INVESTOR TRADING PATTERNS AND PERFORMANCE BEFORE, DURING AND AFTER TWO CONSECUTIVE CRISES: EVIDENCE FROM EGYPTIAN STOCK MARKET

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UNIVERSITI SAINS MALAYSIA

2019

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by

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Thesis submitted in fulfillment of the requirements
for the Degree of
Doctor of Philosophy

August 2019

ACKNOWLEDGEMENT

I would like to say a very big thank you to the many people in Malaysia, Saudi Arabia and Egypt who so kindly supported this work in many aspects. Exceptional mention goes to my supervisor, Associate Professor Dr. Zamri bin Ahmad. My PhD has been an incredible research journey and I thank Dr. Zamri for that. I appreciate Dr. Zamri's support and encouragement during the time I spent to accomplish my research in USM. Without his academic guidance and overcoming obstacles, this thesis would not have been achievable.

Similar reference goes to Dr. Abdullah Dahlan, who has been supporting me at all levels and special thanks are due for the inspiration he gave me. I am also enormously appreciative to Professor Sherif Al-Asi, especially for sharing his taxonomic expertise so willingly. Special mention goes to Professor Sohier Hegazy who enriched my statistical knowledge and analysis a lot, and for being an asset in this regard.

Many thanks are also due to the finance department in the school of management, USM, for their support which facilitated my work, and also Dr. Walid Ahmed for his valuable input and support. I greatly appreciate the support received during my study from CBA staff members in Saudi Arabia, particularly Dr. Mahmoud Ba-Isa, Dr. Salah Abunar, Professor Abdulhameed Mahbob, Dr. Abdulmajeed Alsadek, Professor Ayman Al-Temsahy, Dr. Ayman Zerban, and Dr. Hatem Garamoon.

Finally, but by no means least, thanks go to my late mother, my late father, my brother and two sisters, and off course my beloved wife and my 4 children for their almost unbelievable support. They are the most important people in my world and I dedicate this thesis to them.

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LIST OF TERMINOLOGIES

Adaptive market hypothesis; AMH	An approach which takes into consideration an evolutionary perspective of human behavior that influences the informational efficiency of markets. (Lo, 2004)
Anchor effect	Strong mental attachment to a particular price; investor sells based on the price he/she bought. (Hirschey & Nofsinger, 2010)
Arbitrageurs	Opportunity hunters, when an asset is overpriced they sell it and search for underpriced asset normally with the same risk but in different market. (Shiller, 2000)
Behavioral finance	Chains of psychological and social theories with financial models to explain the price fluctuations in financial markets which arise independent of asset price fundamentals. (Jegadeesh & Titman, 2001)
Cognitive biases	A rule of thumb that may or may not true. (Barberis, Shleifer & Vishny, 1998)
Contrarian (negative feedback)	Buying assets which have made the worst returns over the previous years, and selling assets which have performed well over the same period. (DeBondt & Thaler, 1985)
Conservatism	The act of depending on prior knowledge in taking new decisions. (Zwiebel, 1995)
Disposition effect	Realizing losses more than appreciating profits. (Shefrin & Statman, 1985)
EGX	Egyptian stock exchange
Efficient market hypothesis; EMH	An investment theory which claims that the market reacts to new information instantaneously, and that past information cannot be used to predict future trends, consequently no investor can beat the market. (Fama, 1970)
Feedback trading	Employing historical prices, trends and personal experience when buying and selling. (Hirshleifer, 2001)
Feedback trading patterns	A strategy (method) employed to make use of historical movements of security prices (i.e. momentum, contrarian, herding).

	(Hirshleifer, 2001)
Herding	Actions when investors discard their own information and imitate others in buying and selling equities. (Chang, Cheng & Khorana, 2000)
Investor overreaction (underreaction)	Investor buying or selling an asset in a price which disproportionately reflects the new information about this asset. (Daniel, Hirshleifer & Subrahmanyam, 1998)
Limits to arbitrage	The limitation of investors to exploit the arbitrage opportunity that appears in the market because of arbitrageurs' irrationality. (De Bondt, Muradoglu, Shefrin & Staikouras, 2008)
Liquidity providing	Buying when asset prices are declining and selling when asset prices are increasing. (Kaniel, Saar & Titman, 2008)
Loss aversion	In general, people perceive avoiding losses more than acquiring gains. (Kahneman & Tversky, 1979)
Market anomalies	Discovered pattern of abnormal market returns that is unexplainable by efficient-market hypothesis. (Hirschey & Nofsinger, 2010)
Market crisis	Market distress that achieves abnormal losses for a period of time normally days or months. (Pompian, 2012)
Market maker	Dealers who buy or sell securities from their own inventories, thereby ensuring that there is always a market in which investors can buy or sell their securities. (Hirschey & Nofsinger, 2010)
Market state	The condition that market prices are trending (i.e. up, down, bubble, calm, crisis, complete breakdown, suspended). (Shiller, 2000)
Market volatility	Dispersion of a certain market index as measured by standard deviation or variance (Verma & Verma, 2007)
Mental accounting	Separating each asset in different account in user's mind. (Shefrin & Statman, 1985)
Momentum (positive feedback)	Buying recent winners and selling recent losers. (Jegadeesh & Titman 1993)
Overconfidence	Overweighting of self-knowledge, maximizing the ability to

	control events and disparage risk, overall considering that investor's skills exceed others' skills. (Barber & Odean, 2001)
Price fundamentals	The qualitative and quantitative information that contributes to the financial valuation of a security. (Jegadeesh & Titman, 2002)
Price limit	Regulatory tools in equity markets in which further trading is prevented for a period of time with the intention of cooling market traders' emotions and reducing price volatility. (Farag, 2015)
Projection bias	The investors' assumption that their preferences will be constant over time. (Pompian, 2012)
Prospect Theory	Also known as loss-aversion theory, it assumes that losses and gains are valued differently, and thus individuals make decisions based on perceived gains instead of perceived losses, the general concept is that if two choices are put before an individual, both equal, with one presented in terms of potential gains and the other in terms of possible losses, the former option will be chosen. (Pompian, 2012)
Random walk	Stock prices move arbitrarily, hence the asset past prices cannot predict its future value. (Fama, 1970)
Rational investor	An investor who maximizes the profit or utility when taking investment decision by employing all available information. (Pompian, 2012)
Regret avoidance	The act of not accepting the bad investment decision made to avoid the unpleasant feelings. (Pompian, 2012)
Representativeness	The anticipation of future performance in the absence of reliable evidence. (Pompian, 2012)
Risk aversion	When return is equal, investor choose less risky security to invest in. (Pompian, 2012)
Sentimental decisions	Decisions which are taken based on emotions, i.e. feelings and thoughts, instead of rational factors. (Pompian, 2012)

