returns. Finally, they analyzed patterns associated with the intense selling and buying portfolios in each investor group to explore the relation between realized stock returns and investor trading. Given that their results showed that, “domestic institutions are better informed than the domestic individuals, domestic institutions buy at a higher price and sell at lower price than that of individual investors”, (Taechapiroontong and Suecharoenkit, 2008), who are believed to adopt a contrarian strategy, which leads them to act as liquidity providers to institutions, who required immediacy. The latter is consistent with evidence that institutional investors adopt a more momentum trading strategy than individual investors.

Another example is a study by Chiao, Hung and Lee (2011) who were addressing the issue of the cross sectional relation between stock prices and institutional trading in the Taiwanese stock market to address the trading behavior of institutions and whether such behavior can be attributed to information cascades. They used 229,353 firm-day observations from daily and intraday data on original trades covering the entire stock trading in the period from September 2002 until May 2006. They applied the trade imbalance for each stock in accordance with the method used by Griffin, Harris and

Topaloglu (2003). Then they used returns measured over the opening session as a proxy for extreme intraday price changes and to investigate institutional trading behavior following. Their results showed that, “the institutions adopt the positive feedback trading behavior that is based on returns over the lagged trading day as well as over the opening session during the same day” (Chiao, Hung and Lee 2011).

Bae et al. (2008) looked at the investor behavior from a different perspective. They studied the demand and supply of liquidity among different investor types when they studied the impact of trade interactions between momentum and contrarian traders on market volatility. They used the value-weighted Tokyo Stock Price returns to calculate the market volatility using the weekly trading volume data from first week of January 1991 until the last week of April 1999. Following the momentum trading patterns with respect to market returns “in the buy trades are nonfinancial corporations and foreign investors who are likely to demand liquidity and the contrarian trading patterns in the sell trades are followed by all domestic investors where they tend to sell significantly as market returns increase”(Bae et al., 2008). The net buy trades of foreigners indicate momentum patterns because their buy trades are positively correlated with returns.

Referring to how information asymmetry affects the trading behavior of different investor types, Konukoglu (2010) provided evidence that momentum trading occurs because of a lack of information in the Turkish stock market. He used monthly foreign portfolio transactions for individual stocks listed on Istanbul Stock Exchange that totaled to 38,168 stock-month observations during the period between January 1997 and June 2008. Konukoglu first calculated the volume of foreign trades and the number of stocks bought and sold by foreign investors, he then measured the momentum trading through

the summation of the products of stock level foreign inflow and the last month's returns across all stocks and months in the sample. Finally, Konukoglu used a bi-variate VAR system between foreign flows and returns. The study concluded that foreign investors are momentum traders in stocks with implied low future returns. There's evidence that, "maybe foreigners become momentum traders following momentum spread as a reason for past profitability of the momentum in the local market." (Konukoglu, 2010).

Another study from Thailand examined the trading behavior and trading performance of foreign, individual, institutional and proprietary investors. Having data from the Stock Exchange of Thailand, they used the intraday of all orders from January 1999 until December 2004 to weekly aggregate buying and selling flows to calculate the net investment flow for each investor type to examine the trading patterns of investor groups. They found that, "foreign investors follow positive feedback; momentum-trading strategies where their trades take positions that are against the positions of institutions and individuals", (Phansatan et al., 2012). Individual investors tend to be contrarian investors where they "go against the trend". However, they argued that institutional investors are contrarian and this argument brings up the opinion that institutional investors are between the foreign investors; adopting more of a momentum strategy, and individual domestic individual; adopting a contrarian strategy.

Finally, Chiang et al. (2012) examined the trading behavior of foreign, domestic institutional and domestic individual investors in Taiwan where they used data from the Taiwan Economic Journal and from the Taiwan Stock Exchange of stock transactions from January 1999 until October 2006. To test the threshold effects and non-linear dynamic behavior in the Taiwan stock market, they used the threshold cointegration

model developed by Hansen and Seo (2002), and then they examined the causal relationships between the stock price index and the trading behavior for different types of investors. Results showed that, “institutional investors, both foreign and domestic, go for short-term momentum trading behavior by trading in value stocks while the individual investors act as contrarian traders” (Chiang et al., 2012).

Looking at how investor behavior might be different for foreign investors who are residents in Korea before and during the currency crisis, Kim and Wei (2002) used the monthly positions of every foreign investor in every stock listed on the Korea Stock Exchange during the period from December 1996 until June 1998. They measured the momentum trading, whether it is positive or negative, computed the risk-adjusted returns averaged over all traders in the same group and finally, calculated herding index for each investor group of each stock, in each month to construct an ex post profitability measure of trading as a final step. The two categories of investors were those that are resident in Korea and those that are non-resident in Korea. For the foreign investors, whether institutional or individual, who are resident of Korea, they were found to be, “less likely to adopt either a positive or a negative feedback trading strategy and they were also found to not engage in herding. On the other hand, non-resident foreign investors, both individual and institutional engage in positive feedback trading.” (Kim and Wei, 2002). However, non-resident individual foreign investors were more likely to engage in negative feedback trading once the currency crisis broke out.

Measuring the investor behavior with equity flows, Samarkoon’s (2008) study supports the literature. He investigated whether past returns affect equity flows and whether past equity flows affect future returns using the daily equity flow data categorized by investor

classes of 115 firms listed on the Colombo Stock Exchange in Sri Lanka, resulting in having 264,544 daily observations during the period between January 1992 and December 2004. Applying a bivariate VAR which relate equity flows to past returns, and returns to past equity flows he found that in the matter of the relation between flows and past returns, “all investor types exhibit positive feedback trading behavior in buy trades and contrarian behavior in sell trades which is a pattern that reverses during the time of crisis” (Samarkoon, 2008).

Past returns seemed to have the greatest effect in purchases and sales of domestic investors who are thus believed to engage more in feedback and contrarian behavior than foreign investors. In the opposite spectrum of the literature, studied that argue that domestic investors engage more in momentum trading than foreign investors can be summarized as follows.

In a study by Chan, Menkveld and Yang (2007) of the informational advantage of domestic investors in China’s stock market, they used a sample that is composed of the intraday returns and order flows; basically all transaction data for A- and B- shares of 76 listed companies from January 2000 until November 2001 and these are divided into two sub-periods where one was for the time before February 19, 2001 and the other period after February 19, 2001. The reason for their division of periods was that before February 19, 2001, A-share market was for domestic investors alone and the B-share market was for foreign investors alone but after that period, the domestic investors were allowed to trade in the B-share market. Their model is an extended vector autoregressive (VAR) for multiple markets to examine the dynamic relationship among traders in the A- and B-share markets as well as a vector error correction model (VECM) to examine the co-

integration relationship between A- and B-share prices and conduct an information shares analysis on the two markets as well as conducting an event analysis based on large order imbalance intervals. Their results showed that before Feb 19, 2001, “domestic investors followed a positive feedback trading while foreigners did not act according to price movements in the B-share market. Although that after Feb 19, 2001 the differences in the trading behavior between domestic and foreign investors are not as pronounced as they used to be,” (Chan, Menkveld and Yang, 2007). The evidence still supports that more positive feedback trading is followed in the A-share market than in the B-share market.

Few studies provide evidence that sophisticated investors do not simply blindly follow an investment strategy, they rather trade in a rational manner which could result in them trading in a way that is contrary to common belief or even having different strategies depending on the market conditions and their fundamental analysis.

For example, Ulku and Ikizlerli (2012) analyzed the interaction between foreigners’ trading and emerging stock returns. They applied a structural VAR model augmented with world returns that are set to be exogenous to local variables as well as extended the VAR approach to individual stocks by using returns and net flows defined in relative terms. The data used is the monthly foreign flows on the Istanbul Stock Exchange and the ISE-100 for the local market returns. They obtained this data for the period from January 1997 until January 2011. Their results showed that foreign investors engage in negative feedback trading following only positive returns and not negative returns, and, “foreigners’ contrarian trading with respect to local returns did counteract excessive bullish sentiment among domestic investors in a fragile and unstable economic environment in the first half.” (Ulku and Ikizlerli, 2012). This can be interpreted to



indicate that foreigners are sophisticated investors who can rationally adjust their trading style in line with the prevailing pattern of the fundamentals and the behavior of other participants, rather than naively pursuing a specific feedback trading or rebalancing strategy.

Prevalent evidence in the literature show that herding is a strategy followed more by individual and foreign investors than any other type of investors. In Korea, evidence shows that, “non-resident foreign investors are more likely to herd than their resident counterparts, with individual traders herding more than institutional traders.” (Kim and Wei, 2002).

In another study by Feng and Seasholes (2004) they analyzed the trading behavior of stock market investors where they used account-level trades placed from individual brokerage accounts in the People’s Republic of China from May 1999 until December 2000 to examine them. Their results showed that individual investors tend to herd and that, “investors in one region tend to trade in the same way and those in another region trade in a similar way to each other” (Feng and Seasholes, 2004), where buys from investors in one region would be purchases by investors in the other region of the country.

