Evaluation of the Impact of Financial Sector Reforms on Stock Market Efficiency: The Case of Egypt

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Abstract

This thesis aims at contributing to the literature on the Egyptian stock market efficiency by empirically conducting a financial sector reforms impact assessment on the efficiency of the stock market at large as measured by the main index issued by the Egyptian Exchange, and on individual stocks that were impacted with stock market specific reforms at one point of time. Efficiency parameter estimates are conducted on a time-varying basis stemming from the believe that stock markets evolve through time, and so does the level of efficiency. The adopted statistical techniques utilized the Kalman Filters technique to obtain the time-varying efficiency parameters for the autoregressive model at the market and individual stocks level. Other deterministic models would have only resulted in a single point estimate for efficiency which does not render assessing the time-varying impact of reforms on efficiency feasible. The positivism philosophy and a deductive approach has been adopted based on the statistical nature of this research and the well-grounded theories covering the stock markets efficiency.

The financial sector reforms are presented with specific focus on capital markets reforms. Proxy variables have been constructed to capture reforms, with some of those reforms impact being tested on the market level, and others on individual stocks level. The proxy variables construction is based on the trading data obtained from the Egyptian Exchange after segregating the data in such a manner to construct proxy variables that reflects the different reforms, and on the dates of introducing the reform measures.

Ranking the reforms impact on the time-varying efficiency parameter indicated that the implemented financial sector reform program, per se, had the biggest impact on improving the efficiency on the market level, the free float percent to be of a significant positive impact when assessed on both, individual stocks and the market. Another important factor is the presence of wide circuit breakers and price limits for traded securities. The wider the price limits, the greater the positive impact on price efficiency.

Most of the proxy variables yielded results conforming with the prior expectations regarding its impact on the time varying efficiency, apart from few on the market and on the individual stocks levels. Reforms' ranking provides guidance to designing future reform plans as it shows the positive impact of having a clearly identified and announced reform plan, the importance of market depth reforms as represented by the free float of companies, the necessity of not having hindrances for the price adjustment mechanisms, and the importance of having sizable offerings to the public. Liquidity enhancement reforms such as the same-day trading had a positive impact on efficiency on the market level, albeit with a smaller magnitude.

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List of Acronyms and Abbreviations

AMH: Adaptive Market Hypothesis

BoA: Bank of Alexandria

CAPM: Capital Asset Pricing Model

CAPMAS: Central Agency for Public Mobilization and Statistics

CASE: Cairo and Alexandria Stock Exchanges

CBE: Central Bank of Egypt

CMA: The Capital Market Authority

CML: Capital Market Law

EFSA: The Egyptian Financial Supervisory Authority

EGX: Egyptian Exchange

EGX: The Egyptian Exchange

EISA: The Egyptian Insurance Supervisory Authority

EMH: Efficient market hypothesis

ERSAP: Economic Reform and Stabilization Program

ETFs: Exchange Traded Funds

FRA: Financial Regulatory Authority (change from EFSA)

FSRP: Financial Sector Reform Program

FY: Fiscal year

GAFI: General Authority for Free Zones and Investment

GARCH: Generalized Autoregressive Conditional Heteroscedasticty

GDP: Gross Domestic Product

GoE: The Government of Egypt

IAPM: International Asset Pricing Model

IHC: Insurance Holding Company

IPOs: Initial Public Offerings

MBS: Mortgage Backed Securities

MENA: Middle East and North Africa

MFA: Mortgage Finance Authority

MM: Million

MoEFT: Ministry of Economy and Foreign Trade

MoF: Ministry of Finance

MoHUD: Ministry of Housing and Urban Development

MoI: Ministry of Investment

MoP: Ministry of Planning

MSCI: Morgan Stanley Capital Index

MTPL: Motor Third Party Liability

NBFS: Non-bank Financial Services

NPLs: Non-Performing Loans

NYSE: New York Stock Exchange

PM: Prime Minister

SEC: Securities and Exchanges
Commission

SFD: Social fund for Development

SMEs: Small and medium enterprises

SOEs: State Owned Enterprises

SOIs: State Owned Insurers

STP: Straight-through Processing

TOP: Theoretical Opening Price

WB: The World Bank Group

Glossary of Terms

Banking Density	Banking density is a measure used in the banking sector to measure how many thousand persons are being served by bank branches. The lower this measure, the higher the potential banking services penetration and financial inclusion.
MTPL	Motor Third Party Liability is the mandatory insurance for any car owner in Egypt whereby the car owner must buy insurance against potential damage to third parties due to accidents. Its pricing in Egypt is being stipulated by the Ministry of Interior and is being revised every five years.
Closing Prices	This is a one number representing the price of stocks published by securities exchanges to the public and data vendors such as Bloomberg and Reuters. The closing price calculations varies from one exchange to another. It can be the last traded price of the stock, or based on a closing auction, or be the traded volume weighted average for the entire trading session (Volume Weighted Average Price - VWAP) or any other methodology chosen and disclosed by exchanges. Closing prices are usually considered the opening price for the stocks on the next trading session.
Price Limits	This is the maximum permissible price change (increase or decrease) for a stock per day or during a stipulated period. The rate of change is calculated based on the intra- and end of day closing price of the stock calculated based on VWAP in the Egyptian context.

Circuit Breakers	The term used when exchanges suspend trading for a certain period of time on stocks due to its price change exceeding a certain predetermined percentage. This period used to be 30 minutes and was reduced sequentially to 15 minutes and then 10 minutes in the Egyptian market.
VWAP	This is the Volume Weighted Average Price for the traded stocks calculated over the entire trading session. This is used as the closing price of traded stocks in Egypt.
VWAP20	The term used for the variable related to the circuit breakers (±10%) and price limits (±20) thresholds. VWAP20 means that the maximum permissible daily price change is 20%. However, the circuit breaker and price limit are triggered based on the VWAP closing prices and not the order price or last trade price. For example, if the intra-day closing price (VWAP) did not hit the ±10% thresholds, while the last traded price exceeds this threshold, no suspension will take place. The temporary suspension is only to be effected when the VWAP reaches the preset thresholds. Effectively, the *last traded price* of stocks could exceed the price limits threshold if the VWAP is still lagging behind.
ORDER20	The term used for the variable related to the circuit breakers (±10%) and price limits (±20) thresholds. ORDER20 means that the maximum permissible daily price change is 20%. However, the circuit breaker and price limit are triggered based on VWAP and order prices, respectively, and not the VWAP price only. In other words, the Circuit Breakers are triggered when the VWAP changes by more than the stipulated

percentages, however, investors are not allowed to place orders with prices outside the price limits set by the exchange (±20). Effectively, the last traded price of stocks will not exceed the price limits threshold.

ORDER10	The term used for the variable related to the circuit breakers (±5%) and price limits (±10) thresholds. ORDER10 means that the maximum permissible daily price change is 10%. However, the circuit breaker and price limit are triggered based on VWAP and order prices, respectively, and not the VWAP price only. In other words, the Circuit Breakers are triggered when the VWAP changes by more than the stipulated percentages, however, investors are not allowed to place orders with prices that exceed the price limits set by the exchange (±10). Effectively, the *last traded price* of stocks will not exceed the price limits threshold.
PER5	The term used for the variable related to the price limits (±5%). PER5 means that the maximum permissible daily price change is 5% and is based on the order price.
Intra-day (Same day) Trading [T+0].	This is the term reflecting the trading rules allowing investors to buy and sell stocks on the same day without waiting for the normal settlement cycle of T+2. This was a reform measure introduced in the Egyptian market in 2007 and is applied on a selected number of stocks that are deemed to be actively traded by the exchange. The term *Intra* is the term that represents the variable reflecting this reform measures in terms of the value of traded stocks using this mechanism. It is represented as a percentage of total day trading of the particular stock.

Omnibus Accounts	Omnibus accounts are a special type of trading accounts used by asset managers to allocate their purchases of stocks at the end of the trading session. It facilitates trading for asset management firms who are managing client's funds by enabling them to buy an aggregate position - in the name of the omnibus account - of a particular stock(s) and allocating them to each individual client at the end of the trading session. The variable reflecting these types of accounts are referred to as *Omni* which is the value traded of a particular stock or the market using these types of accounts. It is divided by the entire value traded of this particular stock or the market, depending on the analysis.
Pre-open (Discovery) Session	It is an auctioning mechanism adopted by exchanges allowing traders to incorporate orders before the trading session, and should a certain criteria be met, a new opening price for stocks is calculated rather than relying on the last trading session close price as the opening price for the next trading session. The outcome of the session is a new theoretical-opening-price (TOP) that all circuit breakers and price limits are based upon it. The term *DS_TOP* represents the variable reflecting this reform and it is the stock return based on the difference between the last close price of the stock and the TOP if materialized. The economic rational of this auction mechanism is to allow for the swift incorporation of news and information released after the trading session in stock prices before the commencement of the new trading session.

Free Float	This is the percentage of issued shares by companies that is deemed by exchanges to be freely - or available to be - traded for investors. There are thresholds and rules pertinent to the calculation of the Free Float of companies, among which is any ownership by investor that is more than 10% of the issued shares, it is being deducted from the free float. *FF* is the variable used to reflect the percentage of the *FF* of companies on a daily basis.
FIX Protocol	Financial Information Exchange (FIX) protocol is an electronic communications protocol initiated in 1992 for international real-time exchange of information related to securities transactions and markets. It was introduced in the Egyptian market and was an enabler to companies to establish their online trading platforms that is linked - through the brokerage companies – to the exchanges.

1. Introduction to the Research

1.1 Research Motivation

Most prudent economic policy makers in developed and emerging economies, strive to conduct reforms to develop the financial sector given its important role in economies. The financial sector plays an extremely important role in allocating resources efficiently between savers with excess capital without business ideas and no immediate need of this excess capital, and users with business ideas and need of capital. It is argued, as presented later, that the more developed the financial sector is, the more the economy at large benefits from this development and efficiency and long-term improvements in Gross Domestic Product (GDP) growth is witnessed. Furthermore, if the financial sector is inclusive enough to the society at large from a finance, investment and insurance perspectives, the better distribution of income across the society at large. Another important characteristic is for capital and stock markets within the financial sector to be efficient to realize the role of capital allocation and accumulation for countries (Levine and Zervos (1996)).

Stemming from the above, the thesis is motivated with the general proposition of assessing the efficiency of the stock market, as it enables companies to source the needed capital for growth. Having said that, efficiency of stock markets is affected by the economic wide reforms aiming at resolving macro-economic imbalances from the one hand, and by the financial sector reforms from the other hand. The Egyptian government - as will be presented in detail in the various chapters of the thesis - embarked on a comprehensive financial sector reform program (FSRP) on two phases. Phase I covering

the years 2004-2008 and Phase II spanning across 2009-2012. It is worthwhile mentioning that Phase II witnessed a lot of difficulties in its implementation due to the eruption of the international financial crisis by September 2008 and the January 2011 revolution that ousted out Egypt's president at that time and led to significant turbulence on the economic, political and social fronts in Egypt, and the June 2013 revolution that toppled the Muslim Brotherhood regime and aimed at restoring security, political stability and economic development. The FSRP was widely implemented and covered both the banking and the non-banking financial services (NBFS) sectors. The NBFS reforms covered financial leasing, insurance, mortgage finance, factoring and capital market specific reforms.