CORAK URUSNIAGA DAN PRESTASI PELABUR SEBELUM, SEMASA DAN SELEPAS DUA KRISIS BERTURUTAN: BUKTI DARI PASARAN SAHAM MESIR

ABSTRAK

Mesir dikejutkan oleh krisis kewangan global 2007/2008, dan terkesan dengan kuat oleh krisis politik domestik. Walaupun EGX adalah satu pasaran baru muncul yang aktif dan berpotensi seperti digambarkan oleh Niemezak & Smith (2013) hal ini menunjukkan bahawa EGX bukan sahaja tidak cekap tetapi juga rapuh dan terdedah kepada krisis. Oleh itu, adalah dijangka ramai pelabur lebih berinformasi, dan adalah berbaloi untuk mengkaji kes-kes sebegitu dalam konteks krisis, terutama dalam kekacauan politik. Menggunakan aspek kewangan perilaku, kajian ini bertujuan untuk mengenalpasti corak urusniaga (contoh momentum, kontrarian) dan prestasi niaga jual dan beli yang dibuat oleh pelbagai jenis pelabur (contoh individu domestik, institusi domestik, individu antarabangsa dan institusi antarabangsa) semasa dan bukan semasa krisis. Set data pengaliran masuk dan keluar harian pelabur dikutip dari Januari 2006 sehingga Disember 2016. Vektor Autoregressive (VAR) digunakan untuk mengesan urusniaga maklumbalas, dan kemeruapan (menggunakan ujian Wald), manakala kaedah Kamesaka et al. (2003) digunakan untuk mengukur prestasi setiap kategori pelabur. Hasil kajian menunjukkan strategi urusniaga yang digunakan oleh empat kategori pelabur semasa tempoh krisis berbeza dari yang digunakan semasa tempoh bukan krisis. Kedua, momentum dan kontrarian digunakan secara berleluasa, tetapi dalam tahap ketegangan berlainan. Selain itu, pelabur institusi antarabangsa menjadi pemenang, dalam lima sub-tempoh, manakala pelabur individu adalah pihak yang hampir sentiasa kalah. Hal ini mencadangkan bahawa urusniaga institusi

antarabangsa adalah didorong oleh informasi, manakala individu adalah didorong oleh perlakuan, seperti dalam Kamesaka et al. (2003). Akhir sekali, didapati bahawa urusniaga kategori pelabur hampir tidak menunjukkan impak terhadap kemeruapan. Secara keseluruhan, dapatan kajian mencadangkan bahawa terdapat informasi tidak simetri kerana prestasi yang pelbagai di kalangan pelabur, seperti dijelaskan oleh Hong dan lee (2011). Oleh itu, lebih banyak usaha dan program oleh pihak berkuasa perlu untuk memastikan terdapat informasi yang cepat dan tepat yang disebarkan kepada setiap pelabur.

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ABSTRACT

Egypt was shocked by the 2007/2008 global financial crisis, and was hit strongly by the 2011 domestic political crisis. Despite the fact that EGX is a promising active emerging stock market, the background of EGX illustrated by Niemczak & Smith (2013) shows that EGX is not only inefficient but also fragile and exposed to crisis. Therefore, it is expected that some investors are more informed and it is worth to investigate such case in light of the two recent crises particularly the political turmoil. Using behavioral finance aspects, this research aims to identify the trading patterns (e.g. momentum, contrarian) and performance of buy and sell trades conducted by different types of investors (i.e., domestic individuals, domestic institutions, foreign individuals, and foreign institutions) during crisis and non-crisis periods. The dataset of investors' daily inflows and outflows is extended from January 2006 to December 2016. The Vector Autoregressive (VAR) is employed to detect feedback trading, and volatility (e.g. via Wald test), while the method of Kamesaka et al. (2003) is employed to measure the performance of each investor category. The results indicate that the trading strategies utilized by the four investor categories during crisis periods differ from those employed during non-crisis periods. Second, momentum and contrarian patterns are heavily employed but in different intense. Further, Institutional foreigners were winners during the five sub-periods while Individual investors were nearly always losers. This suggests that foreign institutions are information-driven while individuals are behavioral-driven as in Kamesaka et al. (2003). Finally, it was found that

investor categories' trading has almost non-existent impact on market volatility. Overall, the results suggested that there might be an information asymmetry because of the varying performance among investors as described in Hong and Lee, (2011). Hence, more efforts and programs should be applied by the authority to ensure the availability of accurate and timely information dissemination to every investor.

CHAPTER ONE

Introduction

1.1 Background and research motivation

The Egyptian economy has experienced uninterrupted economic challenges during the past 50 years. Several efforts have been made since the early nineties of the 20th century to reform the economy in order to maintain sustainable growth. However, this goal has not been achieved yet. Various factors have contributed to abort attempts to revive the Egyptian economy. Among these factors were the two major recent collapses. Both had a negative impact not only by disrupting reforms, but also by the decline of the Egyptian economy much more than it was previously. The global financial crisis of 2007/2008 and the political turmoil of 2011 stroke the Egyptian economy hard.

Numerous sources of Egypt's income have been affected negatively by these two crises. A considerable number of macroeconomic indicators fell drastically, for example: the GDP growth rate collapsed hugely from 7.2% in 2008 to 2.2% in 2011. To more of an extent, the political crisis specifically triggered significant socio-economic troubles. A rapid devaluation of the Egyptian pound forced the Egyptian pound to fall and lose 75% of its value. Fuel, food, and all necessary goods were inflated to exorbitant level. The poverty rate increased and 40% of the population lay under the poverty threshold. Meanwhile, performance of the Egyptian financial system almost malfunctioned in response to the political turmoil. The Egyptian stock market: EGX, was not an exception, all its macro indicators fell to unprecedented levels.

As a matter of fact, EGX is one of the effective arms in the Egyptian financial system. It was the first stock market to be established in the Arabian region, being established in

1883. Furthermore, EGX is one of the largest emerging North African stock markets. EGX is also classified as a member in the CIVETS group (e.g. Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa). This group of stock exchange markets is described as being dynamic and diversified, relative to the other emerging markets. Perhaps because of the no capital gains tax on the profits of its investors, EGX is the third cheapest market in the Middle East and North Africa region. That is why major financial funds are enticed to invest in EGX. For instance, the Norwegian Pension Fund, the world's largest sovereign fund, invests aggressively in EGX.