However, discussing herding in more details, an examination of the herding behavior of domestic and foreign investors in the Indonesian stock market within a brokerage firm and across brokerage firms shows that all investors herd, but consistent with literature, foreign investors herd more. Agarwal et al. (2010) adopted the herding measure of Lakonishok, Shleifer, and Vishny (LSV) (1992) in daily, weekly, and monthly horizons

for all orders and trades of 378 stocks in the Jakarta Stock Exchange handled by 226 individual brokerage firms from May 1995 until May 2003. Their results showed that all investor types herd, but foreigners are stronger herders. They also found that, “both domestic and foreign investors within a certain brokerage firm tend to buy and sell stocks together while there is no evidence that foreigners herd across brokerage firms and domestic investors are reported to show weak evidence of herding across brokerage firms” (Agarwal et al., 2010).

Chiao, et al. (2011), on the other hand, provided another result contrary to the literature. The study proved that institutions herd, but following their own trades and not that of other investors in the market. Their herding “exists among stocks with positively correlated signals but not among stocks with negatively correlated signals” (Chiao, et al., 2011) where the investigative herding hypothesis is proven as the institutions herd as a result of their positive feedback trading and that they determinedly follow their own initiative to trade and don’t gather information from trades made by other institutions.

Trading behavior of investors is not only affected by past returns and the movement of prices of stocks. An opposite view to the above-mentioned discussion- that different investor types adopt different trading strategies following a trend and/or certain movements in the market- provide evidence that the more sophisticated investors tend to rely more on their fundamental analysis than on co-movements of prices and returns in the market. These studies are summarized as follows.

In the emerging Chinese market, Lee, Li and Wang (2010) studied the daily dynamic relation between returns and institutional and individual trades. They used the daily

transaction records on all the component stocks of the SSE 180 Stock Index for 610 trading days from July 1, 2002 until December 31, 2004 in order to measure the average magnitude of the individual or institutional trading activities at the overall market level and the portfolio level through calculating total trading for individuals and institutions in order to examine the relationship between returns and institutional (individual) trading. Then, they conducted the Granger-causality test based on bivariate vector auto regression to examine the daily dynamic behavior of total trading volume and market index returns and finally, they carried out event study to examine the abnormal institutional and individual trading activities around earnings announcements. “In general, institutional investors tend to be better-informed, have a long-term investment perspective and make investment decisions based on the fundamental value of stocks. By contrast, individual investors tend to be less informed, have a more short-term and speculative investment perspective, and are more susceptible to the influence of psychological biases and attention-grabbing events. Uncertainty about the quality of other investors' information can cause investors to place too much weight on market prices and too little on their own information.” (Lee, Li and Wang, 2010) and accordingly, individual investors tend to have a stronger reaction towards shocks than do institutional investors who depend more on their fundamentals and information.

And in another study, Kang et al. (2010) hypothesized that domestic and foreign investors evaluate domestic stocks via different models and arrive at different valuations for them and so are attracted to different sets of domestic stocks. They used 2798 firm-year observations of foreign ownership, accounting information and daily stock return data were available from the Korean Stock Exchange of all non-financial companies

listed during the period between 2000 and 2004. Using cross-sectional orthogonalization of the foreign valuation to the domestic valuation, and vice versa resulted in the valuation difference that is unrelated to the cross-sectional pattern common to both valuation levels to find that foreigners hold stocks for which their valuation is higher than that of domestic investors where “foreigners in a domestic market are international investors who invest in multiple countries and thus their performances are likely to be assessed in a global context... foreigners evaluate domestic stocks via a global benchmark... [and] are attracted to domestic stocks when those stocks outperform stocks outside the domestic market” (Kang et al., 2010) which shows the foreign investors as rational, sophisticated investors who trade according to the fundamentals of the stock rather than follow trends in the market.

There are other elements that affect the investor behavior in the market that are not much discussed in the literature like the disposition effect and tax-loss selling. Grinblatt and Keloharju (April 2001) provided evidence that disposition effect and tax-loss selling are two major determinants of the tendency to sell a stock that an investor owns. Stocks with large positive returns in the recent past and with prices at their monthly highs are more likely to be sold and since they found that the disposition effect interacts with past returns, this modifies the propensity to sell. The disposition effect can be regarded as the opposite of tax-loss selling in that investors are holding onto losing stocks more than they are holding onto winning stocks. The tendency to sell is positively related to whether a stock has hit its high price within the past month, so “for households, nonfinancial corporations, and finance and insurance institutions, this relation is highly significant. For households, being at a monthly low is significantly positively related to

the propensity to sell. These reference price variables have been shown to influence investment behavior.”(Grinblatt and Keloharju, April 2001).

In the light of different factors that might affect the trading behavior of investors, Grinblatt and Keloharju (June 2001) researched the impact of location, language of communication and cultural background on the institutional and household decisions to hold, buy, and sell stocks of the Finnish firms. The data used to conduct such a study include the daily share ownership records and trades between December 1994 and January 1997 for 97 publicly traded companies from the Finnish Central Securities Depository along with other data that, “defines the cultural background, language used and distance between the investors and the headquarters of the firms they trade in.” (Grinblatt and Keloharju, June 2001). They analyzed open market buys and sells as well as share ownership where the buys excluded IPOs and gifts as means of acquisition. Their study showed that investors tend to hold and trade stocks of firms that have headquarters are closer to them, publish their annual reports in the investors’ native tongue, and have CEO of familiar cultural origin.

## *2.2. Section II: Trading Performance*

It is important to understand how the different trading behaviors affect the profitability and performance of the different investor types. What is common in the literature is that momentum traders lose and contrarian traders win.

For example, Konukoglu (2010) provided evidence in the Turkish market that on average, momentum has negative profitability making foreign investors in this case adopting a suboptimal trading strategy.

In another study, Kim and Wei (2002) found that investors engaging in positive feedback trading generate negative risk-adjusted returns whereas contrarian trading generates positive risk-adjusted returns. Ex post risk-adjusted profitability seemed to be controlled by the negative feedback trading investors over the positive feedback trading investors.

However, some studies argue that while the performance of different investor types is related to the investor behavior of each investor type, other factors that might either cancel out their profits or make them profitable even if their stock selection is poor are, the market timing and market conditions of whether it is bullish or bearish.

A summary of these studies includes the study by Phansatan et al. (2012) who concluded that foreign investors' momentum trading strategies lead to superior short-term market timing performance only while their security selection performance is very poor canceling out overall net trading gains. Although the persistent trading strategies of proprietary traders lead to good short-term but poor long-term market timing performance, "they profit from their liquidity provision role to the markets via short-term market trading gains that are at the expense of individual investors" (Phansatan et al., 2012). However, trading of proprietary and institutional investors lead to very inferior security selection and so very weak overall trading performance while individual investors' herding behavior leads to gains from security selection at the expense of all the other investor types but their weak poor market timing cancels out these gains.

Another example was while investigating the gains and losses from equity trades of individual investors, various institutional investors, and foreign investors in the Tokyo Stock Exchange where Bae, Yamada and Ito (2006) used weekly trade data of all investor

types on the Tokyo Stock Exchange from the first week of January 1991 until the last week of April 1999. In order to study the effect of trading intervals, price spreads, and market timing on performance, they used the trade-weighted performance measure as well as standardizing measure that compare trading performances between different investor types. According to their results, “foreign investors profit from good market timing but they tend to have minor losses due to negative spreads between the buy and sell prices that they trade at. On the other hand, unsophisticated investor, such as individual investors make gains due to the positive spreads between sell and buy prices, specifically in the short-term but their losses are due to the bad market timing.” (Bae, Yamada and Ito, 2006). This could be the result of their contrarian investment style where individual tend to sell winning investments and keep the losing investments in the hope that they might turn into winning investments by time. Adopting a momentum strategy due to information asymmetry, foreign investors tend to “seek more trading gains from macro management (e.g., market prediction and/or asset allocation) than from micromanaging (e.g., stock picking) of their portfolios” (Bae, Yamada and Ito, 2006).

The study by Taechapiroontong and Suecharoenkit (2008) found that “stock prices decrease after net intense selling of individual traders while stock prices are positive around foreign investor’s net intense buying”. This means that individual investors sell stocks post price increase and the price reverses while stock prices increase after institutions and foreign investors buy stocks, which implies the possibility of predicting future returns. They also found that although the performance of the foreign investors is worse than that of domestic investors during bear market and during bull market through the sells, they turn to more liquidity stocks at better price than individual and institutional

domestic investors during bull market.

Looking at performance from a different perspective, Dvorak (2006) studied the effect of trading with a global brokerage firm on making profits. Using every transaction data of the 30 most liquid stocks and information from 200 brokerage firms from Jakarta Stock Exchange in Indonesia from January 1998 until the end of 2001, he calculated pre-transaction profits of a group of investors where profits are calculated as the product of stock holdings and the price increase. The conclusion was that clients of a global brokerage firm made more profits on the long run than clients of a domestic brokerage firm. However, the medium and short-run profits were higher for clients of domestic (but not other, non-global Asian brokerage firms) brokerage firms than for clients of global firms; this result was attributed to inside information. When analyzing the clients of global brokerage firms, Dvorak found that domestic clients of global brokerage firms made more profits than the foreign clients.

Dissimilar results, however, are shown in a few studies that have found that foreign investors, who are most commonly known as momentum traders, perform better in the market than individual domestic investors, who are believed to adopt a contrarian investment strategy.