We have been motivated to conduct this research for various reasons, inter alia; financial sector policy and research gap coverage. The research motivation could be elaborated in the below points:

1) No studies have been conducted to formally and statistically assess how the Financial Sector Reform Programs including specific stock market reforms and measures impacted the efficiency for the market at large or for specific stocks. This is true for either single point estimates of efficiency or for time-varying efficiency estimation. This is despite the observed improvement of the financial sector reforms on the financial soundness of institutions and companies operating in the financial sector, and the improved activity on the stock market in terms of trading volumes during the period of reforms as presented in later chapters.

2) Given than no formal assessment of reforms' impact on market efficiency was conducted, no guidance could be derived or inferred from the implemented reforms to design future reform plans and to prioritize stock market reforms that could have the greatest impact on efficiency. This hinders the capacity of policy makers to further implement stock markets reforms, as the historical ones' impact was not assessed or communicated with market participants and agents. Efficiency improvement is particularly important given the rising understanding of the importance of capital markets in creating a healthier and more resilient middle-income class that ensures the sustainability of economic development and growth. Market efficiency is a key important pillar for capital market development.

3) Limited number of studies assessing the Egyptian stock market "time-varying efficiency" as opposed to single points estimates of efficiency. However, single point estimates of efficiency obtained from adopting deterministic econometric models does not capture the evolvement of efficiency over time. This renders testing the reforms impact on efficiency impossible. The one study covering the time-varying efficiency of the Egyptian stock market aimed at assessing how the Egyptian stock market efficiency varied across the year without specific explanations of the drivers behind this variation. Furthermore, the time-varying efficiency estimation did not cover the evolvement of efficient during the financial crisis or the two revolutions in 2011 and 2013.

4) There is a rising need to have a formal approach to assess and rank the historical impact of reforms, and to use these ranks to guide stock exchanges regarding the business models to adopt in a fast changing and complex financial environment.

Before presenting the research aim, contribution, objectives and literature review on the efficiency of stock markets and the research methodology adopted in this thesis, we believe it would be of paramount importance to present the main developments of Egypt's economy across the years and linking them to the main economic and financial sector reforms that took place to set the ground for the detailed description of reforms and measures in Chapters Four and Five that took place in Egypt in relevance to the financial sector during the FSRPs.

1.2 Egypt's Recent Economic Development

The financial sector should not be considered in isolation of the economic development, economic reforms and the macroeconomic stability of any economy. Accordingly, we will be presenting in this section Egypt's economic history and the reform measures the Government of Egypt (GoE) implemented to restore macroeconomic balances as it is a pre-requisite or at a minimum a requirement, for the successful implementation of any financial sector reform programs.

Egypt was adopting a market oriented, private sector led economy until the 1952 revolution whereby Egypt's economic policy became centrally managed and a wide nationalization move of private sector companies took place and most of the major economic activities were run by the GoE. Prior to that revolution, Egypt's capital markets was vibrant and witnessed significant leaps as will be shown in Chapter Five.

After the 1967 and 1973 wars, Egypt's economy witnessed significant economic pressures, and as an attempt by the GoE to restore economic stability, it endeavoured by late seventies early eighties to change the economic policy making by partially allowing and enabling the private sector to participate in the economic activity. This is considered the first dent in liberalizing the financial sector in Egypt. The liberalization was not a complete one as foreign investors could not have owned 100% of any issued capital of financial sector institutions and almost all laws required that there has to be an Egyptian ownership in those institutions. However, these efforts did not yield the required results and the decline in oil prices and the significant subsidy bill led to significant problems on the macroeconomic fronts in the late eighties.

With the severe economic situation witnessed in Egypt in late eighties and early nineties of the twentieth century as evidenced by Egypt's GDP growth chart (Chart 1.1), the GoE embarked on a reform program with the International Monetary Fund (IMF), namely; the Economic Reform and Structural Adjustment Program (ERSAP). The program aimed at addressing Egypt's main macro-economic imbalances as evidenced by the unsustainable budget and balance of payment deficits. One component of the program covered the reinvigoration of the Cairo and Alexandria Stock Exchanges (CASE) at that time via the issuance of Egypt's Capital Market Law Number 95/1992. The GoE followed this by a privatization program that partially offered several state-owned enterprises (SOEs) through the newly re-invigorated stock market. The GoE aim was to reduce the dependence of SOEs on the state budget, create some privatization proceeds that would enable the government to reduce its budget deficit during the years of reforms, and foster

the participation of the private sector in the economic activity. Another important set of reform measures was to transfer the entities responsible for some of the economic activities from authorities to corporations and the issuance of the Public Sector Companies Law No.203/1991.

Economic activity witnessed an improvement mainly due to the gained competitiveness achieved post controlling the budget deficit from the one hand, and the significant devaluation of the Egyptian pound (EGP) versus the United States Dollar (USD) from EGP/USD 0.7 in late eighties to EGP/USD 3.40 in 1994. However, starting from 1997/1998 Egypt faced several internal and external shocks, namely; 1) the South East Asian Crisis and the significant devaluation of the currencies of Asian Tigers leading to significant loss in Egypt's competitiveness, 2) a terrorist attack on tourists in Egypt affecting tourism revenues adversely, and 3) the slowdown in worldwide economic growth during the buildup to and after the dotcom bubble burst.

Chart 1.1: Egypt's GDP Growth Rate (%)
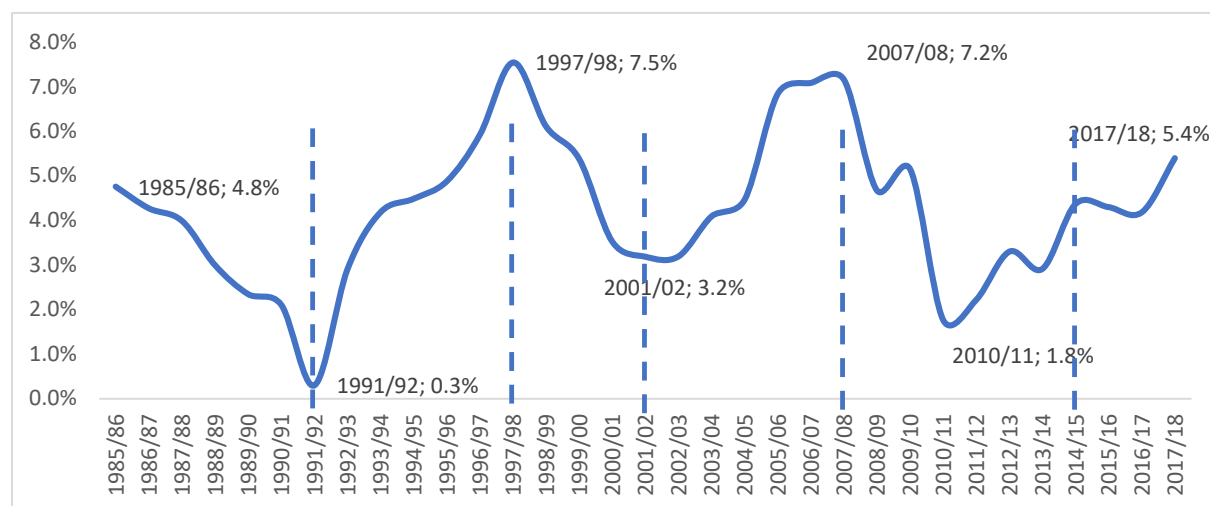
Source: WB Database, CAPMAS

The impact of these internal and external shocks, coupled with lack of flexibility in terms of dealing with these shocks from the GoE part, led to the emergence of the macroeconomic imbalances again until the appointment of a reform-oriented government in July 2004.

The macroeconomic imbalances, coupled with a slowdown in Egypt's real economic growth, led to a decline in the stock exchange's activity to unprecedented levels, the emergence of a significant mass of non-performing loans especially towards SOEs, a significantly undercapitalized banking sector, the resurgence of exchange rate parallel market rates that were meaningfully higher than official rates.

The situation led the GoE to develop a homegrown reform plan on several fronts to restore macroeconomic balances via increasing government revenues that was achieved by reducing the effective tax rates on personal and corporate incomes from 42% and 32%, respectively, to a flat rate of 20%. This tax rate cuts reduced the incentive by businesses for tax evasion and hence improved government tax revenues accompanied by the pickup in economic growth during that period. Furthermore, to restore some of the imbalances in the balance of payments, the Central Bank of Egypt (CBE) conducted a significant devaluation of the EGP versus the USD from a rate of 3.14 in 1991 to 6.2 in July 2004.

Chart 1.2: Official Exchange Rate EGP/USD
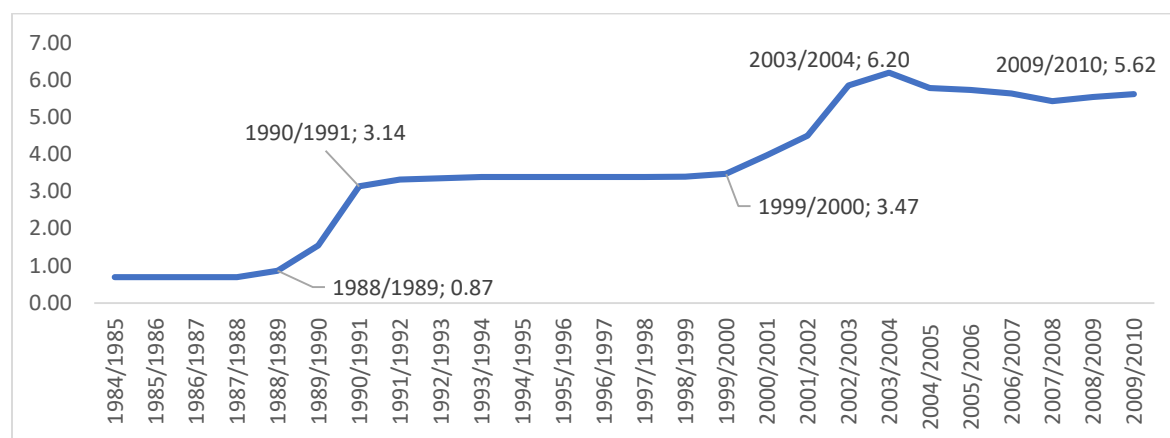
Source: WB (1984/85 - 1996/97), CBE (1999/00 - 2001/02), MoF (2002/2003 – onwards)

The reform measures targeting macroeconomic imbalances were not the only pillars of reform program, there were other reforms governing the financial sector on both the banking and non-bank financial services fronts. The aim of these reforms was largely to restore stability and soundness of the financial sector from the one hand, and improve financial intermediation and provide the required finance for the targeted growth at that point of time from the other hand. Phase I (2004 – 2008) of the FSRP is considered the effective date for financial liberalization and it had positive effects on the performance of the financial sector institutions operating in Egypt. Furthermore, and since the reforms implemented during ERSAP pertinent to capital markets was merely reinvigorating the stock market, there was no stock market specific reform whereby their impact could have been measured separately and, accordingly, the FSRP provides the building block of the assessing the time-varying efficiency of the stock market at large and the individual stocks impacted by these reforms.