As mentioned above, during the two crises of 2007/2008 and 2011, all the main indices of the EGX fluctuated sharply. The EGX 30 index, a free-float capitalization weighted index of the 30 most active stocks in terms of capital and liquidity, dropped by 56% in 2008. Market capitalization as a percentage of the GDP dropped from 105% in 2007 to 45% in 2008. Conversely, trading ratios made surprising jumps during the same period, as the total value of traded stocks leaped by 45%, and the total volume went up by 69%. Moreover, turnover ratio had a quantum rise of 82%, and traded value increased by 46%.

In 2011, the Egyptian market witnessed a momentous decline due to the political repercussions and consecutive economic events that occurred both internally and externally. With no exception, all market indices collapsed during 2011. The EGX 30 declined by 49%, total traded value dropped by 53%, market capitalization went down by 40%, market capitalization as percentage of GDP sharply declined by 53%, a number of transactions fell drastically by 44%, the average daily value traded dropped by 45%, total volume traded plunged by 44%, and the turnover ratio decreased by 28%.

Table 1.1 shows some of the EGX indicators pre, during and after the two crises of 2008 and 2011, and figures 1.1., 1.2, 1.3 are the calculated percentage of

change compared to the preceding year for three of these market indicators: volume, turnover, and average daily value traded, EGX 30 index.

Table 1.1 EGX Aggregate indicators (2006-2015)

EGX Indicator	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EGX 30 (end of year)	6973	10550	4596	6209	7142	3622	5462	6783	8927	7006
Market Capitalization (end of year in billion pounds)	534	768	274	500	488	294	376	427	500	430
Market Capitalization (% GDP)	73	105	45	41	40	19	24	24	25	22
Number of Transactions (million transactions)	6.8	9	13.5	14.6	10	5.6	6.2	4.8	7.3	4.9
Average Daily Value Traded (million Egyptian pounds)	1176	1488	1656	1822	1300	716	755	666	1192	1014
Total Volume (billion shares)	9.1	15.1	25.5	36.6	33	18.5	34	29	57	45
Total Value Traded (billion Egyptian pounds)	287	363	529	448	321	148	185	162	291	248
Turnover Ratio (%)	48.7	38.7	70.3	49.9	42.9	34	34	27	38	27

Source: Egyptian exchange annual reports (2006-2013)

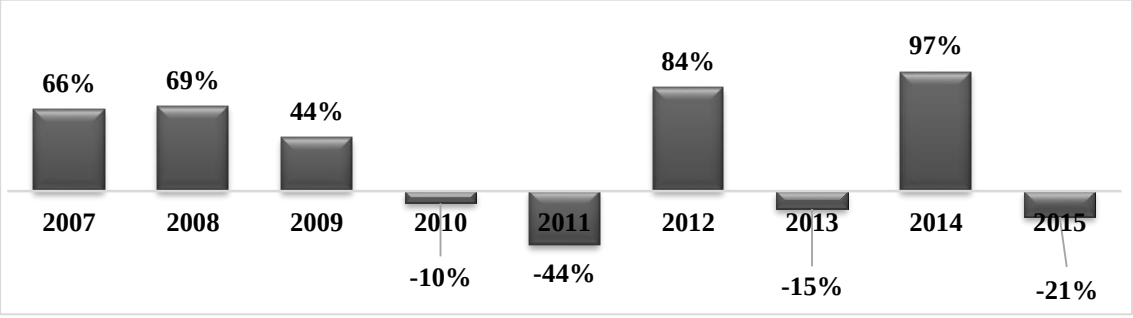

Figure 1.1 Percentage of change in volume traded (2006-2015)

Source EGX annual reports

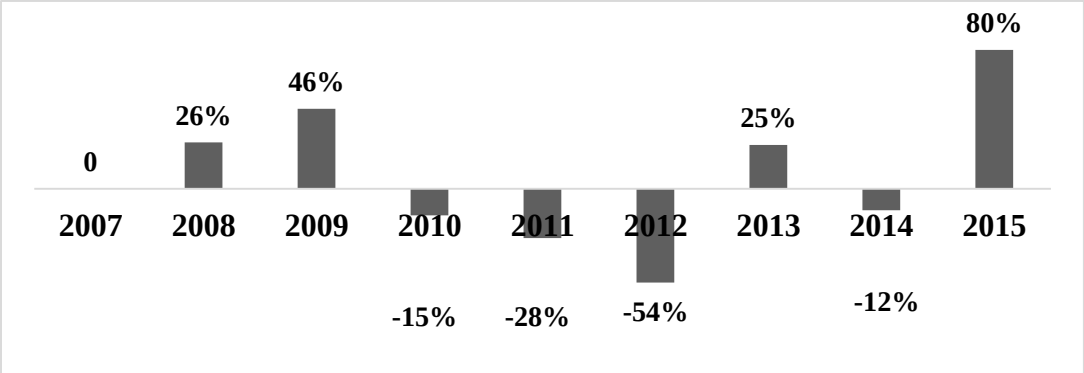

Figure 1.2 Percentage of change in turnover (2006-2015)

Source EGX annual reports

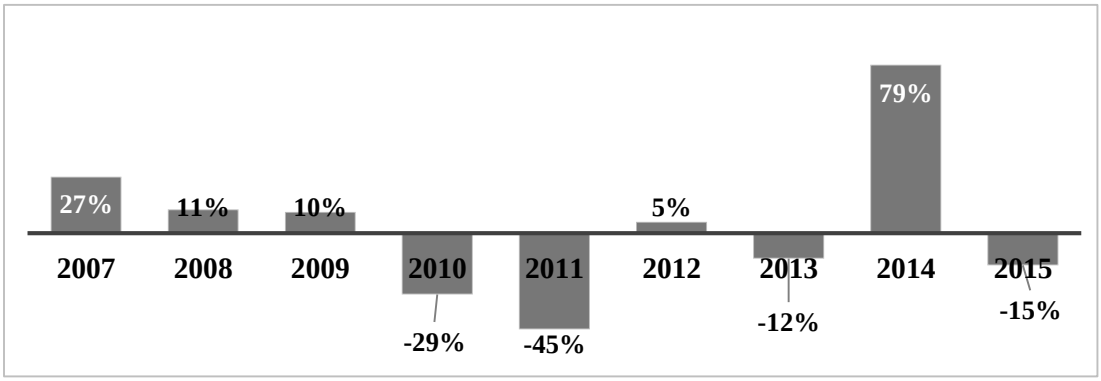

Figure 1.3 Percentage of change in average daily value traded (2006-2015)