Barber, Lee, Liu and Odean (2009) were documenting that trading in financial markets leads to economically large losses for individual investors. They used the entire transaction data in the Taiwan stock market from 1 January 1995 until 31 December 1999 to construct portfolios that mimic the purchases and sales of each investor group. What they found was that individual investors lose a lot through their bad market timing as well



as through their trading and the institutions become on the gaining end of these tradings. They also document that “when profits are tracked over six months, foreigners earn nearly half of all institutional profits; at shorter horizons, foreigners earn one-fourth of all institutional profits. The profits of foreigners represent an unambiguous wealth transfer from Taiwanese individual investors to foreigners. Whether the remaining institutional profits represent a wealth transfer depends on who benefits when domestic institutions profit” (Barber, Lee, Liu and Odean, 2009).

Another study claims that information advantage of local institutional investors should help them outperform the foreign investors in the local market. However, “with the institutional foreign investors propensity of trend chasing, they manage to gain profits through more conservative trading using small orders and less aggressive prices” (Tsai, 2013).

Informed institutional domestic investors increase performance with having private information, however, foreign institutions and individual investors perform better when domestic institutions partially replace large-sized orders with medium sized ones in a longer pre-event period.

Some studies took a different approach than generally taken in the literature by examining some factors that affect profitability that is not related to investor trading strategy, market timing or skills of stock picking.

An example of such study is one that is done by looking at how proximity of traders to the headquarters of corporations in which they trade might affect their profitability, Hau (2001) used the transactions of German Security Exchange’s electronic trading platform

which traded for 11 German blue-chip stocks represented in the Stoxx 50 index as well as obtaining data for 756 traders located in eight European countries from 31 August, 1998 until 31 December 1998. He calculated trading profits based on actual transaction data over the four-month period and found that traders located in the financial center did not outperform traders in other German locations, however, “traders in locations that don’t speak German underperform with respect to intraday, intraweek, and intraquarter trading profits” (Hau, 2001). The traders who were located closer to the headquarters of corporations they traded in outperformed other traders in high frequency trading while there is no effect of proximity on medium and low frequency trading.

### *2.3 Section III: Effect on Stock Market*

The effect of the trading behavior of the different types of investors in the market do not only affect them in the form of performance and profitability, it affects the overall market. Various trades by foreign, individual and institutional investors-which follow a specific investment style- have effects on liquidity of the market as well as the volatility of prices in the market. Several studies are summarized, to examine the different effects on the market, as follows.

Rhee and Wang (2009) studied the relationship between foreign institutional ownership and liquidity. They used the JSX and KSEI data that provide the daily holdings of scrippless shares by different types of investors from 1 January 2002 until 31 August 2007. They examined the Granger causality between foreign ownership and liquidity to test whether foreign participation enhances local market liquidity. Higher foreign ownership leads to higher information asymmetry, as foreign investors become corporate insiders,

which also contributes to them not trading frequently for price discovery. These aspects reduce the market liquidity. So the higher the contribution of foreign investors in the market, the more they gain insights about the company and the less they need to trade harming the overall liquidity of the market.

Another example provided evidence from six Asian markets as well as the Johannesburg Stock Exchange, that foreigners affect the short-term market conditions rather than harm the market at all times. Agudelo (2010) studied the foreign flows and liquidity using daily market data ranging from 1996 until 2006 with different time horizons for each of the following markets: Jakarta Stock Exchange in Indonesia, Bombay Stock Exchange in India, Korean Stock Exchange, Philippines Stock Exchange, Johannesburg Stock Exchange in South Africa, Taiwan Stock Exchange and Stock Exchange of Thailand. He used the proportional quoted bid-ask spread to calculate the liquidity and provide a case study on the differential effects of foreign trading and foreign ownership on liquidity. He provided that the effect of foreign trading on liquidity is a negative one, however, it is a short-term effect at both the firm and the market level. There are two possible reasons for this finding found in the literature are: that foreign investors on average are better informed than locals and the other possible explanation that is more obvious in this study was that “foreigners seem to be per se more aggressive liquidity demanders than locals” (Agudelo, 2010). To sum up, there is evidence that foreign ownership is beneficial for liquidity on the firm level as well as on the market level in a span of days and weeks, but, in the very short term, foreign ownership is harmful for liquidity.

Tackling the effect of trades on volatility as well, Bae et al. argued that momentum investors require liquidity for their buy trades as the prices increase, which may cause

further increase in prices or greater volatility. Foreign investors' trading tends to increase volatility and are less likely to smooth market liquidity, while trades of financial institutions are related to lower volatility relative to the rest of the market traders. The overall volatility of the market depends on both sides of trades, "the higher participation of nonprofessional investors... generally tends to be associated with higher volatility. However, the level of volatility depends on which investor type participated on the other side of the market, and is lower when financial institutions participate on the other side" (Bae et al., 2008). This result confirms the view that foreign investors are at an information disadvantage and so their trades increase the volatility in the market as they are mostly based on trends and not fundamental information.

While the more informed investors, the institutional investors, their trades do not increase the volatility or tighten the liquidity in the market. Despite the large pool of literature that provide evidence that foreign investors' trades are destabilizing, especially in the emerging market, some studies oppose to that providing that foreign investors are not destabilizing the market and that the effect of their trades on volatility, if existent, is minor and cannot just destabilize the market.

In this study, the impact of institutional trades on volatility in international stocks across 43 countries was examined Chiyachantana, Jain, Jiang and Wood (2006). Their sample was composed of data on institutional trading in stocks of 43 countries from the Plexus Group as well as the international stock market indices for the 43 countries. Applying this on the first three quarters of 2001, the temporarily examined the volatility changes in the institutional trading period, by having information about stock prices 15 days before an institutional decision as well as the long lasting volatility effect in the post transaction

period with information on stocks 25 days after an institutional decision in 2001. Their study showed no evidence of increased volatility of prices of stocks after the completed trades of institutions where only brief higher volatility can be noticed that can be a destabilizing effect. There is no evidence of a consistent, long lasting effect on stock price volatility in the institutional pre-decision period of trades, “in sum, all of our sub-samples, the levels of post-transaction volatility are the same or slightly lower than their pre-trade benchmarks. Thus, the characterization of foreign institutions as speculators having a destabilizing effect on markets is unwarranted. Post trade volatility should not be a concern in promoting ever increasing globalization of institutional investment activity” (Chiyachantana, Jain, Jiang and Wood, 2006). The latter also proves that institutional trades do not destabilize the market.

Further evidence is summarized in the following study in more details providing that institutional investor trades can be disruptive for the market in certain conditions. Li and Wang (2010) examined the short-run dynamic relation between daily institutional trading and stock price volatility in a retail investor dominated emerging market. They used the daily transaction records of traders of 226 sample component stocks of the SSE 180 Stock Index of China from July 1, 2002 until December 31, 2004. They calculated the institutional buy-sell imbalance and the high-low price range estimator to measure volatility and then conducted a regression model to examine the contemporaneous relation between daily individual stock price volatility and institutional trading as well as a regression to examine whether the institutional trading variables can explain the asymmetric volatility effect and whether they have independent explanatory power beyond their ability to explain the asymmetric effect. Institutional trading has negative

significant association with volatility of prices. The price volatility is negatively related to the institutional buys but positively related to institutional sells. The expectancy of the institutional investors trading affect the volatility where “unexpected buys help to reduce price volatility more than expected buys, long-run and expected institutional sells help stabilize stock prices, and unexpected sells destabilize stock prices... Institutional net buys stabilize the market during lows but do not destabilize the market during highs except for the largest stock portfolio. Institutional buys help to reduce volatility more on return down days but the sells do not help to stabilize the market on either up or down days” (Li and Wang, 2010).

#### *2.4 Section IV: Contribution*

The aim of this paper is to focus in the investment behavior of various types of investors in the Egyptian market. This study will be the first to the best of my knowledge, in Egypt as well as the whole MENA region. With the unique set of intraday data of all executed transactions of domestic, Arab and foreign investors, both individual and institutional, prices and volumes for the period of six years from 2004-2009 described in section 3, this study aims to show that domestic individual investors are the most contrarian across five different time spans and that foreign institutional investors are the most momentum investor across the five time intervals.