In Chapters Two and Four, the main specific reforms implemented during the two phases of the FSRP (2004-2008) and (2009-2012) for the various subsectors of the financial sector will be presented.

1.3 Research Aim and Contribution

The thesis aims at assessing the impact of the overall FSRPs on the time-varying efficiency of the Egyptian stock market at large, and some stock market specific reforms on the market level and on the individual stocks levels. It also aims to rank the impact of the reforms and provide policy guidance for future reform programs designs to achieve the market efficiency target . The motivation stems from the believe that efficient capital markets do indeed have a significant role in the development of any financial sector, and that this efficiency can be improved-and does not evolve organically- by the different reform programs adopted and implemented by countries to further enhance the financial soundness and resilience of the financial sector institutions, and improve the financial and investment intermediation to the society at large as it was the case in Egypt with the announcement of the FSRP in 2004.

The above-mentioned aim is to be achieved by quantitatively and empirically assess the impact of the two phases of the financial sector reform programs on the evolving (time-varying) efficiency of Egypt's stock market via testing the evolving efficiency of EGX's main index that represents the Egyptian market proxy (EGX30). The period of study for the time varying efficiency would commence with the full data set of the index starting

from 1998 to May 2019. As for the reforms date, it will commence from July 2004 with each reform variable proxy having a different set.

Furthermore, the impact of selected stock market specific reforms on the time-varying efficiency of returns of specific companies' stocks listed on The EGX is going to be assessed. The start date will vary according to each stock listing and trading dates. The thesis attempts to contribute to the set of literature covering the Egyptian stock market in five key areas as follows:

First: no research has been conducted assessing specific financial sector reforms impact on market efficiency either at one point of time, or on a time-varying basis for the market at large proxied by one of the market's main indices or on individual stocks subject to these reforms. This thesis endeavours to identify and assess the impact of the FSRP implemented in Egypt on the time-varying efficiency of the stock market at large. FSRP impact estimation on the time-varying efficiency is one important avenue to contribute to the literature in this area in Egypt. No research - as far as the researcher is aware - have been conducted on the FSRP impact on stock market time-varying efficiency for Egypt.

Second: another contribution would be extending the estimation of the time-varying efficiency estimate for the market level beyond 2009 and assessing the drivers of efficiency improvement or worsening. This is of critical importance as Egypt witnessed significant turbulences due the financial crisis towards the end of 2008 and the two revolutions in January 2011 and June 2013, that might have reduced the potential positive

impact of the financial sector reform program measures on the time-varying efficiency of the stock market.

Third: identifying the implemented stock market specific reforms that could be quantified and turned out impactful on the time-varying efficiency on the market level and constructing the proxy variable reflecting these reforms is another important contribution. The unique set of data obtained from The EGX provides an opportune chance to assess the impact of specific reforms on the market level. Furthermore, it paves the way for other studies to be conducted not only on the impact of the specific reform and its proxy variable on efficiency, but could be used also for other aspects such as the reform impact assessment on volatility and other issues pertinent to the stock market.

Fourth: developing proxy variables for reforms and assessing this on *individual stocks* is another important contribution to the literature covering this area. It is more palatable for researchers to assess efficiency on the index level (market proxy) rather than individual stocks due to the lack of data and the volatility levels witnessed in individual stock returns. Assessing the impact of reforms on the efficiency of individual stocks opens the door for further research to be conducted in this area.

Fifth: an important contribution of this thesis is the ranking the impact of reforms and their proxy variables that most explain the improvement in the estimated time varying efficiency parameter, if any. This ranking would guide the formulation of stock market reform programs by policy makers, stock market regulators and securities exchanges. The future

guidance to the area of reforms and the specific reforms that would contribute to an improvement of the stock market efficiency could serve not only for the Egyptian market, but also for other emerging and frontier exchanges due to the similarity in some of the conditions and characteristics amongst those markets. Each market is bound to have its own particularities; however, most emerging markets share characteristics that yields most of stock market reforms as generic enough that could be partially generalized across the emerging markets.

The diversity, depth and outreach of Phase I and Phase II of the FSRP would qualify the commencement of programs in July 2004 as the financial sector liberalization date and this date will be used to assess the time varying efficiency of the stock market at large as proxied by the main index issued by The EGX (EGX30) as perceived by the market.

1.4 Research Objectives

Against the above background, the thesis objectives can be stated as follows:

1) Estimating the Egyptian stock market efficiency on a time-varying basis between the years 1998-2019. Doing so will extend the time-varying efficiency estimation literature to a period that has not been tested before that stopped at the year 2009.

2) Assessing some of the FSRPs measures impact (positive, negative, or inconclusive) on the stock market time-varying efficiency parameter on the market level measured by the index. This quantification has not been done before.

3) Ranking the impact of some of the stock market specific reforms - measured using proxy variables - on the time-varying efficiency parameter on the *market level* measured by the index.

4) Assessing the impact of some of the stock market specific reforms - measured using proxy variables constructed for the first time in academic literature covering the Egyptian stock market - on the time-varying efficiency parameter for *individual stocks* and whether it was positive or negative.

5) Ranking the impact of the FSRP and the other reform proxy variables based on the outcomes of the statistical analysis on the market and individual stocks level and derive reforms guidance to prioritize future stock market reforms in Egypt and other emerging markets to achieve the efficiency target of any policy maker, market regulator, and exchanges.

1.5 Research Design

The key objective of this thesis is to be able to contribute to the policy formulations pertinent to the stock market reform agenda and the debates governing the relative importance and priority of the different reforms between the various stakeholders. This is particularly true in the aftermath of the international financial crisis and two revolutions that had a detrimental impact on Egypt's business environment in general, and the stock market in specific and the need towards having a clear reform agenda that would contribute not only to the growth of the market, but more importantly to its efficiency.

The review of the selected literature on stock market efficiencies with the elaboration of the different forms of stock market efficiency is presented. The review will present the

evolution of literature in assessing the efficiency of stock markets to the time-varying efficiency tests that captures the evolving efficiency rather than estimating static parameters that does not take into consideration the variation of the efficiency across the time span being tested. Furthermore, the review will cover the various research published on Egypt's stock market efficiency. Selected literature on the linkages between the economic growth, market microstructure issues, and the stock market efficiency is going to be presented also to complete the frame of the importance and determinants of the capital markets efficiency.

A comprehensive description of reforms is going to be presented as it is important to understand the depth and breadth of the FSRPs implemented in Egypt on the banking, non-banking sectors and with a particular focus on the stock market specific measures. The importance stems from the fact that stock market reforms per se would not have the complete targeted impact on the market activity, growth and efficiency unless it was coupled with a robust macroeconomic policy setting that targets macroeconomic stability, sound and stable banking and insurance sectors, and an active non-bank lending sector.

Primary sources are going to be used to collect variables data that are to be considered reform proxy variables. After deciding on the reform proxy variables, the segregation of the trading data to construct the proxy variables for the reform measures. The data is obtained from the EGX data centre that aggregates all trading data and indicators for the stock exchange.

Estimating the time-varying efficiency parameters is of a statistical and numerical nature, accordingly, econometric and statistical techniques are going to be adopted to estimate the time-varying efficiency parameter as a first step, and then use techniques to estimate the impact of the proxy variables on the estimated time-varying parameter for the index and individual stocks. The proxy variables will be proxies that could represent the exact reform or could be variables that would be reflecting a certain indicator that is impacted by the reform measures. Ranking these proxy variables in terms of impact on efficiency – if present – could be used to as a guidance for developing the reform plans for the market.

1.6 Introduction to Research Methodology and Sources of Data

The research philosophy adopted in this thesis is positivism that will depend on applied research techniques to assess the impact and magnitude of the financial sector reforms at large, and capital market specific reforms on the efficiency of Egypt's stock market. More details on the research methodology are going to be presented in Chapter Three of this thesis. The quantitative research methods adopted covers how to measure econometrically using state space models the time-varying parameter (beta) of the data generation function of individual stocks and the market to assess the impact of reforms on individual stocks and the market at large. The sources of data would be the market trading data available from The Egyptian Exchange (EGX). The following methodology is adopted to reach conclusions pertinent to the reform measures as follows:

1) Reforms presentation and identification: the FSRP should have affected the capital markets at large given that it affected - as will be presented later - all aspects of the financial sector, either the banking or the non-banking financial sector including the capital markets. Specific capital market reforms are going to be presented and categorized based on the possibility to measure their impact on the market level or the individual stock level.

2) Proxy variables: after categorizing the reforms, we will identify and construct the proxy variables to be used in the econometric model to assess the time-varying efficiency parameters on the index level and on individual stocks level.

3) Model design and implementation: once data is assimilated and organized towards its respective impact on the market and/or individual stock level, the econometric model of choice is going to be run to estimate the time-varying parameters of the data generation function of index or individual stock returns using Kalman filters technique. This is to be followed with the model of determining the impact of the reforms on this time varying parameters.

1.7 Thesis Structure

Subsequent to the introductory chapter, Chapter Two presents the literature review on stock market efficiency measurement with the definitions of the different stock market efficiency forms and the efficient market hypothesis (EMH). Furthermore, the review will cover the timeline of evolvement of the literature and the associated techniques covering the different forms of efficiency testing. The adaptive market hypothesis (AMH) development will be presented also. Linkages between the financial sector development

and the stock market efficiency to the long run. Furthermore, a description of studies covering the efficiency of Egypt's stock market is presented in the literature review. economic growth rates will be presented. Additionally, Chapter Two will cover the Financial Sector Reform Programs (FSRPs) covering the banking, insurance and mortgage finance sectors implemented in Egypt during the years 2004-2008 and to a lesser extent 2009-2012 given the eruption of the international financial crisis and January 2011 and June 2013 revolutions that had a negative impact on the implementation of Phase II of the FSRP.

The FSRPs covered various subsectors in the financial sector at large. In each subsector, a sector overview and the main legislative, regulatory and structural reforms pertinent to the sector is being presented. Moreover, the main indicators representing the subsectors are going to be presented to assess whether the subsector improved after the implementation of Phase I (2004-2008) and Phase II (2009-2012) of the FSRP. Both chapters will cover the status of each subsector pre-and post the FSRP to some extent. The importance of presenting these reforms is the magnitude and size of reforms from the one hand, and that these reforms should have an impact on the general stock market time-varying efficiency and the date of financial liberalization will be proxied by a dummy variable commencing in 2004 to assess the individual impact of each reform on the time-varying efficiency parameter.

Chapter Three will cover the research methodology adopted in this thesis covering the different research philosophical underpinnings and research approaches. Moreover,

following the research questions, the research hypothesis are going to be formulated in light of the research methodology and the research's choice of research philosophy, and approach are going to be presented. Furthermore, the reasons behind the choice of Kalman Filters as the chosen technique will be presented. Stock market specific reforms will be presented in detail in Chapter Four in addition to the expected impact of these reforms on the stock market efficiency.