Source EGX annual reports

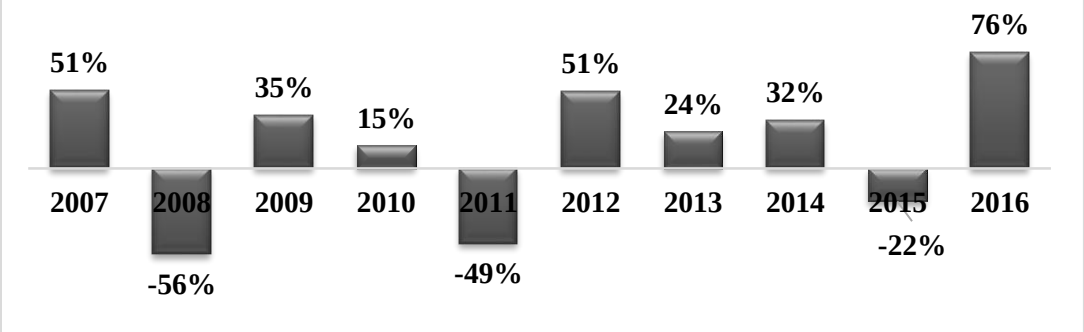

Figure 1.4 Percentage of change in EGX 30 index (2006-2015)

Calculated by researcher

Table 1.1 and figures 1.1, 1.2, 1.3, 1.4 highlight some important observations. First, in general, EGX index show sharp swings (e.g. the average of the yearly change in the index

throughout the seven illustrated years is above 30%; out of the ten years, 7 years changed by 35% and 4 of them are around 50%). Second, 2008 experienced the brunt of the shock of the global financial crisis. That is reflected by the severe drops in the EGX capital and index. On the other hand, the trading activity ratios express hyperactive moves by investors, which may reflect the superfluous activity of investors or endeavors of some investors to create a demand so as to raise the price of certain assets to achieve rapid profits, to the detriment of other investors. For example, in figure 1.1 the volume traded in 2008 was increased by 69%. That increase is also applicable during 2009 by 44%. However, in 2011, all indicators dropped acutely. This suggests that investors withdrew suddenly from the market, without taking any maneuvers.

Third, while there was a decline in all activity ratios in 2010, the market index rose. This could be accounted for the existence of market reversal chasers who were looking for undervalued assets remaining from the 2007/2008 drop and who employed a buy and hold strategy, which afforded liquidity and created demand to the overall market. This scenario raises many questions about the variability of the information obtained by investors. The following figures 1.5 and 1.6 illustrate the value traded ratio for each investor category.

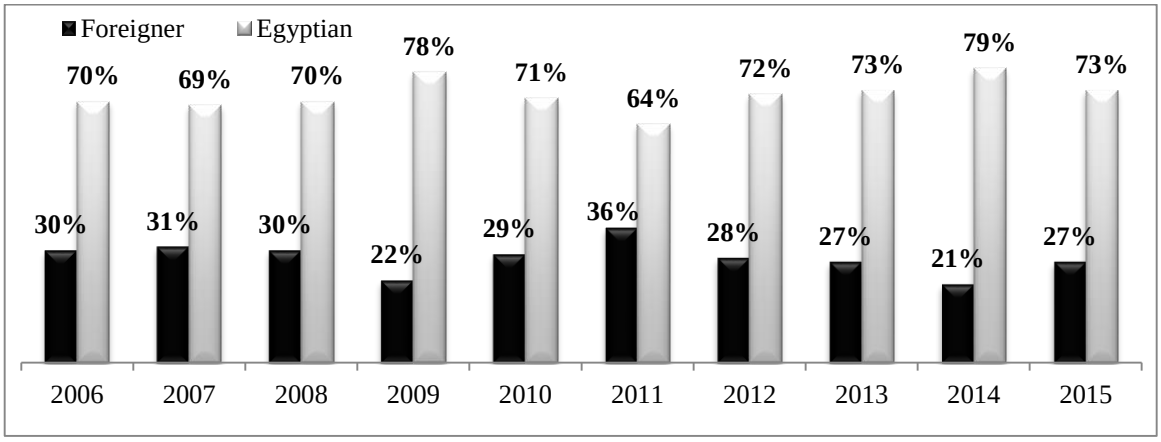

Figure 1.5 Egyptian vs. Foreigners % of total value traded

Source: Egyptian exchange annual reports

Figure 1.5 shows that Egyptians dominate the EGX, however in the rebound years of 2009 and 2012 they increased their value trading ratio compared to other years (e.g. 11% in 2009 and 8% in 2012). Meanwhile, the market index leaped. May be because of overweighting recent prices, it seems that Egyptians pushed the market after both crises, which may account for the existence of representativeness (e.g. the anticipation of future performance in the absence of reliable evidence). More likely, the existence of representativeness motivated investors to practice feedback trading (e.g. momentum and contrarian) (Shefrin, 2008). Conversely, foreigners were more active during both crises, and even made their trading ratio increase in 2011.

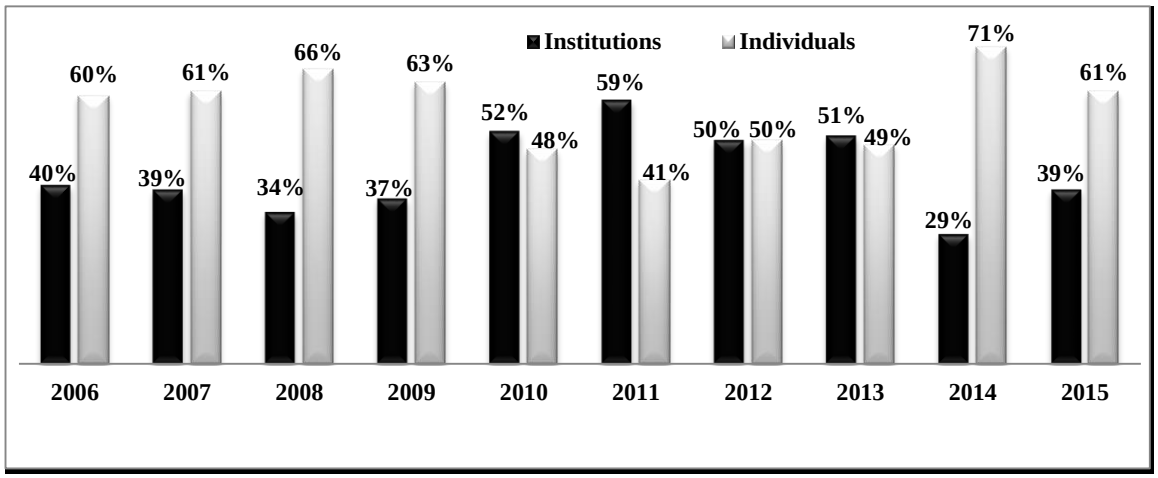

Figure 1.6 Traded institutional investors vs. individuals % of total value traded