## CHAPTER III

### Data

#### *3.1 Sample Market<sup>1</sup>*

The Egyptian exchange was first established in 1883 in Alexandria. It is considered to be one of the oldest stock exchanges to be established in the Middle East. Twenty years after the establishment of Alexandria Stock Exchange, the Cairo Stock Exchange was established in 1903. Alexandria had one of the oldest futures market in the world in the 1800s and Egypt marked its first local trade in 1885. Since then, the stock exchange has been developing and growing. Dates that mark important events in the stock exchange are:

1909 -> The issuance of the first general regulations for the stock exchanges

1947 -> Commencement of the Over the Counter (OTC) market in Egypt

1980 -> The establishment of the Capital Market Authority (CMA)

1994 -> Shift from an outcry system to an automated order-driven system

Issuing a law to establish Misr for Clearing, Settlement and Depository company

1996 -> Unifying the trading between Alexandria Stock Exchange and Cairo Stock Exchange

1997 -> Egypt was added to the International Finance Corporation (IFC) Global and Investable indices

1998 -> Launching case 30 which became known later as EGX30 with a base value of 1000 Egyptian pounds

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<sup>1</sup> Data about the sample market were obtained from the Egyptian Exchange website

2000 -> The establishment of Settlement Guarantee Fund to ensure timely settlement of transactions

2001 -> Egypt was added on the Morgan Stanley Capital International (MSCI) Emerging Markets Free Index (EMF), EMEA and All Country World Index

2002 -> EGX started its new price ceiling system that removed 5% ceiling in daily prices with regard to the most active stocks based on fulfilling specific criteria

2005 -> Same day trading started

2007 -> EGX launched NILEX, the first Mid and Small Cap market in the MENA region

2009 -> EGX launched EGX100 Price Index and EGX70 Price Index

2011 -> EGX launched EGX 20 Index

2014 -> EGX launched NILEX First Index

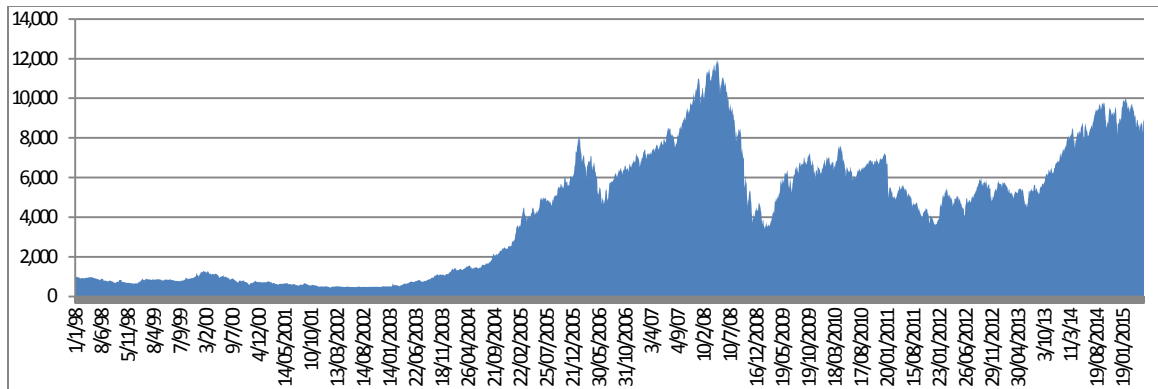
There are six different types of indices in the EGX. The oldest of them all is the EGX 30, which is the index that includes the listed companies with the highest liquidity and activity. EGX 30 index uses the market capitalization for weighting and it is adjusted by free float.<sup>2</sup> The criteria for inclusion of a company in the EGX30 is having at least 15% free float to ensure that the company is actively trading in the market and thus EGX 30 would be a true representative of the Egyptian market making it an important indicator of the market condition. The following graph shows the price movements of the EGX30 since inception in 1998 until February 2015

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<sup>2</sup> Free float adjustment to market capitalization is done through multiplying the closing price of a stock by the number of shares outstanding and multiply this by the percentage of free floated shares of this stock



Figure 1 Price movements of the EGX30 from January 1998 until February 2015



There is the EGX 70 Price Index that unlike the EGX 30 is not weighted by market capitalization. It rather captures the change in the closing prices of the most active companies excluding the top 30 companies that constitute the EGX 30.

Third is the EGX 100 Price Index, which combines the EGX30 and the EGX 70 constituents. Like the EGX 70, it measures the change in the closing prices without being weighted by the market capitalization. A new addition is the EGX 20 capped, “designed to capture the performance of the most active 20 companies in terms of market capitalization and liquidity, capping the weight of any constituent to a maximum of 10%” (The Egyptian Exchange, 2015). In September 2007, the EGX launched 12 sector indices that include Banks, Basic Resources, Chemicals, Construction and Materials, Food and Beverage, Financial Services excluding Banks, Healthcare and Pharmaceuticals, Industrial Goods, Services and Automobiles, Personal and Household Products, Real Estate, Telecommunications, Travel and Leisure. Finally, the S&P EGX ESG index was introduced in March 2010 to be “the first & only ESG index in the Middle East and North Africa Region designed to track the performance of companies listed on EGX that demonstrate leadership in environmental, social and corporate governance (ESG) issues”

(The Egyptian Exchange, 2015).

As of May 21, 2015, there are 171 listed companies with trading volume of 257,336,876 and a value of EGP 752,431,633 and a total market capitalization of 504,532,827,947.

On the EGX, the fixed trading hours are from 10:30 a.m. until 2:30 p.m. according to the local Egyptian time from Sunday to Thursday. Licensed brokers enter orders through terminals on the main trading floor. Misr for Central Clearing, Depository and Registry (MCDR) has the Clearing House role whereby it handles clearing and settlement on trade securities between the buying and selling member firms through applying the Delivery versus Payment system according to the following:

- T+0 for securities traded by the Intra-day Trading System
- T+1 for government bonds that are traded through Primary Dealers System
- T+2 for all other securities

### *3.2 Data Sources*

There are two main sources of data that I use in order to investigate the investment style of the different investor groups in the Egyptian market. The main dataset involves transaction data from the Egyptian clearing house, Misr for Central Clearing, Depository and Registry (MCDR). The transaction data employed in this study is the property of Dr. Aliaa Bassiouny and was provided for this specific analysis. The data was proprietarily obtained from the Misr Clearing and Central Registry for academic purposes. It contains information on all trades for securities trading on the Egyptian stock exchange. The time span of the data is six years from 2004 until 2009 and has complete transaction records on 70 firms. Those 70 firms represent the most active stocks with the highest number of

days trading in those six. A transaction record for each of the 70 stocks includes the following: date of trade, sequence of trade, price, quantity, seller's type and buyer's type. I also obtained the prices of the EGX30 during the sample period in order to calculate the return on the market.

An overview of the statistics and indicators of the market over the six years of the sample period is presented in table 1. The Egyptian market has shown to be one of the top performing markets among the emerging markets in the period from 2004-2007, which is proven through the extraordinary returns achieved. It was a period of market growth. The average annual USD adjusted market returns on the MSCI index, the emerging market index, was 33% during this period, while it was 43% on the EGX during these first four years of the sample. The great losses observed in 2008-2009 were due to the financial crisis where the Egyptian market did not have restrictions on the trading of foreign investors unlike other emerging markets.

Those 70 firms are the most actively traded firms on the EGX comprising an average of 46% of the total market capitalization of the EGX making up approximately 84% of the value traded between 2004 and 2009.

Table 1 Main Statistics of the EGX and Sample Indicators

<b>Market and Sample Indicators</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
<i>USD Return (%)</i>	46.3	69.3	16	40.36	-51.1	-9.6
<i>Turnover (%)</i>	17.9	42.3	41.8	39.4	63.1	77.9
<i>Total Number of Trades</i>	1,151,958	3,255,018	6,418,255	7,529,345	5,658,232	8,962,357
<i>Proportion of Value Traded (%)</i>	65.2	70.2	70.6	84	52	36.5
<i>Proportion of Market Cap</i>	33.9	48.5	46.4	43.6	34.6	45.5

Table 2 contains the filtered 70 companies to reach the final sample of 46 firms chosen according to the number of years they have been listed as no company was picked if it

traded for less than 3 years on the EGX. Moreover, these firms needed to be traded by the three major investor groups in Egypt, that being the domestic investors, Arab investors and the foreign investors. This final sample constitutes more than 31 million trades during the sample period averaging to 44% of the total market capitalization and 65% of total annual value traded on EGX which makes drawing conclusion from it dependable.

Table 2 Sample firms and descriptive statistics of returns

Firm Name	Ticker	Industry	Market Value (EGP)	Number Trading Days	Average Proportion of Market Cap (%)	Mean Monthly raw return 2004-2009	Mean Monthly return over riskless rate 2004-2009	Std. dev. of monthly raw return 2004-2009	Std. dev. of monthly return over riskless rate 2004-2009
<i>Egyptians Abroad</i>	ABRD	Financial services	13,386,148	1,198	0.01	0.006	-0.768	0.38	0.45
<i>Arab Cotton Ginning</i>	ACGC	Household products	233,090,129	1,433	0.12	0.013	-0.761	0.223	0.273
<i>Al Ahly for Development and Investment</i>	AFDI	Financial services	65,747,994	1,386	0.07	0.03	-0.745	0.251	0.311
<i>Alexandria Mineral Oils co</i>	AMOC	Oil and Gas	6,735,603,000	1,002	1.03	-0.014	-0.766	0.101	0.199
<i>Arab Polvara Spin. &amp; Weave. Company</i>	APSW	Household products	248,165,376	1,435	0.08	0.007	-0.768	0.21	0.276
<i>Credit Agricole Egypt</i>	CIEB	Banks	195,320,282	954	0.07	-0.015	-0.794	0.265	0.308
<i>Commercial International Bank (Egypt)</i>	COMI	Banks	4,990,910,743	1,435	2.31	0.014	-0.761	0.118	0.199
<i>Canal Shipping Agencies Co</i>	CSAG	Industrial Goods	880,877,863	1,418	0.51	0.03	-0.745	0.205	0.271
<i>National Bank for Development (Egypt)</i>	DEVE	Banks	198,433,728	1,374	0.09	-0.001	-0.776	0.223	0.269