Chapter Five will cover the data collection and variables construction. The variables could represent the specific reform measure implemented only or represent a categorical variable that could yield significant insights and guidance on potential future reforms that could affect this categorical variable.

Chapters Six and Seven would present the results of the econometric and statistical models to estimate the time varying efficiency parameter on the market and individual stocks level, respectively. The models pertinent to the reform proxy variables and their associated relationship with the estimated time varying efficiency parameter are presented also.

Chapter Eight would be adopting statistical techniques to allow for the comparability of the proxy variables coefficients and ranking them in terms of size and frequency of witnessing this reform proxy variable as the most impactful on the estimated time varying parameter. It will present as well a summary of results and thesis conclusions and findings. Future guidance development for future reform plans setting for the Egyptian

market and other emerging markets, limitations of the research and future research areas

are presented in this chapter also.

2. Literature Review and Egypt's Financial Sector Reforms

In this chapter, we will present the stock market efficiency literature review and the financial sector reforms covering the banking, insurance and mortgage finance sectors that took place in Egypt including the regulatory landscape changes that took place during the two phases of the FSRPs.

2.1 Literature Review

2.1.1 Introduction to the Efficient Market Hypothesis

Stock Markets Efficiency refers to Informational efficiency which is assessed based on the rapid adjustment of prices to new information which if materialized quickly enough, should result in no return predictability based on historical information and Operational efficiency which is assessed based on the extent to which orders get lost or improperly executed. The aim of this thesis is to build on the area of informational efficiency pertinent to the Egyptian stock market. Informational efficiency emphasizes the role of information in setting prices of traded securities. The efficient market hypothesis (EMH) defines an efficient market as one in which new information is quickly and correctly reflected on its current security prices. In other words, informational efficiency implies that investors cannot earn abnormal returns on average from trading on any security and that there is no persistent return predictability in security prices. The EMH does not negate the fact that there are anomalies and behavioural biases that might arise in stock market trading.

However, these biases should be short lived and are dissipated very quickly should the market be an efficient one.

The term market efficiency in the context of informational efficiency was formalized by Fama (1970). In Fama (1970) review, he surveyed the empirical evidence for the different forms or strength levels of the Efficient Market Hypothesis. He concluded that the EMH could take three main forms of efficiency as follows:

Weak form efficiency: Prices fully reflect historical information including the securities' past prices and returns. This form of efficiency assumes that investors should not earn abnormal returns from pattern repetition or return predictability. In other words, stock market returns should not be correlated with historical returns at any time lag as stock prices should have reflected all historical information.

Semi-strong form efficiency: Prices fully reflect historical information and all public information. This form of efficiency stipulates that investors should not earn abnormal returns from corporate events such as dividends announcements, mergers, acquisitions, and stock splits as the implications of these events should already be incorporated in the prices.

Strong form efficiency: Prices fully reflect historical and all public and private information. This form of efficiency includes both the weak and semi-strong forms of efficiency.

Additionally, it assumes investors should not be able to earn abnormal returns based on insider information as this information should already be incorporated in security prices.

There is a significant number of literature on the efficiency of capital markets. The main findings in the selected literature that will be presented cover three main periods. The first period would be before 1970, the second period will be from 1970 to late 1980s, and the third phase from early 1990s and onwards. Furthermore, studies published in the late 1990s and early 2000s will be presented separately under the time-varying efficiency test literature and the Adaptive Market Hypothesis (AMH). Studies covering the efficiency of stock markets from a calendar anomalies perspective and literature on Egypt's stock market efficiency will be presented separately. Selected literature on the relation between the financial sector development and the long term economic growth in addition to studies pertinent to market microstructure conditions such as liquidity and its relation to the stock market efficiency is part of the literature covered.

2.1.2 Selected literature on the Efficient Market Hypothesis (EMH)

2.1.2.1 Studies prior to 1970

Even though it was Fama (1970) that formally defined the EMH, several endeavors have been exerted prior to his work to assess the efficiency of the stock markets. Fama (1965) reviewed the empirical studies conducted in the early 1960s. The methodologies adopted in these studies could be categorized into two main categories: 1) studies implementing analysis of serial correlation of returns and analysis of runs of stock returns, 2) studies testing mechanical trading rules. As per Fama (1965), they found no statistical evidence

to support the rejection of the EMH in the first and second categories of studies. This is especially true for individual traders and investors; the filter technique of trading activity still supports the EMH. However, this is not true for institutional investors.

In Fama (1970), he reviewed the empirical studies covering the three main forms of efficiency with their relevant tests. He concluded that studies during that period provide no strong supporting evidence against the weak-form and semi-strong form. However, he found some studies reporting limited evidence against the strong form efficient market hypothesis presented in studies conducted by Niederhoffer and Osborne (1966) and Scholes (1969). The former study found that specialists on the New York Stock Exchange benefit from their monopoly on the order book and that unexecuted bid and ask limit orders do provide an indication to security future price movements. The later found that corporate insiders sometimes have monopolistic information that is not revealed to the public and hence could earn higher returns than the average. This is especially true given that insiders need to report their transaction in their own company's stock to the Securities and Exchanges Commission (SEC) within six days after a sale, and not prior to the sale or immediately after.

There are various possible explanations that have been documented in several studies behind the support of the EMH during that period. Kuhn (1970) attributed this phenomenon to the so called "protective belt". It is only when sufficient evidence on anomalies appear, that a prevailing academic paradigm be replaced with a new one and during that period most of the studies not supporting the EMH does not make it to

academic publishing. Additionally, Taylor (1982) concluded that the statistical tools in the early studies were not robust enough.

2.1.2.2 Studies post 1970 and pre 1991

Fama (1991) concluded that it might be impossible to test for the efficiency of capital markets on its own. Efficiency of the stock market is not testable per se. It must be jointly tested with an asset price equilibrium model. Hence, it cannot be decided from the studies whether the asset pricing model is wrongly (badly) represented/structured or that stock markets are inefficient. He expanded the studies covered in the weak form market efficiency tests to cover not only serial correlation of returns, but also studies covering the predictability of returns using some variables like dividend yields and interest rates. Additionally, he renamed the semi-strong and strong form efficient studies to "event studies" and "tests for private information" respectively.

For the weak form market efficiency tests he concluded that the new studies show that there is predictability of returns using past returns or some other variables like dividend yield and the term structure of interest rates. Event studies support the EMH, however, studies testing for private information show that insiders have private information that are not fully incorporated in prices.

2.1.2.3 Studies during the 1990s

From 1990s and onwards and due to the mixed results and numerous studies' findings inconsistent with the EMH, a group of researchers started arguing that the EMH should

be replaced by a behavioral finance approach. As behavioral finance is not the core of this study, we will briefly present their views on why the EMH is not working.

Schleifer (2000) noted that the efficiency of the capital markets is based on three basic assumptions. The first assumption is that investors are rational. The second assumption is that, should investors be irrational, their behavior and associated trading are random and therefore cancel out in the aggregate without having a significant influence on market prices. The third assumption is the presence of rational arbitrageurs that aim at exploiting any mispricing of securities caused by irrational investors should their behavior be systematic. Schleifer notes that these assumptions may be weaker than believed. He argues that investors are irrational and their decisions are systematically affected by how information and problems are framed. This implies that their decisions are not random. Last but not least, he presents several studies that show that effective arbitrage is rare in real life examples.

During the same period, proponents of the EMH issued studies reinforcing the EMH. Fama argued in his work on market and long term memory (Fama 1998) that the evidence against the EMH rising from long-term studies are weak, as a reasonable change to the approach used in measuring abnormal returns, alters the outcomes. This implies that the problem comes from the methodology adopted in these studies.

2.1.3 Selected literature on the Adaptive Markets Hypothesis (AMH) and Time-Varying Efficiency

As shown previously, studies covering the efficiency of stock markets shows mixed results depending on the period and methodology adopted to test the EMH. This led to the development of a new paradigm - the Adaptive Market Hypothesis (AMH) – that is based on a biological and evolutionary perspective. The AMH paradigm was formally developed by Lo (2004).

In this new hypothesis, markets are not efficient at all times as individuals learn and adapt. Hence, market anomalies and inefficiencies might exist at certain times in different markets due to changes in the market microstructure, limits to arbitrage, institutional changes in the stock market as well as the entry and exit of various market participants.

On the macro level, price limits, regulatory developments and changes in informational technologies might affect the degree of efficiency at different time periods. However, as investors get to know the presence of the anomalies, they exploit them in their advantage and this leads the disappearance of such an anomaly until one or more of the abovementioned changes occurs in the market and the cycle repeats itself as follows: 1) anomaly appears, 2) investors learn about the anomaly and adapt to it, 3) anomaly disappears as rational investors get to exploit this anomaly.

The AMH took years to be formulated. This is true should financial markets be viewed from a biological perspective as pointed out by Farmer and Lo (1999). Additionally, Daniel and Titman (1999) introduced the term "adaptive efficiency" whereby behavioral biases might exist for some time. However, with the existence of investors who can identify and

attempt to profit from these biases by examining past security prices and trends, the anomaly should dissipate quickly.

As per the AMH, the time varying efficiency of stock markets should be the appropriate indicator of the efficiency of stock markets. The time varying efficiency should reflect the variation in efficiency in relation to market conditions, market microstructure, and macro conditions. The time-varying autoregressive model as a test for evolving or time varying efficiency was developed by Zalewska-Mitura and Hall (1999). However, Emerson at al. (1997) represents one of the early studies – if not the first study – to tackle the issue of stock market efficiency from a time varying perspective. Their estimated autoregressive coefficients are allowed to vary over time to reflect the changing degree of efficiency in some Bulgarian shares.

It is worthy of mention that the time-varying efficiency is more representative and applicable for emerging economies and newly operating markets. It would be unrealistic to assume that new markets are efficient right after their inauguration. However, it is realistic to assume that these markets should be more efficient over time as they mature or when specific capital market reforms are being implemented by policy makers, and hence comes the importance of testing the time-varying efficiency of stock markets. Rockinger and Urga (2000) argue that this technique could be the suitable method to assess the efficiency of emerging economies' stock markets as it is impossible to quantify the level of improvement in informational efficiency. They assessed the market efficiency of relatively recently established markets between the years 1994 and 1999. They tested

the efficiency based on a time varying parameter for the Hungarian, Czeck, Polish and Russian markets. They found that the Hungarian market is weak form efficient, the Czeck and Polish markets witnessed a convergence towards efficiency, while the Russian stock market witnessed significant persistence of predictability of returns.

Furthermore, one additional advantage in adopting time-varying efficiency tests as opposed to non-overlapping subsamples efficiency tests is that in the former the researcher does not select the micro and macro events a priori, instead the data reveals the times of higher and lower levels of efficiency and then the researcher moves to identifying the events associated with the periods revealed by the data.

2.1.4 Selected Literature on Calendar Anomalies

Calendar, also known as seasonal, anomalies could be one of the main challenges to the EMH. Anomalies are trading irregularities that contradict with the hypothesis that stock prices move randomly and accordingly investors cannot earn abnormal returns on average. Should markets be efficient, anomalies such as the January and Monday effects should not be present, and if present should not be persistent for long periods of time. In this section we will cover the studies covering the calendar anomalies present in stock markets which will be dichotomized to studies covering the January effect and studies covering the Monday effect.