Source: Egyptian exchange annual report

Figure 1.6 illustrates that individuals were market dominators up to year 2009, after which institutions took the lead. In 2008, individuals and institutions nearly kept their position with regards to how they traded, while through the years 2010-2013 institutional investors changed their strategy and traded more heavily to maintain market stability. That was not the case in 2014 and 2015 when Institutional investors shrank their portfolio to almost half, leaving individuals to dominate the market. The previous results uphold that

investors behaved differently, and that the possibility of information asymmetry was rather high.

The above figures, by and large, imply that both crises were not identical regarding investors trading behavior. To explain briefly, the 2008 crisis was global in nature while 2011 crisis was domestic, originating from political unrest. Adding to this, the micro and macro country indicators drastically dropped during and after the political unrest of 2011. However, that was not the case during and after the 2007/2008 crisis. Therefore, determining the trading behaviors of different investor categories will provide appropriate recommended procedures to fill the gap in information present among investors. Nevertheless, a more in-depth statistical investigation may reveal more clarifications. Various factors affect the expected results, such as overall market efficiency, investors' information level as well as the nature of EGX. It is very important here to highlight that investor categories' performance can be used as a proxy for determining investors' informational level as well as the degree of investor's sophistication as argued by Lee (2011).

Despite the fact that EGX is a promising active emerging stock market, the background of EGX illustrated by Niemczak and Smith (2013) shows that EGX is not only inefficient but also fragile and exposed to crisis. Additionally, EGX weak efficiency violations have been documented, for example: (Omran and Farrar, 2006; Boubaker and Makram, 2012; Aloui and Nguyen, 2014). Hence, the sharp rebounds of EGX imply that the amount of information obtained by buyers and sellers varies across the investor categories.

Behavioral finance models always blame investors' information asymmetry to explain overall market inefficiency. Therefore, it is possible to interpret previous figures by

assuming the lack of information to one or more investor categories in EGX. After all, there has to be both substantial winners and losers in EGX; however, they are still unknown due to the lack of studies in this area. That overall snapshot of investors' trading behavior may explain the disparity of investors' rationality, and accordingly clarify the EGX inefficiency. This directly raises many questions about the two crises, particularly the aftermath of the political turmoil. Fortunately, prior studies of behavioral finance models empower such an exhaustive analysis.

Behavioral finance can be seen as combining psychological and social theories with financial models to explain the non-financial aspects that affect investor's decision. Indeed, these decisions may lead to price fluctuations which are independent of asset price fundamentals. Therefore, behavioral finance considers the impact of psychology on the behavior of financial decision makers and investors, as well as the consequent impacts on the overall market. Several models pay attention to investors' trading pattern as a means to explain investors' financial decisions. Among the most recurrent trading patterns exhibited by investors, particularly the less-informed investors, is feedback trading model (Tayde and Roa, 2015).

Feedback trading can be seen as employing historical prices, trends and personal experience when buying and selling (Hirshleifer, 2001). Feedback trading has two main investing patterns, which are referred to as momentum and contrarian. Momentum (e.g. positive feedback) is based on buying recent winners and selling recent losers. Investors who adapt momentum in their trading believe on price continuation. Contrarian (e.g. negative feedback or price reversal) investment, on the other hand, involves purchasing shares which have made the worst returns over the previous years, and selling shares which have performed well over the same period.

Barberis et al. (1998) and Hong and Stein (1999) extrapolated a scenario which resolves the apparent conflict between the two trading patterns (e.g. momentum and contrarian) in less efficient market. When any good news arrives to the market, informed investors react somehow slowly (e.g. underreact) to the news, pushing prices upward. Momentum investors recognize the price increase, and decide to follow rational investors and buy the same assets. Prices persist in an upward-direction within 3-12 months, deviating from fundamentals. The market discovers the price deviation based on the level of random walk in the market, and so prices revert to their fundamentals. When bad news arrives to the market, momentum investors exaggerate this news (e.g. overreact) and drive prices down. The reduced assets become undervalued. Contrarian investors buy and hold undervalued assets (within 3-5 years). Hence, momentum and contrarian are created by the underreaction/overreaction of investors to news. Eventually, the price reverts back to its fundamental value due to the random walk mechanism in the market. Of course, in the case of abnormal market settings (i.e. bubble and crisis), rumors and news invade the market and might change investors' trading behavior.

Research into the effect of crisis on investors' behavior explains various investor financial decisions. Part of this dispute concerns investors' patterns pre, during and post crisis. The aim of this research is not only to identify these patterns, but also to find out whether investors engage in the same pattern of behavior (continue, stop or reverse) during different market states (e.g. stable, crisis, bubbles). The diversified findings (i.e. Shiller, 2000; Kim and Wei, 2002; Goodfellow, Bohl and Gebka, 2009; Lin and Lin, 2014) pointed out the existence of intermediate drivers, such as the investors' degree of rationality and market maturity (e.g. frontier, emerging, and developed).

The following scenario illustrates how investors' information and trading patterns may affect markets in many ways during crisis. Before crisis which is normally booming period, more informed investors hide some information they know which make less informed to buy without consideration. This reason exactly was known to create recent mortgage crisis. During crisis the scenario changes, more informed investors create market moves for to the down side, dropping stock below fundamentals so far and buy this asset. Meanwhile very few stocks suffer from momentum waves in the up side, desperate less informed buy these assets to decrease their losses.