<i>El Ezz Ceramics and Porcelain Co (Gemma)</i>	<i>ECAP</i>	<i>Construction</i>	177,391,270	1,436	0.08	0.02	-0.755	0.204	0.264
<i>Egyptian Financial and Industrial</i>	<i>EFCO</i>	<i>Chemicals</i>	269,054,676	1,419	0.1	-0.011	-0.785	0.256	0.339
<i>Egyptian Resorts Company</i>	<i>EGTS</i>	<i>Travel</i>	103,647,002	1,085	0.05	-0.035	-0.81	0.418	0.441
<i>Egyptians Company for Hous, Deve &amp; Recon.</i>	<i>EHDR</i>	<i>Real estate</i>	888,299	730	0.03	-0.003	-0.781	0.302	0.349
<i>Egypt Kuwait Holding Co (SAE)</i>	<i>EKHO</i>	<i>Financial services</i>	1,534,123,135	1,434	0.21	-0.007	-0.782	0.224	0.291
<i>Electro Cable Egypt Co</i>	<i>ELEC</i>	<i>Industrial Goods</i>	61,160,319	1,419	0.02	-0.013	-0.788	0.413	0.432
<i>El Kahera for housing and Development</i>	<i>ELKA</i>	<i>Real estate</i>	57,044,859	1,434	0.03	0.017	-0.758	0.234	0.304
<i>El Shams Housing and Urbanization SAE</i>	<i>ELSH</i>	<i>Real estate</i>	77,551,314	1,428	0.04	0.016	-0.759	0.257	0.319
<i>Egyptian Company for Mobile Services</i>	<i>EMOB</i>	<i>Telecommunications</i>	12,975,334,680	1,429	3.87	0.015	-0.76	0.095	0.17
<i>Egypt for Poultry</i>	<i>EPCO</i>	<i>Food and beverages</i>	2,612,202	1,363	0	0.019	-0.756	0.272	0.34
<i>Al Ezz Steel Rebars Company SAE</i>	<i>ESRS</i>	<i>Basic resources</i>	2,009,018,400	1,436	0.83	0.019	-0.756	0.242	0.312
<i>Telecom Egypt SAE</i>	<i>ETEL</i>	<i>Telecommunications</i>	32,792,845,436	951	4.85	-0.001	-0.753	0.094	0.188
<i>Housing and Development Bank</i>	<i>HDBK</i>	<i>Financial services</i>	97,117,200	1,352	0.09	0.01	-0.765	0.179	0.222
<i>Heliopolis Co for Housing &amp; Development</i>	<i>HELI</i>	<i>Real estate</i>	362,084,904	1,238	0.46	0.01	-0.765	0.308	0.372
<i>EFG Hermes Holding SAE</i>	<i>HRHO</i>	<i>Financial services</i>	559,973,449	1,356	0.98	0.023	-0.752	0.208	0.267
<i>Egyptian Iron and Steel Company</i>	<i>IRON</i>	<i>Basic resources</i>	55,465,437	1,376	0.02	0.025	-0.75	0.216	0.274

<i>El Nasr Clothes and textiles Co Kabo</i>	<i>KABO</i>	<i>Household products</i>	69,279,237	1,383	0.02	-0.016	-0.791	0.388	0.415
<i>Misr Chemical Industries Co.</i>	<i>MICH</i>	<i>Chemicals</i>	240,467,804	1,434	0.09	0.014	-0.761	0.165	0.238
<i>Nasr City Company for Housing &amp; Development</i>	<i>MNHD</i>	<i>Real estate</i>	798,791,000	1,400	0.5	0.004	-0.771	0.28	0.314
<i>Egyptian Media Production City co</i>	<i>MPRC</i>	<i>Media</i>	2,283,870,999	1,435	0.42	-0.01	-0.785	0.146	0.225
<i>Nile Cotton Ginning</i>	<i>NCGC</i>	<i>Household products</i>	25,021,393	1,182	0.06	0.023	-0.754	0.236	0.313
<i>Sixth of October Dev and Inv</i>	<i>OCDI</i>	<i>Real estate</i>	57,076,512	1,406	0.3	0.047	-0.728	0.301	0.348
<i>Orascom Construction Industries</i>	<i>OCIC</i>	<i>Construction</i>	10,456,154,263	1,436	6.94	0.017	-0.758	0.177	0.248
<i>Orascom Hotels and Development</i>	<i>ORHD</i>	<i>Travel</i>	480,000,000	1,411	0.56	0.024	-0.751	0.221	0.278
<i>Orascom Telecom</i>	<i>ORTE</i>	<i>Telecommunications</i>	28,067,239,530	1,431	11.87	-0.013	-0.788	0.252	0.276
<i>Egyptian Saudi Finance Bank</i>	<i>SAUD</i>	<i>Banks</i>	122,213,194	1,365	0.04	0.009	-0.766	0.186	0.253
<i>Sidi Kerir Petrochemicals Co</i>	<i>SKPC</i>	<i>Chemicals</i>	2,236,290,000	1,073	0.92	-0.041	-0.793	0.249	0.293
<i>Samad Misr EGYFERT</i>	<i>SMFR</i>	<i>Chemicals</i>	13,559,660	1,112	0.01	0.019	-0.755	0.213	0.276
<i>Alexandria Spinning and Weaving</i>	<i>SPIN</i>	<i>Household products</i>	233,977,020	1,208	0.09	-0.027	-0.802	0.401	0.425
<i>South Valley Cement</i>	<i>SVCE</i>	<i>Construction</i>	132,693,741	1,399	0.16	0.005	-0.77	0.332	0.38
<i>El Sewedy Cables Co</i>	<i>SWDY</i>	<i>Industrial Goods</i>	2,796,989,586	837	0.98	0.015	-0.742	0.163	0.278
<i>United Arab Shipping</i>	<i>UASG</i>	<i>Industrial Goods</i>	9,654,565	1,026	0.04	0.013	-0.763	0.275	0.318
<i>Upper Egypt Contracting Co</i>	<i>UEGC</i>	<i>Construction</i>	3,524,481	997	0.01	-0.012	-0.787	0.373	0.394
<i>United Housing &amp; Development</i>	<i>UNIT</i>	<i>Real estate</i>	61,906,679	1,175	0.05	0.02	-0.755	0.209	0.276

<i>Vodafone Egypt</i>	<i>VODE</i>	<i>Telecommunications</i>	12,722,563,133	1,004	4.63	0.013	-0.762	0.131	0.194
<i>Al Watany bank of egypt</i>	<i>WATA</i>	<i>Banks</i>	320,367,170	1,204	0.45	0.022	-0.753	0.148	0.225
<i>Extracted Oils and Derivatives Co</i>	<i>ZEOT</i>	<i>Oil and Gas</i>	31,495,192	1,430	0.02	-0.017	-0.791	0.304	0.344
<i>Total</i>			93,067,137,566						

Table 2 also contains key statistics about the sample including the average monthly returns and the standard deviation of the average monthly returns in order to get a more detailed overview of the sample. Table 2 also reports the average monthly risk premiums relative to the annualized 3-months T-bill rate as the risk-free return and the standard deviation of the average monthly risk premiums for each of the stocks. Table 3 summarizes the descriptive statistics of the equally weighted portfolio of the 46 stocks and the value-weighted portfolio of the 46 stocks.

Table 3 Descriptive statistics of returns of equal- and market cap-weighted portfolios of the 46 stocks

<b>Equally Weighted portfolio</b>			
<i>Raw mean</i>	<i>Raw mean minus risk free rate</i>	<i>Std. dev. of raw mean</i>	<i>Std. dev. of raw mean minus risk free rate</i>
0.020	-0.740	0.120	0.211
<b>Value Weighted portfolio</b>			
<i>Raw mean</i>	<i>Raw mean minus risk free rate</i>	<i>Std. dev. of raw mean</i>	<i>Std. dev. of raw mean minus risk free rate</i>
0.129	-0.674	0.129	-0.674

### 3.3 Investor Groups Description

The variety of the different types of investors in the EGX makes Egypt the perfect market to analyze the investment behavior, especially since there are no restrictions on foreign trading and ownership. One distinctive quality of this analysis is having six classifications of investors in the Egyptian market. They are grouped according to origin; domestic, Arab and foreign investors as well as by type; individual and institutions. Tables 4 and 5 summarize the daily fraction of buy volume for each investor group and the trading statistics over the sample period. As table 4 shows, the fraction of the daily buy volume show that domestic investors contribute with the largest share of buy volume, especially the individual domestic investors followed by the foreign institutional investors.