The January effect anomaly is a seasonality whereby it is found by researchers that the January returns are significantly positive and higher than the other monthly returns achieved in developed and developing markets. The Monday effect is a stock market

seasonality whereby Monday returns are found to be persistently and significantly negative and lower than other weekday returns.

2.1.4.1 Month-of-the-Year (January Effect) Literature

Although some studies made the reference of the January effect as one of the seasonal anomalies present in stock return. However, it was not until the mid 1970s that this anomaly was thoroughly tested. Rozeff and Kinney (1976) tested for the presence of the January effect using the New York Stock Exchange (NYSE) equally weighted index during the period 1904-1974. The average returns for the months of January was 3.48% while the average returns for the remaining eleven months witnessed during that period was found to be around 0.42%. The equally weighted NYSE index gives small capitalization companies a relative importance as opposed to capitalization weighted index. This could provide an explanation to the existence of the January effect in the U.S market. The point that the January effect is a small-capitalization phenomenon was further confirmed in subsequent research conducted by Reinganum (1983) and Roll (1983).

Ritter (1988) conducted a study to test for the presence to the January effect and provided possible explanations to this anomaly. He noted that this anomaly could be present because of tax avoidance. He further noted that in order for individuals to realize losses for tax purposes, individuals sell stocks that declined in price during December. They hold the proceeds of the sale until January when they reinvest in a broad spectrum of small stocks. Additionally, this January purchase may be exacerbated by investments resulting

from year-end bonuses and from the sales of larger firms on which long-term capital gains are being realized. Hence, it could be concluded from the study that the January effect is caused by the trading of individual investors on small-cap stocks driven by tax avoidance targets.

Lakonishok and Smidt (1988) and Schwert (1990) found the January effect absent in large-cap returns. This supports that the January effect is largely a small-cap phenomenon. Lakonishok and Smidt attributed the small-cap January effect to the low trading volumes and the wide bid-ask spreads make profitable trading base on this anomaly difficult. Without profitable trading, this anomaly would be statistically persistent, rather than being a real economic phenomenon and does imply market inefficiency.

D'Mello, Ferris, and Hwang (2003) found that stocks with large decline in prices implying capital losses before end of year witness high selling pressures and that individual investors postpone the sale of stocks that increase in prices implying capital gains until after the New Year. These findings suggest that individual investors are the major sellers around the end of the year and that individual tax-loss selling is the main explanation of the anomaly witnessed in January.

Bharba, Dhillon, and Ramirez (1999) noted that since the ratification of the Tax Reform Act of 1986 in the USA, a new anomaly appeared in addition to the January effect, the November effect. The Tax Reform Act requires mutual funds to distribute at least 98 percent of realized capital gains and dividend income generated in the twelve month prior

to 31 October. Any undistributed earnings is subject to a 4% excise tax. Accordingly, mutual funds have an incentive to sell losing stocks before October 31 to reduce the taxable capital gain they are required to pass on to shareholders. However, the Tax Reform Act eliminated the 60% deduction for long-term capital gains, effectively resulting in an increase in the capital gains tax rate. Thus, there is a greater incentive for investors to realize losses in the post Tax Reform Act period. They argued that we should observe an increase in January excess stock returns and trading volume in the post-Act period should the tax-loss selling be the dominant explanation for the seasonality of stock returns.

Haug and Hirschey (2006) analyzed broad samples of value-weighted and equal-weighted returns of U.S. equities. They documented that the abnormally high rates of returns on small-cap stocks continue to be present and persistent in the month of January, and not affected by the passage of the Tax Reform Act of 1986. Since the passage of the Act, any seasonal anomalies related to institutional investors should not occur at calendar year-end. Hence, they argued, tax-motivated selling by individual investors and window dressing for small-cap institutional investors who retained a January-December reporting period despite the new November-October tax period, contribute to the presence of the January effect.

2.1.4.2 Day-of-the-Week (Monday Effect) Literature

Abundant literature documents the anomaly that weekday returns vary with the day-of-the-week. A persistent anomaly is the Monday effect as documented in the literature. The

Monday effect is the presence of consistent negative returns on Mondays in the U.S. markets and other international developed and emerging markets. Maberly (1995) states that it was market practitioners that early documented the Monday effect. He mentioned that Kelly (1930) was first to document the Monday effect and even related this anomaly to human psychology.

From that date until early 1980s, several practitioners documented the Monday effect by adopting non-rigorous statistical tests such as: comparing average increases and decreases on Mondays and percentage of days of positive returns as opposed to negative returns (Fields (1931), Merrill (1966), Cross (1973)).

Pettengill (2003) documents that French (1980) conducted the first rigorous statistical testing technique on the significance of the Monday effect. He tested for the anomaly using the S&P 500 Index during the period 1953-1977 and found that the expected stock market returns from Friday to Monday was probably negative over the period. He attributed his findings to the possibility that information released over the weekend tends to be unfavorable. Gibbons and Hess (1981) tested for the presence of the Monday effect using the S&P 500 Index and the value and equally-weighted portfolios and found the presence of a Monday effect in the data at hand. Keim and Stambaugh (1984) and Linn and Lockwood (1988) extended the analysis to include not only the S&P 500 Index but also OTC traded securities and documented the presence of Monday effect in both listed and OTC stocks. Lakonishok and Smidt (1988) used 90 years of daily data on the Dow Jones Industrial Average Index to test for the existence of persistent seasonal patterns in

the rates of return. They found evidence of persistent anomalies around the turn of the week, around the turn of the month, around the turn of the year, and around holidays.

Connolly (1989), confirmed by Chang, Pinegar, and Ravichandran (1993) findings, found a statistical difference between Mondays returns and other weekday returns during the years 1963-1974. However, post 1974 and until 1983, the Monday effect seemed to be insignificant especially when transactions costs are taken into account.

Kamara (1997) tested the Monday seasonality using the S&P 500 Index for the years 1962-1993 and found that the seasonality declined for large-firm securities after 1975 after the abolishment of fixed brokerage commissions. They found that this decline is positively related to the ratio of institutional to individual trading. On the other hand, they found that the seasonality is persistent for small stocks irrespective of the ratio of institutional to individual trading. They attributed this seasonality to the persistent higher trading costs for small stocks which did not decline post 1975.

Mehdian and Perry (2001) tested for the Monday effect using three large-cap indices (S&P500, NYSE, and DJCOMP) and two small-cap indices (Nasdaq and Russell) for the period 1964-1998. They tested for the Monday effect in response to institutional versus individual trading. Additionally, they tested:1) the stability of the Monday effect using Chow breakpoint tests and recursive coefficient estimations, 2) whether the Monday effect is being driven by stock price trends present in the previous week or not. For the full-sample period and the subsample period running from 1964-1987 they concluded that

Monday returns are significantly negative and lower than the weekday returns and that Monday returns are positively correlated with the previous week returns. For the post 1987 data period, Monday returns proved to be significantly positive (with insignificant difference from weekday returns) for the three large-cap indices and insignificantly negative (with significant difference from weekday returns) for the small-cap indices. Additionally, they found that Monday returns are uncorrelated with previous week returns for all indices except for Nasdaq and Russell indices. It is worthy of mention that Mehdian and Perry attributed the relationship between the company size and the Monday effect to the institutional versus individuals trading volumes and the transaction cost advantage for trading large-cap stocks as opposed small-cap stocks. This implies that institutional traders were in a better position to exploit this anomaly in their favor and hence its diminishment over time.

Some scholars attributed the Monday effect anomaly to data mining as pointed out by Sullivan, Timmermann, and White (2001). They adopted a bootstrap procedure to identify calendar anomalies and found no evidence of their presence. Another possible explanation is related to the assumption of normality of returns. Connolly (1989) and Najand and Yung (1994) found that average returns are equal across weekdays. They adopted Generalized Autoregressive Conditional Heteroscedasticty (GARCH) models to account for heteroscedasticty. Furthermore, Chien, Lee, and Wang (2002) found that adjusting for heteroscedasticty reduces the Monday effect significantly.

For other developed markets, Hindmarch, Jentsch, and Drew (1984) found statistically significant negative average returns for Mondays in the Canadian, British, Japanese and Australian equity markets. Condoyanni, O'Hanlon, and Ward (1987) tested for the presence of negative Monday returns for seven developed markets. Namely, the USA, Australia, Canada, England, France, Japan, and Singapore. They found significant negative Monday or Tuesday returns for all markets. Other studies such as Chang, Pinegar, and Ravichandran (1993), Dubious and Louvet (1996) and Tong (2000), found significant negative Monday returns. Mills and Coutts (1995) tested for the various calendar anomalies present in the London stock exchange. They used the FTSE100, FTSEMid250, and FTSE350 indices for the period running from January 1986 to October 1993. They found that the Monday returns are significantly negative when it is not an account day[1] announced by the London Stock Exchange. However, should Mondays be an account day, Monday returns become significantly positive. They concluded that the Monday effect is predominantly a settlement effect.

It is worthy of mention that the day-of-the-week effect was found to be present in several emerging markets. Aggarawal and Rivoli (1989) found negative Monday and Tuesday returns in four Asian markets. Coutts, Kaplanidis and Roberts (2000) tested the presence of calendar anomalies in the Athens stock market for the years 1986-1996. Despite the presence of a Monday effect they found it is not persistent over time. Tonchev and Kim (2004) tested for the presence of calendar anomalies in the Czech Republic, Slovakia,

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[1] A Monday Account Day gives the buyers of shares eleven to eighteen days until payment. This represents free credit.

and Slovenia for the years 1999-2003. They found no presence of Monday effect in the three countries.

We will move in the next section to the literature written on efficiency and stock market in respect to market microstructures such as trading volume and price limits and its impact on efficiency.

2.1.5 Selected Literature on Market Microstructure and Efficiency

2.1.5.1 Trading Liquidity and Market Efficiency

In addition to the previous selected presentation of studies covering the efficiency of stocks markets from various angles, there have been research relating short term return predictability (intra-day time intervals) and speed of price correction of prices labelling it as market efficiency with liquidity of trading identified by market microstructure parameters such as order flows. The field of this category of research is concerned with how prices are formed and analysis is being conducted on a market microstructure basis. Chorida et al. (2008) conducted their analysis and research by linking trading liquidity and market efficiency. They conducted their research on a sample from the largest 500 companies listed on New York Stock Exchange (NYSE), and after accounting for size and liquidity to focus on relatively liquid and sizable stocks, their sample size declined to 193. They analyzed order flows on a short interval and conducted regression analysis to determine if order flows had any improving effects on market efficiency. According to their findings, the higher the liquidity on a particular stock, the more arbitrageurs will participate on the trading of those stocks, which reduces return predictability and hence resulting in

an improvement in market efficiency. This has been tested in the study via the use of variance ratio tests that proposes that stock prices were closer to follow a random walk in the more liquid stocks. They stipulated that "short-horizon return predictability from order flows is an inverse indicator of market efficiency", and that this predictability declines with small bid-ask spreads, and also that this predictability weakened if not eliminated as time elapsed with the introduction of the minimum tick size in the market. Chorida et al. (2008) research was further expanded by Chung and Harzdil (2010) and they expanded the sample size to cover all listed stocks on the NYSE analyzing the order flow and its impact on market efficiency for 4222 firms listed on the NYSE. Their findings was similar to Chorida et al. (2008) that the increased liquidity reduces the return predictability on short intervals during the trading day. An additional explanation posted by both analysis was that larger orders per se increases the collection of new information and gets incorporated in the prices more effectively.