Empirical evidence supports the theory that a rationality gap exists between the investors in developed and emerging markets (i.e. Bohl and Brzeszczynski, 2006; Adler, Djigbenou and Sosa, 2016). Obviously, there are studies which indicate that developed markets have irrational investors as well as market anomalies (i.e. feedback, herding, day-of-the-week, seasonality, disposition effect, anchoring), yet irrationality is more prevalent in emerging markets. Rationality inequalities among investor categories are also prominent in emerging markets (Lee, Li and Wang, 2009).

In conclusion, the investors, either Egyptian, foreign, individual or institution, in the study suffered from the contagion of the global financial crisis and the aftermath of the political turmoil (e.g. 5 different Egyptian presidents in 3 years). All these circumstances exist in EGX, which is an emerging, inefficient, small market. Therefore, discovering the trading patterns and performance under such stress is expected to be added value to the current literature.

1.2 Problem statement:

Very few studies documented the situation where a financial market confronts a financial crisis followed by an unconnected political crisis. Unfortunately, this unusual phenomenon took place recently in Egypt. During the global financial crisis of 2007/2008, the main Egyptian stock market index: EGX 30, lost half of its value. Surprisingly, the market activity indicators increased significantly. Conversely, in 2011, during the peak of domestic political turmoil, all market indices, with no exception, dropped drastically, including activity indicators. The obvious dissimilarity of the dynamics of the two crises is quite puzzling.

A financial crisis can be seen as serious market malfunction. Its impact, most of the time, is not as disruptive as the effect of the entire economic collapse resulting from political instability. In Egypt, during the crisis of 2007/2008, the effect was mainly limited to the stock market and a few financial institutions. However, during 2011 and hereafter, the effect spread to include country micro and macro indicators. For example, the Egyptian pound enhanced in 2008, while during the political crisis it lost the majority of its value. Poverty, unemployment, inflation, budget deficit and internal as well as external debit are a few examples of collapsed indicators that followed 2011's political crisis in Egypt. This greatly propagates the belief that not all investor categories have been evenly affected by the two crises.

Investors in EGX consist of various categories. It is expected that their ability to access and interpret information correctly may vary. Some investors may follow the trend of the market and adopt a seemingly irrational behavior, resulting in some phenomena observed in the market, such as the feedback trading. This, in turn, leads to the so-called momentum

buying behavior, which makes the winners continue being winners, and the losers continue being losers. On the other hand, there are also categories of investors who try to bet on price reversals, which lead to the so-called contrarian strategy.

Additionally, picking a trading pattern is relatively sensitive to market settings (Liaoet al., 2013). Normally, during crisis there is panic, chaos and an inclination to exaggerate existing news. The majority of investors are obligated to sell stocks at a depressed value. Simultaneously, very few of the persistent, rational investors interpret the market's sharp decline as a chance to make money. Therefore, during crisis periods, investors possibly adapt their position by softening, abandoning, or intensifying the trading pattern they employed in the pre-crisis period (Hsieh et al., 2011).

As for the profitability of using these strategies, previous studies give rather mixed results. For example, Chung et al. (2015) and Tse (2015) admitted the profitability of the trading strategies employed during crises, whereas Tai (2014) and Teplova & Mikova (2015) found otherwise. It is more likely, in the case of the EGX during both crises, for trading patterns to differ, particularly if the buying and selling are considered separately.

Moreover, investors do not have the same incentives regarding buying and selling (Gompers and Metrick, 2001). Many of them buy shares to gain direct profits. However, the selling decision, especially during crises, is driven by the investor's risk factor and panic reactions to any news. Furthermore, many investors are affected by the disposition effect due to regret aversion (Shefrin & Statman, 1985). The disposition effect occurs when investors are inclined to sell winners too early and keep losers too long (Hirschey and Nofsinger, 2010). This behavioral bias is documented to let investors use different strategies for buying than those for selling (Grinblatt and Keloharju, 2000).

This research investigates the association between market returns and the buying and the selling of four investor categories during 5 sub-periods which two of them are crises sub-periods (e.g. financial and political). Second, volatility and buying and selling of each investor categories are also under investigations. Finally, to detect investors' level of information, the performance of each investor category will be estimated. To the best of the researcher's knowledge, there is no other study that has investigated or linked investor behavior and performance in two consecutive crises, predominantly for small emerging active markets. Second, no empirical investigation has studied how much investors learn from one crisis and to what extent they implement the lessons learned in the following crisis, especially using a large database representing 2655 trading days, which covers 11 years. The reveal of feedback trading patterns practiced in the presence of financial and political crises would answer many underlying questions, particularly if the buying and selling patterns are considered separately. This may trigger policymakers to enhance current rules and procedures in favor of boosting EGX efficiency, as well help to unveil substantial precedents of financial crisis in EGX. Additionally, this may contribute to yielding a model that is able to predict pre-crisis investor behavior.

1.3 Research questions:

It is worth mentioning that the trading pattern term used in this research refers to the method or strategy employed by investor categories when they buy or sell, more precisely, momentum and contrarian patterns On the other hand, the investor trading behavior term refers to the behavior during buying and selling transactions. Hence, regularly being a net buyer or net seller is atypical investor behavior. To probe further into the above issues, the following questions with regard to the Egyptian stock market will be addressed empirically:

1. To what extent do investor categories follow momentum and contrarian trading patterns?
2. Does each investor group's buying pattern differ in different states of the market?
3. Does each investor group's selling pattern differ in different states of the market?
4. Does the trading pattern differ according to the type of crisis (political vs. financial crisis)?
5. Does trading behavior by each investor category have a significant impact on market volatility?
6. Does the performance of various investor categories vary in different states of the market?

1.4 Research objectives:

The main objective of this study is to figure out the trading patterns and performance of the four investor categories during stable and distress market. Therefore, in accordance with the questions posed above, the research seeks to fulfill the following objectives:

1. To examine the level of momentum vs. contrarian patterns employed by the four investor categories, namely domestic individuals, domestic institutional investors, foreign individuals, and foreign institutional investors, in the EGX.

2. To identify the buying pattern (momentum vs. contrarian) of the four investor categories in all market states.

3. To identify the selling pattern (momentum vs. contrarian) of the four investor categories in all market states.

4. To examine whether the trading pattern pursued by a certain investor category differs according to the type of the crisis.

5. To examine the impact of the trading behavior of each investor category on market volatility.

6. To analyze each investor category's performance during different states of the market.

1.5 Research significance:

The Egyptian stock market currently functions in regulatory, institutional, cultural, and even psychological circumstances somewhat dissimilar to those of its mature counterparts. Therefore, a substantial amount of research is still needed to contribute to a better understanding of many issues relevant to investor behavior during both tranquil and turbulent times. As such, the significance of this study can be ascribable to its contributions to the existing literature.