Table 4 Daily fraction of buy volume attributable to each share and investor class

<b>Stock</b>	<b>Individual Arab</b>	<b>Institutional Arab</b>	<b>Individual Domestic</b>	<b>Institutional Domestic</b>	<b>Individual Non-Arab</b>	<b>Institutional Non-Arab</b>
<i>ABRD</i>	0.016	0	0.955	0.022	0.003	0.003
<i>ACGC</i>	0.05	0.013	0.86	0.049	0.004	0.024
<i>AFDI</i>	0.027	0.008	0.918	0.037	0.005	0.006
<i>AMOC</i>	0.075	0.047	0.631	0.166	0.003	0.077
<i>APSW</i>	0.028	0.007	0.946	0.012	0.003	0.004
<i>CIEB</i>	0.062	0.024	0.677	0.144	0.005	0.089
<i>COMI</i>	0.256	0.082	0.21	0.119	0.005	0.328
<i>CSAG</i>	0.036	0.012	0.931	0.013	0.002	0.006
<i>DEVE</i>	0.035	0.017	0.897	0.043	0.002	0.006
<i>ECAP</i>	0.033	0.007	0.929	0.021	0.004	0.005
<i>EFCO</i>	0.038	0.045	0.624	0.24	0.002	0.051
<i>EGTS</i>	0.05	0.025	0.819	0.066	0.008	0.032
<i>EHDR</i>	0.014	0.003	0.971	0.01	0.001	0.001
<i>EKHO</i>	0.08	0.043	0.73	0.075	0.011	0.062
<i>ELEC</i>	0.026	0.009	0.933	0.024	0.003	0.006
<i>ELKA</i>	0.063	0.014	0.863	0.046	0.002	0.011
<i>ELSH</i>	0.021	0.003	0.953	0.021	0.001	0.001



<i>EMOB</i>	0.095	0.053	0.233	0.138	0.008	0.473
<i>EPCO</i>	0.014	0.001	0.981	0.002	0.002	0.001
<i>ESRS</i>	0.094	0.061	0.64	0.092	0.009	0.103
<i>ETEL</i>	0.1	0.057	0.396	0.111	0.004	0.332
<i>HDBK</i>	0.075	0.013	0.864	0.023	0.002	0.023
<i>HELI</i>	0.036	0.029	0.695	0.17	0.005	0.066
<i>HRHO</i>	0.108	0.048	0.558	0.055	0.009	0.222
<i>IRON</i>	0.028	0.004	0.934	0.021	0.003	0.01
<i>KABO</i>	0.025	0.006	0.927	0.037	0.001	0.003
<i>MICH</i>	0.042	0.018	0.897	0.034	0.004	0.005
<i>MNHD</i>	0.065	0.049	0.627	0.167	0.006	0.087
<i>MPRC</i>	0.036	0.005	0.917	0.027	0.003	0.012
<i>NCGC</i>	0.029	0.007	0.94	0.017	0.003	0.004
<i>OCDI</i>	0.086	0.075	0.664	0.086	0.007	0.083
<i>OCIC</i>	0.115	0.063	0.283	0.152	0.012	0.374
<i>ORHD</i>	0.037	0.023	0.666	0.087	0.005	0.183
<i>ORTE</i>	0.234	0.066	0.295	0.107	0.008	0.29
<i>SAUD</i>	0.041	0.023	0.896	0.03	0.003	0.006
<i>SKPC</i>	0.102	0.075	0.597	0.122	0.006	0.098
<i>SMFR</i>	0.025	0.01	0.935	0.024	0.001	0.004
<i>SPIN</i>	0.017	0.001	0.963	0.011	0.001	0.006
<i>SVCE</i>	0.051	0.004	0.828	0.072	0.002	0.044
<i>SWDY</i>	0.096	0.081	0.334	0.174	0.008	0.307
<i>UASG</i>	0.017	0.002	0.971	0.008	0.001	0.001
<i>UEGC</i>	0.019	0.004	0.962	0.011	0.002	0.002
<i>UNIT</i>	0.021	0.006	0.927	0.04	0.003	0.003
<i>VODE</i>	0.048	0.033	0.508	0.157	0.006	0.249
<i>WATA</i>	0.099	0.053	0.696	0.089	0.003	0.06
<i>ZEOT</i>	0.024	0.005	0.944	0.023	0.003	0.002
<b>Average</b>	0.058	0.027	0.759	0.069	0.004	0.082
<b>Median</b>	0.04	0.015	0.864	0.044	0.003	0.017

Table 5 Trading statistics for sample period

Investor Category	Proportion Value Traded in Sample (%)		Proportion of Trades in Sample (%)		Average Trade Size (Number Shares)	
	<i>Buy Side</i>	<i>Sell Side</i>	<i>Buy Side</i>	<i>Sell Side</i>	<i>Buy Side</i>	<i>Sell Side</i>
Domestic Individual	63.75	64.72	83.27	84.72	978	1,038
Domestic Institution	11.7	12.56	4.46	5.54	5,494	3,736
Arab Individual	6.1	6.08	3.88	3.55	2,925	3,782
Arab Institution	4.37	4.16	2.22	1.65	6,261	3,272

Non-Arab Individual	0.51	0.55	0.78	0.39	1,497	1,648
Non-Arab Institution	13.58	11.92	5.4	4.16	4,377	3,360

Table 5 summarizes, in details, the percentages of buy and sell transactions made by the investor groups as proportion of value traded, proportion of trades and average trade size. With total value of shares bought approximating at EGP 853 billion, the domestic investors make up 75.45% of proportion of value traded over the sample firms during the sample period from 2004-2009. Arab and foreign investors, on the other hand, contribute approximately 10.5% and 14.5% respectively. Comparable ratios make up the sell side of the proportion of the total value traded with the domestic investors dominating.

As commonly observed in emerging markets, the domestic individuals in the EGX are the most dominating, by type. The institutional investors are comprised of firms constituting 39%, funds and banks constituting 38% and 14% respectively. As per origin, the non-Arab foreign investors from Europe constitute 67% while those from USA make up 28% of the non-Arab foreign investors.

Individual domestic investors focus most of their trades on the small firms while the foreign investors are more inclined to trade on the large firms. While domestic investors contribute with 87% and 90% of buy and sell trades respectively of the total trades, the trade size of domestic individuals have the smallest trade size. The latter can be explained as lack of possession of trading capital since the average GDP per capita in Egypt is USD 1300 (during the sample period).

## CHAPTER IV

### **Methodology**

#### *4.1 Measure of the Investment Style*

In order to measure the investment style of the different investor groups and decide on which type of investor adopts a momentum trading strategy and which adopts a contrarian trading strategy, the difference in the buy ratio is calculated, which was the measure adopted by Grinblatt and Keloharju (2000) to examine the investor behavior of investors in the Finnish market. The buy ratio is calculated on daily basis for all 46 stocks during the sample period from 2004-2009 for all six types of investors as the buy volume of stock  $i$  on day  $t$  for investor group  $j$  divided by the sum of the buy and sell volumes of stock  $i$  on day  $t$  for investor group  $j$ . To determine the investment style adopted by the different investor groups, the difference of the average buy ratios of past winner stocks and the average of the buy ratios of the past loser socks is conducted for each investor group for each day of the sample. If the difference is positive on day  $t$  then the investor is momentum and if the difference is negative on day  $t$  then the investor is contrarian. The past winners and past losers are determined through calculating the past returns with respect to five different time horizons.

In order to be able to calculate the returns, it is important to aggregate the raw intraday data into daily prices and volume transactions to calculate the total number of shares bought and sold.

Past returns for day  $t$  are computed by analyzing the impact of the return on day  $t-1$  as well as returns between trading days  $t-m$  and  $t-n$  where  $m$  and  $n$  constitute the horizon during which the returns are calculated. I calculate the returns on daily basis according to the five horizons to get an insight into how recent and faraway past returns affect the investor behavior. The five horizons are as follows:

-1 -> returns for the preceding day

(-5, -2) -> returns for the past week excluding the previous day

(-20, -6) -> returns for the past month excluding the previous week

(-120, -21) -> returns for the past half-year excluding the prior month

(-120, -1) -> Returns for the comprehensive previous six months

For each time horizon, the returns of all the stocks are ranked in order to decide the past winner and past loser stocks. The past winner stocks are the stocks that rank in the top quartile of the 46 stocks and the past loser stocks are the stocks that rank in the lowest quartile of the 46 stocks. So for each day  $t$  in each time horizon, for each investor group  $j$ , a positive buy ratio difference (which is the difference between the average of the buy ratios of the top quartile past winner stocks and the average of the buy ratios of the lowest quartile past loser stocks) means the investor was momentum on that day and a negative buy ratio difference means the investor was contrarian on that day. In order to determine the overall trend of the investment behavior of each investor category, the fraction of days for which the buy ratio difference is positive is measured for each of the time

horizons and if the fraction is greater than 0.5, then the investor category is momentum while if the fraction is less than 0.5 then the investor category is contrarian.

#### 4.2 Test Statistics

Following the assumption made in Grinblatt and Keloharju (2000) that for each investor category, on each day, the buy ratio difference has a mean of zero and is independent of the corresponding correlations computed at other dates, I calculate the binomial sign test, which is two-tailed, to analyze the statistical significance of whether the fraction of positive buy ratio differences over all dates  $t$  is 0.5. If the fraction  $\alpha$  of positive correlations is over 0.5, the probability of observing a fraction greater than  $\alpha$  by chance is twice and if the  $\alpha$  is below 0.5 then the probability of observing a fraction less than  $\alpha$  by chance is doubled.

Another assumption made and tested using a z-test statistic is that there is a higher probability of having continuations (buy ratio differences of the same sign in two consecutive days) than reversals (buy ratio differences of different signs in two consecutive days). The z-test statistic used is as follows:

$$Z = \frac{x - \frac{1435}{2}}{\frac{n}{11} + [(2p - 1)^{n+1} - n(2p - 1)^2 + (2p - 1)(n - 1)]/46(1 - p)^2}$$

where  $p$  is the observed proportion of continuations,  $x$  is the positive buy ratio differences and  $n$  is the total number of observations for each investor category. The assumption is that the observed fraction of continuations (versus reversals) is the true probability of continuation under the null hypothesis that  $x=n/2$ .