Other researchers aimed at proving that lower predicted returns following unusual higher share turnover on the firm level is associated with irrational behavior by investors that dampens information received and contained in the orders such as Baker and Stein (2002). Their argument is that this is especially true in the absence of short selling trading mechanism, whereby higher liquidity and trading activity is a sentiment indicator. Short selling is the trading mechanism that enables investors to sell stocks they do not own betting on a price decline for those stocks to create a gain resulting from the difference between the selling price and the purchase price of the stock to close the borrowed position subject that the investors' expectation materialize.

In addition to the above, Bianchi and Frezza (2018) conducted an analysis on three indices, namely; S&P 500, Nasdaq, and DAX, and estimated efficiency based on a Brownian martingale methodology (pointwise regularity of the price) and found that liquidity and efficiency are closely related and in effect efficiency measure is a better predictor of illiquidity. In other words, when the market is price inefficient, it predicts a lower liquidity.

2.1.5.2 Price Limits and Market Efficiency

Some research is being conducted to assess the impact and effectiveness of price limits and its effect on volatility, however, less is conducted on relating the price limits on the efficiency of the stocks whereby this limit is imposed. Seddighi and Yoon (2018) attempted to assess the impact of expanding price limits on stock market efficiency in the Korean market within a framework of random walk model. This is an event based assessment as the researcher conducts his analysis pre and post the expansion of the price limits from 15% to 30%. Their finding suggest that daily returns in more stocks in the Korean market appear to be weak form efficient when limits are expanded. Another study conducted on the stock price limits in Egyptian stock market by Abdelzaher and Elgiziry (2017) aimed at testing the impact of the daily price limits on the investment risk and concluded that price limits delay the price discovery mechanism as it interferes with market dynamics and accordingly it is considered to be detrimental to the market efficiency.

We will move in the next section to the literature written on Egypt in respect to market efficiency. The literature will cover studies testing for efficiency based on serial or auto correlation of returns, and studies testing for the presence of calendar anomalies.

2.1.6 Literature on the Efficiency of the Egyptian Stock market

The literature on the Efficiency of the Egyptian Stock Market is not as abundant as it is for other developed markets and is also limited in terms of scope. The limited available literature tackled the issue of efficiency using data of different time periods. The results were mixed from a study to another. We will present the empirical studies concentrating on the Egyptian Stock Market on a stand-alone basis and then move to the studies taking into consideration several African, Arab and MENA region countries including Egypt.

2.1.6.1 Correlation of Returns Studies

Mecagni and Sourial (1999) examined the efficiency of the Egyptian stock market in terms of daily returns independence. A GARCH in mean model was adopted on four different indices that vary according to the level of activity and breadth. The data used ran from September 1994 to December 1997. The hypothesis of linear independence of daily logarithmic returns was strongly rejected for the four indices with a varying degree of return predictability. Daily returns calculated from the four indices displayed a strong first-order serial correlation which could be used to achieve a degree of predictability on the basis of past returns. The results of Mecagni and Sourial imply that the performance of

the Egyptian stock market deviates from the weak form Efficient Market Hypothesis in the pricing of equities.

Some other studies tested the Egyptian Stock market among other African and Middle Eastern stock markets. Smith et al. (2002) tested the random walk hypothesis for eight African stock exchanges that vary in size, maturity and level of development. The stock markets tested are South Africa, Egypt, Kenya, Morocco, Nigeria, Zimbabwe, Botswana and Mauritius. The data used for Egypt ran from January 1993 to August 1998. The results show that apart from South Africa, the random walk hypothesis was rejected because the weekly returns are correlated implying that these markets are not weak form efficient.

Appiah-Kusi and Menyah (2003) tested weak-form market efficiency on eleven African stock markets but only five of them proved to be weak-form efficient, namely Egypt, Kenya, Mauritius, Morocco and Zimbabwe. That paper modeled weekly index returns adjusted for thin trading as a nonlinear autoregressive process with conditional heteroscedasticity (EGARCH-M model) to investigate the weak-form pricing efficiency. They rejected that the Nigerian stock market is weak-form efficient. On the other hand, they accepted that the markets in Egypt, Kenya, Mauritius, Morocco and Zimbabwe are efficient while that of South Africa, Botswana, Ghana, Ivory Coast, and Swaziland are not consistent with weak-form efficiency.

Omran and Farrar (2005) tested the weak form efficiency in Middle Eastern emerging markets by applying a range of statistical techniques on the returns' series from Egypt, Israel, Jordan, Morocco and Turkey. They rejected the null hypothesis of random walk for all markets, except for Israel. Jefferis and Smith (2005) implemented a test of evolving efficiency over the period 1990-2001. The results show that the Johannesburg Stock Exchange was weak-form efficient during the period, Egypt, Morocco and Nigeria became efficient towards the end of the testing period. Mauritius showed a slow tendency towards efficiency whereas Kenya and Zimbabwe displayed no tendency at all. Smith (2008) who, by applying four joint variance ratio tests, rejected the random walk hypothesis for eleven African stock markets investigated including Egypt.

Lagorade-Segot and Lucey (2008) investigated the informational efficiency in seven MENA countries, namely: Egypt, Morocco, Tunisia, Jordan, Lebanon, Israel and Turkey. They conducted their investigation by applying, unit root, individual variance ratio, multiple variance ratio, and non-parametric variance ratio analysis. They rejected the random walk hypothesis for all seven countries with varying degrees. Additionally, they tested for efficiency via assessing the profitability of two technical trading rules and found that they have some predictive powers and hence violating the EMH.

Abdmoulah (2010) follows the methodologies set out in Emerson et al. (1997) and Zalewska-Mitura and Hall (1999) to investigate for the evolving efficiency in eleven Arab countries. He found that, in aggregate, Arab stock markets are not weak-form efficient and that the efficiency levels do not improve sufficiently over time.

2.1.6.2 Calendar Anomalies Studies

Aly et al. (2004) tested the presence of the day-of-the-week effect in the Egyptian stock market. They investigated the existence of daily return anomalies using the major index issued at that time by the Capital Market Authority of Egypt (CMA Index). The data set used ran from April 1998 to June 2001. The test implemented is not a direct test for the efficiency of the Egyptian stock market. They found that returns on Mondays are positive and significant, but are not statistically significantly different from the rest of the week returns. The first step conducted to test for the day-of-the-week effect in the Egyptian stock market was to run an Ordinary Least Square model with dummy variables to cover the different days of the week's returns. It was found that Monday returns are significantly positive, as opposed the rest of the week daily returns which were found insignificant. To further investigate on the presence of the anomaly, they performed the difference-of-means test and found that Monday returns are not statistically significantly different from the rest of the week daily returns.

Kamaly and Tooma (2009) investigated the day-of-the-week effect in twelve Arab stock markets namely; Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Abu Dhabi, and Dubai. They accounted for the heteroscedasticity of returns by adopting GARCH-type specifications to allow for a time-varying variance. Their results show that four out of twelve exhibit a day-of-the week in returns. Eight markets exhibit a day-of-the-week on volatility. The significant variables are found to be present at the beginning or at the end of the trading week. As for the Egyptian market in specific,

returns on Sundays[2] and Thursdays proved to be statistically significantly positive. As for the effect of the day-of-the-week on the volatility of returns, it was found that Sundays, Tuesdays, and Thursdays have a significant impact on volatility.

Mlambo and Biekpe (2006) investigated calendar anomalies in nine African stock markets, namely; Botswana, Cote d'Ivoire, Egypt, Ghana, Mauritius, Morocco, Namibia, Tunisia, and Zimambwe. They found that Tuesday returns on EGX are the lowest compared to other weekday returns. Additionally, they found January returns to be significantly higher than other monthly returns. Furthermore, they found that week-of-the-month anomaly is present in the Egyptian market. In specific, they found the third week of the month daily returns significantly higher than other weeks.

The following table summarizes the literature on the efficiency of the Egyptian stock market either from an EMH or calendar anomalies perspectives as presented previously.

Table 2.1: Summary of Literature on the Egyptian Stock Market Efficiency

Mecagni and Sourial (1999)	
Study Name	The Egyptian Stock Market: Efficiency Tests and Volatility Effects
Market(s) Covered	Egypt
Period Covered	September 1994-December 1997
Technique	AR(1)-GARCH(p,q) (Deterministic)
Conclusion	Departure from the EMH. Presence of serial correlations of daily returns.
Critical Analysis	The study conforms with that newly reinvigorated or born markets tend to be inefficient. There has been an important change mentioned in the study with the introduction of daily price limits of ±5% and ±20% per week in February 1997. The data ran till December 1997 and it could have more prudent to breakdown the analysis to pre- and post the introduction of the circuit breakers to clearly identify if it had a worsening effect on efficiency or not rather than taking the entire sample altogether. The deterministic models would give and average period estimate, but this average could be significantly negatively impacted with the tight price limits of ±5%.

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[2] Trading week at EGX is Sunday to Thursday

Smith et al (2002)	
Study Name	African stock markets: multiple variance ratio tests of random walks
Market(s) Covered	South Africa, Egypt, Kenya, Morocco, Nigeria, Zimbabwe, Botswana, Mauritius
Period Covered	Weekly Observations: January 1993 – August 1998
Technique	Multiple Variance Ratio Tests (Deterministic)
Conclusion	Departure from the EMH. Homoscedastic & Heteroscedastic Random Walk Hypothesis are rejected because of positive autocorrelation of returns.
Critical Analysis	The results indicated that the EGX departed from the EMH around the year 1999. The main potential drawback is the lack of segregation of periods. Prior to February 1997, stock prices in Egypt were allowed to change without price limits while post that date, price limits were introduced as mentioned by Mecagni and Sourial (1999). Failing to separate the testing period to pre and post the tight price limits excludes a potential important explanation for the departure from the EMH. The explanations provided in the study was the superiority of Johannesburg Stock Exchange (JSE) in terms of market capitalization, liquidity and turnover, and institutional maturity of exchanges. These are only possible explanations provided in the study that were not formally tested.
Appiah-kusi and Menyah (2003)	
Study Name	Return predictability in African stock markets
Market(s) Covered	Egypt, Kenya, Zimbabwe, South Africa, Mauritius, Morocco, Botswana, Ghana, Ivory Coast, Swaziland
Period Covered	Weekly observations, period not specified, but footnote in Table (1) (p. 257) stipulated there no price limits present in Egypt, so it is assumed that the sample data used for the efficiency estimation ends before February 1997, which is the date of imposing a ±5% and a weekly price limit of ±20%.
Technique	EGARCH-M (p,q)
Conclusion	The estimated coefficient of the efficiency parameter in the mean equation for Egypt was not significantly different than zero. This implies the Egyptian market did not depart from the EMH.
Critical Analysis	The econometric model and specification used in this study is robust and took into consideration the risk premia variation and incorporated it in the return mean equation. Having said that and given that the study has been published in 2003, it should have captured the imposition of the price limits in February 1997 as it could significantly impact the findings. A contradicting finding to other studies is that the authors found that Johannesburg Stock Exchange is inefficient.
Omran and Farrar (2005)	
Study Name	Tests of weak form efficiency in the Middle East emerging markets
Market(s) Covered	Egypt, Israel, Jordan, Morocco, Turkey
Period Covered	January 1996- April 2000
Technique	Random Walk Test via regressing returns on a constant drift and assessing variance stability
Conclusion	The random walk has been rejected for Egypt implying a departure from the weak-for EMH
Critical Analysis	Returns are found to be serially correlated and the normality or independence of these return series has been rejected for Egypt, furthermore, the Egyptian market failed the variance ratio test. Thursday's returns (last trading day of week) seemed to significantly positive and different than other days. Despite that the estimation techniques are widely used, the return generation function did not incorporate the plausible return generation processes. Furthermore, the sample used is quite small and the efficiency results inference is based on deterministic models, and does not capture the time varying component of efficiency or assessing its magnitude.