The contributions that this thesis makes to the existing body of literature are six-fold. First, the Egyptian market represents a vastly untapped data source that yields out-of-sample research opportunities, thus providing a greater potential to improve our knowledge of investor trading behavior and performance in different market settings (e.g. financial crisis, political turmoil, non-crisis). Furthermore, in the Arab region, the EGX is considered a major and one of the most aggressively traded Arabian African stock markets, with foreign value trading participation exceeding 25% in the last decade, even during times of crisis. The EGX is also a member in the CIVETS group (e.g. Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa), which are described as dynamic and diversified markets relative to the other emerging markets. As pointed out by (De Groot, Pang and Swinkels, 2012), emerging markets are a prime research target to test investor trading

strategies that have already been documented in developed market settings in order to determine the applicability of these strategies across different financial environments and regimes. To the best of the researcher's knowledge, no research into the trading practices of various categories of investors in different market conditions has been so far conducted.

Second, to the best of our knowledge, this study comprises one of the largest data set for a single emerging market, as the study examines the mutual effect of market returns as well as investor trading over 2655 trading days, which covers 11 years. Hence, the current research employs a unique dataset of equity flows which is classified by the categorization of the seller and purchaser into four investor categories, viz., domestic individuals, domestic institutional investors, foreign individuals, and foreign institutional investors. This classification gives the opportunity to look into the trading pattern exhibited by each investor group on both the buy-side and sell-side. Furthermore, assessing profitability reveals the efficiency of the trading pattern employed. Indeed, many prior studies (e.g., Choe et al., 1999; Kamesaka et al., 2003; Richards, 2005; Ng and Wu, 2007) used different buy-sell imbalance indicators to uncover investor trading patterns. Nevertheless, since investors may engage in trading patterns in buying transactions which are different than those in selling transactions, employing the buy-sell imbalance measures could possibly yield inaccurate results because it limits the researchers' ability to distinguish the behavior pattern underlying buy trades from that underlying sell trades.

Third, the current research explores these patterns in both calm and turbulent periods. To address whether investors psychologically deviate from extreme up/down market state, the current dataset is composed of five sub-periods. The first of these sub-periods is the pre-global financial crisis, which witnessed a bubble-like situation in the EGX, the second

is the global financial crisis, third is the pre-political crisis sub-period, fourth is the political unrest crisis sub-period, and the final sub-period is the post political unrest sub-period. Hence, the first, third and fifth sub-periods represent the non-crises sub-periods, while the second and fourth sub-periods represent two crises sub-periods. The study of sub-periods to address investors' behavior in order to compare their behavior in different market conditions is commonly employed in similar empirical studies (Hong and Lee, 2011).

Fourth, the EGX investors' reciprocal actions towards circumstances such as the long period of demonstrations throughout 2010, the 2 revolutions, and 5 different presidents during three years, from 2011 to 2014, in Egypt is of the importance and should be addressed. Given the visible consequences of political events, knowledge of the extent to which political unrest affects market dynamics is of practical interest to policymakers tasked with monitoring the stability of the financial system. The results may offer important implications for foreign portfolio investors and multinational corporations with investments in Egypt, underscoring the significance of accounting for political risk factors when formulating investment strategies.

Fifth, this research is an attempt to understand the risk of employing momentum and contrarian trading patterns among investors by showing losing strategies and winning ones, along with losing and winning investors. Consequently, this is an attempt to identify which investor category is likely to exhibit information-driven trades and which investor category exhibits poor performance, that is, their trades not likely to be information-driven.

Lastly, the current research will use the multivariate vector autoregressive model: MVAR, to detect feedback trading. To the best of the researcher's knowledge, no previous studies have employed MVAR. Alternatively, they employed the Univariate VAR model.

As shown by Pena and Sanchez (2006) the MVAR models delivered more accurate estimates when compared to the benchmark Univariate VAR model. Another reason why the employed multivariate VAR model outperforms the ordinary Univariate VAR model is that MVAR can detect inter-category relationship. The persistent daily buy (sell) trades of a certain investor category depending on different investor category buy (sell) trades indicates that certain investor categories buy (sell) depending on the buy (sell) of different investor categories in the EGX. Hence, instead of just finding out the mutual relationship between buy (sell) trade patterns of each investor category and market return, this technique gives more insights.

1.6 Research structure:

This research has six main chapters. Chapter 1 is an Introduction which includes an exclusive foreword introducing the problem statement, research hypothesis, objectives, principle questions being investigated, methodology, and research significance.

Chapter Two addresses the performance of the Egyptian economy at the macroeconomic level during the study period. It casts a quick look on the historical indicators as well. Moreover, the chapter illustrates the aggregate attitude of the stock market pre, during, and post-financial crisis, as well as the recent political crisis. Investor categories' buy-side and sell-side performance is demonstrated with an emphasis on the investor categories' decline and rise in both crises.

A literature review is presented in Chapter Three in order to expound, theorize, deduce, and theoretically prove the ideas the research adopted. The chapter differentiates between the financial crisis and political crisis. Moreover, it tackles how the investor behavior affects investment decisions, and also differentiates between rational and irrational

investors. Feedback trading behavior is then presented. Next, the discussion explains the difference between the different investor categories in various market conditions in terms of strategies and performance. And finally, the chapter illustrates the buy-side and sell-side behavioral variation among investors.

Chapter Four explains the methodology utilized by the researcher. The chapter is composed of two main sections. The first is descriptive, including data collection, structure, sampling, characteristics, timing, and cleansing. Moreover, the criteria used to select and determine the sub-periods are presented. The second section states the analytical methods used. Additionally, statistical methods used to measure momentum and contrarian trading patterns are investigated, as well as the investors' performance. Next, the method to calculate market volatility is presented along with the method used to measure the effect of investor's buying and selling on market volatility. The chapter also includes the chosen methods for forecasting and building a model which predicts future behavior of each investor category, for both normal and unstable periods.

Chapter 5 deals with the empirical study and data results. Descriptive statistics for each investor category is illustrated. Moreover, the multivariate properties of daily equity purchases and sales made by each investor category are shown as well as the investor group performance and trading patterns derived from the investigated data. Finally, Univariate properties of market volatility and daily purchases and sales made by each investor categories are illustrated.