An AR (1) adjustment to the binomial sign test is computed in order to control for the timing of the execution of orders in the market. Some orders for investors in each category will be market orders that are executed in day  $t$  while some might be market orders placed after the closing session of the market and so executed day  $t+1$ . Through testing the residual of AR (1) regression of buy ratio differences on its lagged buy ratio differences for all investor categories in all time horizons for nonparametric autocorrelation.

A correlation between the day  $t$  market returns and the day  $t$  buy ratio differences is conducted to examine whether the movements in the market affect the purchases and sales of the different investor classes. A further step to confirm the findings of the correlation is conducting a regression of the buy ratio differences of the different investor groups for each of the time horizons on the market return and the lag of the market returns. The significance of such a regression will confirm if the market returns affect the purchases and sales of the different investor groups.

#### *4.3 Adjustment for Alternative Interpretations*

To control for the possible criticism that certain investor categories might be passive buyers (sellers) of the same stocks over the sample period, ‘mean-adjusted buy ratio differences’ are calculated. The reasons for such alternative interpretation, that could be especially true for foreign investors, is that investors in certain categories might be passively trading just because they are familiar with the specific firm especially if it is listed in another international market, which is true for some stocks in the sample used. The mean-adjusted buy ratio difference calculates the deviation of the buy ratio of an

investor class on day  $t$  for a specific stock by subtracting the average buy ratio for investor class  $j$  for stock  $i$  over the sample period excluding an interval of  $t-120, t+120$  from the typical buy ratio for investor class  $j$  on day  $t$  for stock  $i$ . The excluded period of six-month of past returns from the average buy ratio is to ensure avoidance of behavioral patterns.

## CHAPTER V

### Results and Conclusion

#### 5.1 Results

The results present the fraction of positive daily buy ratio differences for the six investor categories during all of the five time horizons along with the significance level of the a two-tailed binomial sign test that the fraction of positive differences is 0.5.

Table 6 Analysis of momentum and contrarian behavior categories using unadjusted buy ratio differences

Investor Category	Proportion of positive buy ratio differences					Binomial test <i>p</i> -value				
	Past performance period (days)					Past performance period (days)				
	-1	-5,-2	-20,-6	-120,-21	-120,-1	-1	-5,-2	-20,-6	-120,-21	-120,-1
Domestic Individual	0.224	0.315	0.402	0.429	0.423	0	0	0	0	0
Domestic Institution	0.394	0.431	0.499	0.523	0.531	0	0	0.937	0.101	0.027
Arab Individual	0.403	0.419	0.507	0.524	0.531	0	0	0.614	0.08	0.027
Arab Institution	0.518	0.548	0.577	0.535	0.503	0.187	0	0	0.012	0.826
Non-Arab Individual	0.507	0.552	0.556	0.548	0.553	0.635	0	0	0	0
Non-Arab Institution	0.654	0.676	0.644	0.588	0.551	0	0	0	0	0

As can be seen in table 6, domestic individual investors adopt a contrarian investment style throughout all the sample period while the non-Arab investors exhibit a momentum investment style across horizons. This is consistent with Grinblatt and Keloharju (2000), who shows that individual domestic investors tend to buy past winners and sell past losers while on the other end of the spectrum, foreign investors tend to buy past winners and sell past loser which is consistent with momentum. This is only consistent with the fact that the less sophisticated the investor category is, they adopt more contrarian investment behavior and the more sophisticated the investors are, the more they tend to



adopt a momentum strategy. At the six-month past-return domestic individual investors can be seen to have a positive buy ratio difference for 42.3% percent of the trading days with high significance. This means that for the remaining 57.7% of the trading days, they exhibit contrarian investing. Non-Arab foreign institutional investors exhibit momentum trading for 55.1% of the trading days with high significance at the six-month past-return period. With domestic institutional investors being more sophisticated than domestic individual investors, they exhibit momentum investment with having positive buy ratio difference for 53.1% of the trading days over the six-month period. However, in the other time horizons, they exhibit contrarian trading but to a lower extent than that of domestic individual investors with the monthly (excluding the prior week) and the six-month (excluding the prior month) showing insignificant values of border contrarian and momentum behaviors respectively. As for the foreigner being the most sophisticated investors, the Arab investors are less sophisticated than the non-Arab foreigners, however, they are still more sophisticated than the domestic investors. The Arab institutional investors adopt a momentum investment style more than the Arab individual investors. Non-Arab institutional investors are significantly momentum for all time horizons with positive buy ratio differences ranging between 55.1% and 65.4% of the days trading. With the majority of the non-Arab foreign investors being Americans and Europeans, they are more experienced in international markets than the rest of the investor classes which might explain their ability to have good market timing, good stock picking abilities to adopt a momentum trading strategy where they buy past winners and sell past losers.

After constructing the mean-adjusted buy ratio differences in order to rule out the alternative interpretations that investors might be buying or selling passively, table 7 shows that the results of the mean-adjusted buy ratio differences are very similar to the results in the unadjusted buy ratio differences table.

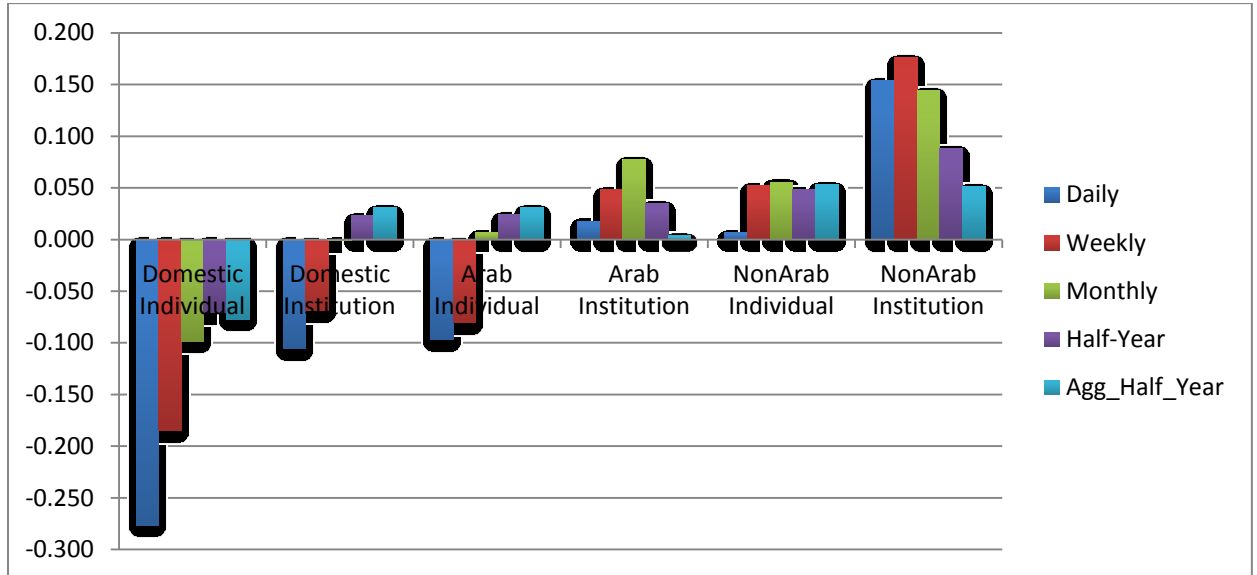
Table 7 Analysis of momentum and contrarian behavior categories using mean-adjusted buy ratio differences

Investor Category	Proportion of positive buy ratio differences					Binomial test p-value				
	Past performance period (days)					Past performance period (days)				
	-1	-5,-2	-20,-6	-120,-21	-120,-1	-1	-5,-2	-20,-6	-120,-21	-120,-1
Domestic Individual	0.223	0.292	0.351	0.464	0.479	0	0	0	0.009	0.137
Domestic Institution	0.280	0.306	0.359	0.444	0.461	0	0	0	0.000	0.005
Arab Individual	0.360	0.338	0.443	0.513	0.519	0	0	0	0.352	0.168
Arab Institution	0.466	0.439	0.464	0.490	0.470	0.010	0	0.007	0.477	0.032
Non-Arab Individual	0.446	0.446	0.465	0.517	0.515	0	0	0.009	0.229	0.295
Non-Arab Institution	0.643	0.605	0.584	0.490	0.513	0	0	0	0.477	0.378

The following figure 2 shows the proportion of positive buy ratio differences less 0.5 for all investor classes for all horizons in order to have a clearer image of which investor categories exhibit momentum investing behavior and who exhibit contrarian investing behavior. As can be seen in figure 2, domestic individual investors are completely contrarian investors while on the other end; non-Arab foreign investors are momentum investors with institutional foreign investors higher in the extent of their momentum investments. Consistent with Grinblatt and Keloharju (2000), “the tendency to be momentum oriented or contrarian oriented is generally quite large across both recent short past-return horizons as well as more distant and longer past-return horizons”. Moreover, the propensity of the investment style is consistent in the sign. For example, in only two horizons, the domestic institutional investors exhibits momentum trading proving they are less contrarian than the domestic individual investors, and in the short past-return horizon, the Arab individual investors exhibit contrarian investment tendency,

which is consistent with the view that individual investors are less sophisticated than institutional investors.