Lagoarde-Segot and Lucey (2008)	
Study Name	Efficiency in emerging markets—Evidence from the MENA region
Market(s) Covered	Egypt, Morocco, Tunisia, Jordan, Lebanon, Israel, Turkey
Period Covered	January 1998 – November 2004
Technique	Developing an Efficiency Index utilizing Unit Root Analysis, Individual Variance Ratio Analysis, Multiple Variance Ratio Analysis, non-parametric variance ratio analysis, Variable Moving Average (VMA) trading rule, Trade Range Breaking (TRB) trading rule. The first four tests are conducted to assess if the random walk is rejected or not. The authors ran an ordered-logit model while incorporating factors reflecting market capitalization, turnover, disclosure, management liability, shareholder control, rule of law, and government intervention.
Conclusion	Three out of four tests, the random walk hypothesis was rejected for Egypt indicating that the Egyptian market departed from the EMH.
Critical Analysis	The first three methodologies adopted are common and used, the second two test relying on technical analysis trading rules and assuming that having these trading rules being successful is not common in the literature governing stock market efficiency. The results pertinent to the Egyptian stock Market needs to be taken with caution given that the statistical models are deterministic in nature and provides one-point estimates of efficiency and does not capture the time-varying component of efficiency.
Abdmoulah (2010)	
Study Name	Testing the evolving efficiency of Arab stock markets
Market(s) Covered	Abu Dhabi, Jordan, Bahrain, Morocco, Qatar, Dubai, Egypt, Kuwait, Oman, Saudi Arabia, Tunisia
Period Covered	2001-first quarter 2009
Technique	State space model
Conclusion on Egypt	All market including Egypt deviate from the weak form EMH apart from the Saudi Arabian Market
Critical Analysis	The researcher captured the time varying efficiency given the adoption of state-space models. The author attributed the inefficiency given the positive and significant value of the estimated efficiency parameter to the ineffectiveness of the reforms undertaken which could be detrimental the steady development of the financial systems in these economies. However, this conclusion is not formally tested, it is just inferred from the finding.
Aly et al. (2004)	
Study Name	An Analysis of Day-of-the-Week Effects in the Egyptian Stock Market
Market(s) Covered	Egypt
Period Covered	April 1998 – June 2001
Technique	Simple deterministic regression model with dummy variables reflecting daily returns.
Conclusion on Egypt	Monday returns are found to be significantly positive but not significantly different than the returns of the rest of the week. Furthermore, Monday returns are found to be significantly more volatile than returns from Tuesday to Thursday.
Critical Analysis	The model adopted is a simple econometric model but there was no data generation function [such as an AR(i)] embedded in the model. Furthermore, the model showed that the only dummy variable coefficient that has any meaningful statistical significance is the Monday one, but the authors relied on the difference of mean test and did not find a significant difference in mean returns.
Kamaly and Tooma (2009)	
Study Name	Calendar anomalies and stock market volatility in selected Arab stock exchanges

Market(s) Covered	Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Abu Dhabi, Dubai
Period Covered	May 2002 – December 2005
Technique	AR and GARCH-M with daily returns dummy variables represented in the return equation [AR(i)] and the GARCH equation to capture differences in day of the week volatility.
Conclusion on Egypt	Sunday's and Thursday's dummy variables coefficients are found to be significantly positive in addition to three other markets out of the 11 investigated in the paper. This is a deviation from the weak-form EMH. Furthermore, Sunday's, Tuesday's, and Thursday's dummy variables coefficient in the GARCH model turned out to be positive and statistically significant at varying degrees of significance.
Critical Analysis	The statistical model implemented in this paper is robust and captures the varying volatility and contains a data generation function for returns. This explains the potential differences with other studies that found no day-of -the week effect [Aly et al. (2004)] in the Egyptian market. Another point to be noted is the reliance of the researchers on a single source of indices provided by the Arab Monetary Fund (AMF) for all markets investigated. This eliminates discrepancies in indices calculation methodologies across markets. There was no attempt to explain why the presence of the day-of-the-week in the markets that was found present in it.
Mlambo and Biekpe (2006)	
Study Name	Seasonal effects: Evidence from emerging African stock markets
Market(s) Covered	Botswana, BRVM, Egypt, Ghana, Mauritius, Morocco, Namibia, Tunisia, Zimbabwe
Period Covered	January 1997 – December 2002
Technique	Simple regression model with dummy variables for the different days of the week, turn-of-the-month, end-of-year, turn-of-year, week-of-the-month.
Conclusion on Egypt	Third trading day of the week showed the lowest returns, first trading session of the year (turn of the year effect) showed significant positive persistence, and January effect present, i.e presence of calendar anomaly.
Critical Analysis	Founding the presence of an unexploited calendar anomaly is an indication of deviation of the weak form EMH. A point worthy to be taken into consideration is that there is no formulation for the data generation function for returns. Despite that the presence of anomalies are not formal tests of the EMH, but the presence of unexploited and persistent calendar anomalies is a clear indication of the deviation from the EMH.

Source: Researcher

After presenting the literature covering the Egyptian stock market, it would be of importance to present some of the studies conducted on the relation between financial liberalization and degree of development and the economic performance.

2.1.7 Selected Literature on Financial Liberalization and Economic Development

2.1.7.1 Financial Sector and Economic Development

After presenting the literature review pertinent to the different methodologies of testing the stock market efficiency, and the studies conducted on Egypt in this field, it is of importance to present some of the literature relating the financial sector development and economic growth. This is quite important, as having efficient stock market allows for the efficient allocation of capital which in turns yields to a better economic performance and development. Levine and Zervos (1996) conducted a research on a cross country basis and found a strong correlation between stock market development and the long-run economic growth. Having said that, their suggestion is that their findings should be viewed as suggestive or proposed partial correlations and not causality. Levine (2004) conducted a research reviewing, appraising and criticizing research papers on the connections between the operations of the financial systems and economic growth, and despite - as per the findings of the research - of having several countervailing views, the majority of evidence proposes that financial intermediaries and markets are an important factor for economic growth.

Dow and Gorton (1995) developed a theoretical model with the aim of linking the price informational efficiency of the stock market and economic efficiency. They argued that despite that stock prices signals to firms' managers what the market believes about the firms profitability and investment opportunities, and accordingly are considered an indirect signaling role, yet have no direct "allocative role" of resources. They stipulate in the study that efficient stock prices enhance economic efficiency via a forward-looking role and a backward-looking role. The forward-looking role is where firms' managers infer from the

stock prices the perception of informed traders regarding the future investments of the firm, and since these investments are not yet implemented, it is forward-looking role of stock market prices. The backward-looking role is related to firms' managers incentives being linked to the stock prices in the market, and hence stock prices can be used to assess previous management decisions and accordingly, incentivizes managers to accurately monitor their investment policies implemented in the past. In short, they put that stock prices "has an information-production role and a monitoring role".

2.1.7.2 Financial Sector Liberalization and Efficiency

Few studies have been implemented on financial sector liberalization and reforms and its impact on the stock market efficiency. The findings of these studies are mixed. Kawakatsu and Morey (1999) examined the impact of financial liberalization on nine emerging markets stock prices, Argentina, Brazil, Chile, Colombia, India, Korea, Mexico, Thailand and Venzuela for the years from 1976 to 1997. Their findings is that there is no significant difference in the behavior of emerging markets stock prices before or after liberalization. In effect, they found that those market exhibited weak form efficiency before market liberalization. They chose the break points to assess the market efficiency pre and post the chosen dates of the assumed financial sector liberalization. They stipulated that this does not imply that the official liberalization of the financial sector did not have a positive impact on efficiency. One of the potential explanations they have put is that markets react before the incident itself, which is the actual announcement of liberalization, and hence markets could have improved in efficiency prior to the liberalization announcement and

this could partially explain their findings that those markets were efficient prior to liberalization.

Other studies found that emerging markets became more efficient after liberalization or opening the markets to international investors. Kim and Singal (2000) conducted their study on 20 emerging markets comparing monthly returns pre and post market opening to international investors from a return comparability, return volatility, and efficiency perspectives. When it comes to efficiency, they found that there is a statistically significant decline in predictability in returns after the market opening. Henry (2000) examined 12 emerging markets average abnormal returns before the date of liberalization of those markets and after it. He used several windows in the estimation of the abnormal returns while controlling for co-movements with international markets. He used a variation of the Capital Asset Pricing Model (CAPM) to determine the abnormal returns, namely, the International Asset Pricing Model (IAPM) and found that there is significant reduction in expected returns of stocks in the periods post market liberalization due to a decline in the required rate of return or cost of equity when the market open to foreigners.

Arouri et al. (2010) tested the time-varying efficiency for Argentina, Brazil, Malaysia, Mexico, and Thailand and tested how this time-varying efficiency evolved with the financial liberalization of those markets and it impacted the evolving efficiency of those markets amongst other variables. They found that the weak form efficiency measure varies across time, and that actually three out of the five markets showed improved

efficiency because of the financial liberalization. They estimated the time-varying efficiency measure using Kalman Filters.

2.1.8 Section Conclusion

Since the seminal work by Fama (1970) on the EMH, there has been a vast array of research aiming at testing the efficiency of stock markets. These tests comprised a range of parametric and non-parametric statistical techniques to assess the efficiency of the stocks markets. These tests have been conducted on a time-series basis and on an event basis to assess the different forms of efficiency. Furthermore, some studies tackled order flows and market microstructure on market efficiency. Fewer studies tackled the issue of specific measures and its impact on the market efficiency. A common thing amongst most of these studies is that they aimed at determining the efficiency in a deterministic context to assess the efficiency at one point of time. It is argued in some studies that this is particularly difficult for emerging markets as it is unrealistic to assess efficiency based on deterministic models with single estimates of the efficiency parameter without taking into consideration how this is evolving though time. Furthermore, with some induced reforms and financial liberalization by governments, efficiency is supposedly driven by these reforms. Accordingly, the efficiency will evolve as these reforms are being implemented.