Lastly, Chapter Six presents the discussion of the previous results in Chapter 5, and states the conclusion of the study. The chapter is composed of an introduction,

recapitulation, discussion of results, conclusion, implications, and finally study limitations as well as a recommendation for future work.

CHAPTER TWO

Egyptian Stock Market

2.1 Introduction

This chapter is an outlook of Egypt's economy, capital market, and investors trading during recent crises from 2006 up to 2016. The principal objective is to numerically illustrate the trading activities in EGX pre, during, and post both global financial crisis in 2007/08 and regional political turmoil peaked in 2011.

Section 2.2 of this chapter gives an overview of Egypt's current economy and its structure. Egypt recent crises that include the Global Financial Crisis 2007/2008 and the political turmoil of 2011 and their impacts on EGX are presented in Section 2.3. In section 2.4, the anatomy of EGX that includes the sectorial structure, OTC market is presented. Section 2.5 a quick overview of EGX macro indicators follows to briefly examine market's moves. In Section 2.6, a snapshot of investors' trading activities pre, during and post recent crises are introduced. Finally, Section 2.7 adds some concise comparing analysis between EGX and its counterparts of the emerging markets as well as some of the Arabian stock markets.

2.2 Overview of Egypt's economy

Egypt's economy is a multi-sources income; the main sources of income are agriculture, tourism, exports of petroleum products, Suez Canal's revenues, industry, services, and remittances from Egyptian expatriates (central bank of Egypt; CBE, 2004- 2014). The Egyptian economy has experienced consecutive economic challenges during the past 40 years. Several efforts have been put since the early nineties of 20th century to reform the

economy to maintain sustainable growth, but this goal has not been achieved. Efforts employed stressed on monetary and fiscal policies, such as modulating customs' structure, maintaining a stable exchange rate, ameliorating the tax system by sharply dropping income tax rates, and regulating tax administration. Improvements on the economy were witnessed lightly in 2004 onward up to mid-2008. Since then, several macroeconomic factors have sown that the economy has slowed down again. (Egyptian Ministry of Investment 2004-2014).

While industrial and other commodity sectors play an important role (51 percent of GDP), the Egyptian service sector is also crucial to Egyptian economy and represents 49 percent of GDP. Revenues from exporting services, namely tourism, remittances from labor abroad, and Suez Canal represent the greatest sources of national income in foreign currencies. These service sectors are vulnerable since they are significantly associated with the changing global environment (CBE annual reports, 2004-2014), resulting in unstable national economic conditions, which in turn negatively affect the behavior of foreign investors, whether in terms of direct investment or portfolio investment. The collapse of foreign (e.g. predominantly direct) investment, in particular, may also intensify crises' consequences by increasing the cost of equity (Guyot et al. 2014).

Capital market in Egypt is one of the major fund pillars financing companies for many reasons. It combats the very high interest rate offered by banks (sometimes exceeding 15 percent) and the bureaucratic complications required when lending from other financial sources. Upon issuance of Capital Market Act in 1995, many activities, policies, and procedures were recently developed. Also, a new chapter to Investment Guarantees and Incentives Law was added to smooth the progress of investment processes in response to investors’ complaints of the obstacles of the original law. The new chapter sets up a new

authority under the name of the General Authority for Investment and Free Zones (GAFI) to replace the multiple scattered bodies responsible for establishing new companies, thus shortening this process to only 2-3 days at most instead of weeks as was before.

The Egyptian Exchange; EGX is the main arm of the Egyptian capital market. Its origin goes back to the end of the nineteenth century; its official activity was launched in 1888 in Alexandria and then in 1903 in Cairo. Egyptian Stock Exchange was ranked the fifth among the world's most active exchanges in the forties of the twentieth century. In early sixties, coinciding with the nationalization laws, performance of Cairo and Alexandria Stock Exchange (CASE, currently EGX) deteriorated until the national strategies turned towards privatization in 1991. Expounding rules and regulations, simplifying procedures, issuing new legislations (Decree 95 of 1992; Capital Law), were among the efforts made to add a legal framework governing CASE activities (Azab, 2002).

2.3 Egypt recent crises

Recently, two consecutive crises have hit the Egyptian economy and consequently affected financial markets; the financial global crisis of 2007/2008 and regional political turmoil of 2011.

2.3.1 Global financial crisis 2007/2008

The financial global crisis climaxed worldwide in mid-2007; however, the case in Egypt was surprisingly different. Most of Egypt’s economy indicators climbed in 2007/2008 (fiscal year starts in July in Egypt); with a real growth of 7.2 percent against 4.1 percent for the 2003/2004; GDP per capita increased by 5.2 percent in 2007/2008 against just 1.2 percent five years before; and budget deficit of 7.5 percent of GDP in 2006/2007 jumped to 6.8 percent in 2007/2008 (CBE multiple reports 2003-2009).

However, the impact of global financial crisis of 2007/2008 emerged obviously at the third quarter of 2008 and last up to first quarter of 2009 on both economic and financial market levels in Egypt. On the economic level, real GDP growth rate, foreign direct investment, remittances from expatriate workers, Suez Canal revenue, and tourism sharply declined; and an increased deficit in balance of payments was witnessed in 2008 (Central Bank of Egypt multiple reports 2006-2010).

2.3.2 Political turmoil 2011:

Egypt has witness a wave of cataclysmic political events since 2011. A growing tide of public discontent with long-lasting legal and socio-economic grievances has simmered under the surface for years, and eventually boiled over on 25 January 2011. All across Egypt, demonstrations with huge turnout and intensity took to the streets against the deeply entrenched autocracies, demanding genuine reform and regime change. These unremitting pro-democracy protests have ultimately led up to the removal of the long-time then-President Hosni Mubarak from power on 11 February 2011.

Considering its complex intertwined relations with politics, almost all aspects of Egypt's economic activity have not been far afield from such political mayhem. In fact, this tsunami of political unrest has, in turn, set off a chain reaction of negative consequences across many key economic and financial aggregates. For example, economic growth has remained consistently anemic since the January 2011 uprising, with real GDP growth ticking down to only 1.8% in the first half of 2014, in contrast to north of 5% at the end of 2010. The consolidated fiscal deficit has widened to an unsustainable level of 14% of GDP by the end of the 2013/14, placing immense pressure on public debt stock, which consequently has skyrocketed to $283 billion, exceeding the country's GDP by about 4%. The tourism sector, which has long served as the lifeblood of the economy, has been