Figure 2 Proportion of positive unadjusted buy ratio difference -0.5



The result of the autocorrelation nonparametric test for the residual of the AR (1) regression shows that the probability of sign reversal in consecutive residuals is virtually identical to the probability of continuation in the sign. Meaning, the proportions of reversals in the signs of consecutive residuals are not very different from 0.5 at the 5% level proving that AR (1) is a sufficient measurement of the buy ratio differences process.

The correlation between the day  $t$  market returns based on the six-month past return and the day  $t$  buy ratio difference is shown in table 7. There is no significant correlation between the market return and the buy ratio differences for any of the investor types, which means that the overall market movements have no effect on the purchases and sales.

Table 8 Correlation between buy ratio differences and market returns based on six-month past return

	EGX30	Dom_Ind	Dom_Inst	Arab_Ind	Arab_Inst	N-Arab_Ind	N-Arab_Inst
EGX30	1	0.378	0.228	0.382	0.168	0.285	0.023
Dom_Ind	0.378	1	0.176	0.224	0.065	0.161	-0.027
Dom_Inst	0.228	0.176	1	0.268	0.329	0.271	0.340
Arab_Ind	0.382	0.224	0.268	1	0.220	0.248	0.054
Arab_Inst	0.168	0.065	0.329	0.220	1	0.251	0.372
N-Arab_Ind	0.285	0.161	0.271	0.248	0.251	1	0.142
N-Arab_Inst	0.023	-0.027	0.340	0.054	0.372	0.142	1

In order to confirm the results of the correlation, I conduct a regression of the six-month past returns of the buy ratio difference of each investor group on the six-month past return of the market (EGX30) as well as the lag of the six-month past returns of the market<sup>3</sup>. The coefficients for the market return and the lag on the market returns were insignificant showing no effect of the market on the buy ratio differences which means that each investment styles adopted by the different investor classes are not affected by the movements in the market.

## 5.2. Conclusion

Through analyzing the investment style of the different investor groups who are classified according to origin and type, this paper becomes the first in the MENA region to use unique and detailed transaction dataset from the Egyptian Stock Market during the period from 2004-2009 to match the different investor classes with their investment strategy. The non-Arab foreign investors comprise the investor type who adopts a momentum trading strategy the most. They tend to buy past winners and sell past loser across the timeline of different intervals in six-month period of past returns. These investors are the most sophisticated investors in the market. On the other hand, the

<sup>3</sup> For more details on the regression results, see the appendix

individual domestic investors comprise the investor type who adopts a contrarian trading strategy through buying past losers and selling past winners, which can be attributed partly to their lower level of sophistication. Between the levels of pure and extreme contrarian behavior and the extreme momentum behavior, the rest of the investor types fall in between these two extremes with domestic institutional investors exhibiting less contrarianism and a little more momentum behavior and the Arab investors exhibiting some contrarianism, but mainly adopt a momentum behavior, however, not as strong as the non-Arab investors. Institutional investors are more sophisticated than individual investors and hence are more momentum across the different investor origins.

The limitation of this paper is that the only measure of investment style used was the buy ratio difference that is based solely on past returns. It will be a further confirmation to use other measures that are based on different factors that might affect the way different investors behave in the market. Moreover, the study was only done for 46 stocks during six years which can be further expanded upon to use more stocks in the market for a longer time period.

Future research can focus on information asymmetry, given how it plays a great role in affecting the international flow of investments as well as how this flow is being invested in different markets. I believe it is important to understand the level of information asymmetry in the Egyptian market to examine whether and how it might affect the Arab and non-Arab foreign investors' trading strategies. Another area for future research could be an analysis of the herding behavior of the different investor classes will also help us understand in more details if investors mimic the investment style of other investor groups or just follow the trades made within their own investment class.

Finally, an examination of the performance of the different types of investors would be an addition to know which investor behavior grants the investor group(s) adopting it to profit. Also, an investigation on how these trading behaviors affect the overall market in terms of liquidity and volatility.

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## APPENDICES

Appendix A: Regression of the buy ratio differences of all investor groups on the market returns and the lag of the market returns base on the six-month past returns

Dependent Variable: DINDHALF\_YEAR\_AGGREGATE  
 Method: Least Squares  
 Date: 05/20/15 Time: 06:15  
 Sample (adjusted): 120 1435  
 Included observations: 1316 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.024576	0.002430	-10.11456	0.0000
HALFYR_AGG_EGX	0.107259	0.084404	1.270783	0.2040
HALFYR_AGG_EGX(-1)	-0.019341	0.084404	-0.229147	0.8188
R-squared	0.142962	Mean dependent var		-0.012615
Adjusted R-squared	0.141656	S.D. dependent var		0.089707
S.E. of regression	0.083111	Akaike info criterion		-2.135008
Sum squared resid	9.069418	Schwarz criterion		-2.123194
Log likelihood	1407.835	Hannan-Quinn criter.		-2.130578
F-statistic	109.5102	Durbin-Watson stat		0.762959
Prob(F-statistic)	0.000000			

Dependent Variable: DINSTHALF\_YEAR\_AGGREGATE  
 Method: Least Squares  
 Date: 05/20/15 Time: 06:16  
 Sample (adjusted): 120 1435  
 Included observations: 1316 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.011569	0.005556	-2.082294	0.0375
HALFYR_AGG_EGX	-0.248037	0.192991	-1.285222	0.1989
HALFYR_AGG_EGX(-1)	0.364746	0.192991	1.889965	0.0590
R-squared	0.054823	Mean dependent var		0.004312
Adjusted R-squared	0.053383	S.D. dependent var		0.195319
S.E. of regression	0.190034	Akaike info criterion		-0.480947
Sum squared resid	47.41641	Schwarz criterion		-0.469133
Log likelihood	319.4634	Hannan-Quinn criter.		-0.476517
F-statistic	38.07866	Durbin-Watson stat		0.976526
Prob(F-statistic)	0.000000			

Dependent Variable: AINDHALF\_YEAR\_AGGREGATE  
 Method: Least Squares  
 Date: 05/20/15 Time: 06:16  
 Sample (adjusted): 120 1435  
 Included observations: 1316 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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C	-0.011793	0.004500	-2.620612	0.0089
HALFYR_AGG_EGX	0.242782	0.156327	1.553041	0.1207
HALFYR_AGG_EGX(-1)	-0.078267	0.156326	-0.500666	0.6167

R-squared	0.145761	Mean dependent var	0.010589
Adjusted R-squared	0.144460	S.D. dependent var	0.166421
S.E. of regression	0.153931	Akaike info criterion	-0.902341
Sum squared resid	31.11141	Schwarz criterion	-0.890527
Log likelihood	596.7405	Hannan-Quinn criter.	-0.897911
F-statistic	112.0206	Durbin-Watson stat	1.472607
Prob(F-statistic)	0.000000		

Dependent Variable: AINSTHALF\_YEAR\_AGGREGATE

Method: Least Squares

Date: 05/20/15 Time: 06:16

Sample (adjusted): 120 1435

Included observations: 1316 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.002723	0.004813	-0.565635	0.5717
HALFYR_AGG_EGX	-0.038729	0.167199	-0.231636	0.8169
HALFYR_AGG_EGX(-1)	0.111664	0.167198	0.667851	0.5043

R-squared	0.028497	Mean dependent var	0.007201
Adjusted R-squared	0.027018	S.D. dependent var	0.166907
S.E. of regression	0.164637	Akaike info criterion	-0.767873
Sum squared resid	35.58922	Schwarz criterion	-0.756059
Log likelihood	508.2603	Hannan-Quinn criter.	-0.763443
F-statistic	19.25732	Durbin-Watson stat	1.124210
Prob(F-statistic)	0.000000		

Dependent Variable: NAINDHALF\_YEAR\_AGGREGATE

Method: Least Squares

Date: 05/20/15 Time: 06:17

Sample (adjusted): 120 1435

Included observations: 1316 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.008146	0.004625	1.761203	0.0784
HALFYR_AGG_EGX	-0.049104	0.160671	-0.305616	0.7599
HALFYR_AGG_EGX(-1)	0.171412	0.160671	1.066849	0.2862

R-squared	0.081911	Mean dependent var	0.024787
Adjusted R-squared	0.080512	S.D. dependent var	0.164991
S.E. of regression	0.158210	Akaike info criterion	-0.847516
Sum squared resid	32.86472	Schwarz criterion	-0.835702
Log likelihood	560.6655	Hannan-Quinn criter.	-0.843086
F-statistic	58.57224	Durbin-Watson stat	1.541970
Prob(F-statistic)	0.000000		

Dependent Variable: NAINSTHALF\_YEAR\_AGGREGAT

Method: Least Squares  
 Date: 05/20/15 Time: 06:18  
 Sample (adjusted): 120 1435  
 Included observations: 1316 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.015297	0.005517	2.772630	0.0056
HALFYR_AGG_EGX	-0.027079	0.191646	-0.141297	0.8877
HALFYR_AGG_EGX(-1)	0.038444	0.191646	0.200598	0.8410
R-squared	0.000561	Mean dependent var		0.016843
Adjusted R-squared	-0.000961	S.D. dependent var		0.188619
S.E. of regression	0.188710	Akaike info criterion		-0.494935
Sum squared resid	46.75776	Schwarz criterion		-0.483122
Log likelihood	328.6675	Hannan-Quinn criter.		-0.490506
F-statistic	0.368650	Durbin-Watson stat		0.812647
Prob(F-statistic)	0.691739			

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