In addition to the above, how the development of the financial sector and the efficiency the capital markets relate to long term economic growth has been briefly summarized to put the literature review in its context. Achieving efficient stock markets and advancing the financial sector is not an academic quest, it has positive repercussions on the capital

formation and allocation within the economy, and in effect impacts positively the long-term growth target.

In the next section, and in relation to the literature covering the relationship between the financial sector development and economic growth and performance, we will be presenting the financial sector reforms implemented during the two phases of the FSRPs covering the regulatory landscape developments, banking, insurance and mortgage finance market reforms. The stock market reforms will be presented in Chapter 4.

2.2 Introduction to Egypt's Financial Sector Reforms

The Government of Egypt (GoE) announced and embarked on the implementation of a comprehensive reform program to reform its financial sector both on the banking and the non-banking financial services fronts. The reforms spanned from regulatory, market macro and micro-structures, and prudential regulations. In this section, the FSRPs will be presented and covered for the banking, insurance and mortgage finance sectors, with capital markets specific reforms to be presented in the following chapter due to its magnitude, depth and details pertinent to specific stock market reforms. The aim of the detailed presentation of these reforms is to not only validate why the FSRP commencement is considered the date of financial liberalization given its diversity and magnitude, but also understand what will the dummy variable representing the FSRP date reflect. Some of the specific capital market reforms that are quantifiable and hence can be proxied with some numerical data will be incorporated in the regression models and hence these specific reforms impact is segregated from the overall FSRP.

2.3 Financial Sector Reform Programs

Prior to the year 2004, the Egyptian financial sector; the banking and non-banking sectors were facing significant pressures, the financial institutions operating in Egypt were meaningfully undercapitalized and some of these institutions where on the brink of insolvency if not bankruptcy.

The banking sector, for example, which constituted at that time over 95 per cent of the financial system's assets, suffered from heavy Government intervention and lax lending procedures (The World Bank, 2006). Furthermore, the sector was characterized as being overbanked and under branched. This resulted in low levels of credit availed to the private sector especially for small and medium enterprises (SMEs), insignificant and limited financial innovation and a significant stock of non-performing loans (NPLs) especially towards State Owned Enterprises (SOEs).

On the other hand, the non-bank financial sector (NBFS) was characterized by; a scattered regulatory framework, a relatively small insurance and contractual savings sector, almost non-existent mortgage markets, limited trading and awareness of the stock market, a non-existent asset and mortgage backed securities markets (ABS and MBS), and poor financial infrastructure. The relatively small size of the non-bank financial sector and its institutions contributed to the limited availability of long-term savings and the overall limited access to finance.

Other financial firms such as stock brokerage companies, non-depository lending institutions such as financial leasing companies were present and operating in the economy, however, remained relatively underdeveloped. In specific, stock brokerage companies witnessed a significant systemic risk with several companies announcing financial distress and bankruptcy between the period 1999-2002 and were subject to fraud cases by their employees between the years 2002 to 2003. The fraud cases where a result of the economic slowdown from the peak growth rate materializing in 1998 and stock market declines that took place starting from the Asian crises until a new cabinet was formed in July 2004. And despite having a collective insurance agreement against fraud or individual bankruptcy cases between brokerage companies and the four state owned insurance companies, this systemic risk led the insurance companies to default on their compensations to stock market investors. What magnified the problem at that time was the lack of coordination between the different regulatory bodies at that time such as the Capital Market Authority (CMA), and the Egyptian Insurance Supervisory Authority (EISA).

In 2003, the Government of Egypt (GoE) at that time issued an important legislation; namely, Law Number 88/2003 governing the "Central Bank, Banking System and Money". The law was the starting point for the design and implementation of the two phases (2004-2008 and 2009-2012) of the FSRP as the ratified law introduced several reforms to the banking sector in Egypt among which; the operational independence of the Central Bank of Egypt (CBE) from the GoE, stronger macro and micro prudential regulations, significant enforcement powers to the CBE over the banking sector, and most importantly, higher

minimum capital requirements for banks operating in Egypt over a period of three years

that led to a strong wave of consolidation in the banking sector as will be mentioned in

later sections of this chapter.

Prior to 2004, regulators of the non-bank financial institutions (NBFIs) were scattered

between the different line ministries. For example, the line ministry for the Capital Market

Authority (CMA) was the Ministry of Economy and Foreign Trade (MoEFT), the Egyptian

Insurance Supervisory Authority (EISA) line ministry was the Ministry of Planning (MoP),

the Mortgage Finance Authority (MFA) line ministry was the Ministry of Housing and

Urban Development (MoHUD), and the other non-bank financial activities such as

financial leasing and factoring were regulated by the General Authority for Free Zones

and Investment (GAFI) with the line minister being the Prime Minister (PM). The following

table presents the regulatory landscape across all non-bank financial functions before

2004.

Table 2.2: Egypt's Financial Sector Regulatory Structure Prior to 2004

Line Minister (s)	PM/MoEFT	MoEFT	MoP	MoHUD	PM
Regulatory Body	CBE	CMA	EISA	MFA	GAFI
Regulated Entities	- Banks - Foreign Branches of Banks - Foreign Exchange Brokerage Companies	- Securities Brokerage Companies - Stock Exchanges - Clearing, Settlement and Central Depository Institutions - Fund/Asset Management Firms - Custodian Companies	- Property and Causality Insurance Companies - Life Insurance Companies - Contractual Saving Firms (Private Pension Funds)	- Mortgage Finance Activity / Companies - Mortgage Finance Subsidy and Guarantee Fund	- Financial Leasing Companies - Factoring Companies

		- Investment Banking Firms - Independent Financial Advisory Firms			

Source: Researcher

In 2004, a new cabinet that was appointed at that time, comprised a new Ministry of Investment and was given oversight responsibilities for the entire non-bank financial sector. This was with the aim of achieving synergies, and better coordination across all activities and resolve some of the long-standing problems and issues that could not be resolved unless there was one line minister handling these issues. The following table presents the baking and non-banking financial sector regulatory landscape post the promulgation of the new banking law in 2002 and the aggregation of all non-banking financial services regulators under the MoI in 2004.

Table 2.3: Egypt's Financial Sector Regulatory Structure Between 2004 and 2008

Line Minister (s)	President/PM	MoI			
Regulatory Body	CBE	CMA	EISA	MFA	GAFI
Regulated Entities	- Banks - Foreign Branches of Banks - Foreign Exchange Brokerage Companies	- Securities Brokerage Companies - Stock Exchanges (in terms of approving trading and membership rules) - Clearing, Settlement and Central Depository Institutions	- Property and Causality Insurance Companies - Life Insurance Companies - Contractual Saving Firms (Private Pension Funds)	- Mortgage Finance Companies - Mortgage Finance Subsidy and Guarantee Fund	- Financial Leasing Companies - Factoring Companies

		- Fund/Asset Management Firms - Custodian Companies - Investment Banking Firms - Independent Financial Advisory Firms			

Source: Researcher

With the appointment of a new CBE governor and the establishment of the MoI, the GoE drafted and started the implementation of Phase I (2004-2008) and Phase II (2009-2012) of the FSRP with the CBE and MoI the main two implementing bodies of the FSRP. An important regulatory change that took place in 2009 with the commencement of the implementation of Phase II (2009-2012), was merging all NBFIs regulatory institutions, namely; CMA, EISA, and MFA with all functions being transferred to the Egyptian Financial Supervisory Authority (EFSA), established as per the Law Number 10 for the year 2009. Furthermore, the law stripped the regulatory functions of Financial Leasing and Factoring from GAFI and moved it to EFSA.

Table 2.4: Egypt's Financial Sector Regulatory Structure Post 2008

Line Minister (s)	President/PM	PM/MoI			
Regulatory Body	CBE	EFSA			
Regulated Entities	- Banks - Foreign Branches of Banks - Foreign Exchange Brokerage Companies	- Securities Brokerage Companies - Stock Exchanges (in terms of approving trading and membership rules)	- Property and Causality Insurance Companies - Life Insurance Companies - Contractual Saving Firms (Private	- Mortgage Finance Companies - Mortgage Finance Subsidy and Guarantee Fund	- Financial Leasing Companies - Factoring Companies

		- Clearing, Settlement and Central Depository Institutions - Fund/Asset Management Firms - Custodian Companies - Investment Banking Firms - Financial Advisory Firms	Pension Funds)		

Source: Researcher

It is worthy of mention that Phase I of the Financial Sector Reform Program witnessed smooth implementation driven by; the robust economic growth of Egypt's economy during that years, benign international economic and financial conditions in addition to the relative political stability witnessed during those years. Phase II of the reform program was interrupted significantly at its early stages with the international financial crisis in late 2008 and the January 25, 2011 and June 30, 2013 revolutions.

The following sections of this chapter will cover in details the reform measures undertaken during the two phases of FSRP, covering the banking sector, insurance and contractual savings (pensions) sector, and mortgage finance. Capital markets specific reforms will be presented in the next chapter.

2.3.1 Banking Sector Reforms

2.3.1.1 Banking Sector Prior to the FSRPs

The Egyptian banking sectors witnessed various waves of reforms with the most astounding commencing since the promulgation of Law 88/2003 and the implementation of the two phases of the FSRPs commencing in 2004 as mentioned earlier.

Prior to implementing Phase I (2004 - 2008) and Phase II (2009 – 2012) of the FSRP, the banking system had 57 banks, out of which 7 were state owned. The seven state owned banks were as follows; National Bank of Egypt, Banque du Caire, Banque Misr, and Bank of Alexandria in addition to three specialized banks, namely, Industrial Development Bank of Egypt, The Egyptian Arab Land Bank, and the Principal Bank for Development and Agricultural Credit. In addition to the direct state ownership, state-owned banks had substantial ownerships in 23 joint-venture banks.

Table 2.5: Number of Banks Operating in Egypt (2000 – 2004)

End of June	Commercial State-owned Banks	Commercial Private & Joint Venture Banks	Off-shore Banks	Specialized Banks	Total No. of Banks	No. of Branches*	Banking Density**
2000	4	35	20	3	62	2509	25.8
2001	4	35	20	3	62	2537	26
2002	4	35	20	3	62	2566	26.5
2003	4	35	20	3	62	2599	26.6
2004	4	35	19	3	61	2800	24.6
* End of December **** Population in thousands Per banking unit**							

Source: CBE annual report, various issues.

An additional important characteristic of the banking system before implementing the FSRPs was being undercapitalized with significant non-performing-loans (NPLs), especially by state-owned-enterprises (SOEs) towards state-owned banks and other

private sector banks. This NPLs were a results of lax-lending procedures for both state-owned and private enterprises. It is worthy of mention that Egypt's economy is a bank-based economy with banks dominating the financial sector in general, and hence, having a weak and insolvent banking sector had significant detrimental effects on financing economic growth prior to the implementation of the FSRP. Furthermore, banking density[3] reveals that the banking sector was characterized as being over-banked and under-branched, which had affected the penetration rate of financial services in Egypt and hindered achieving any financial inclusion targets.

Chart 2.1: Banks Nonperforming Loans to Total Gross Loans (%)
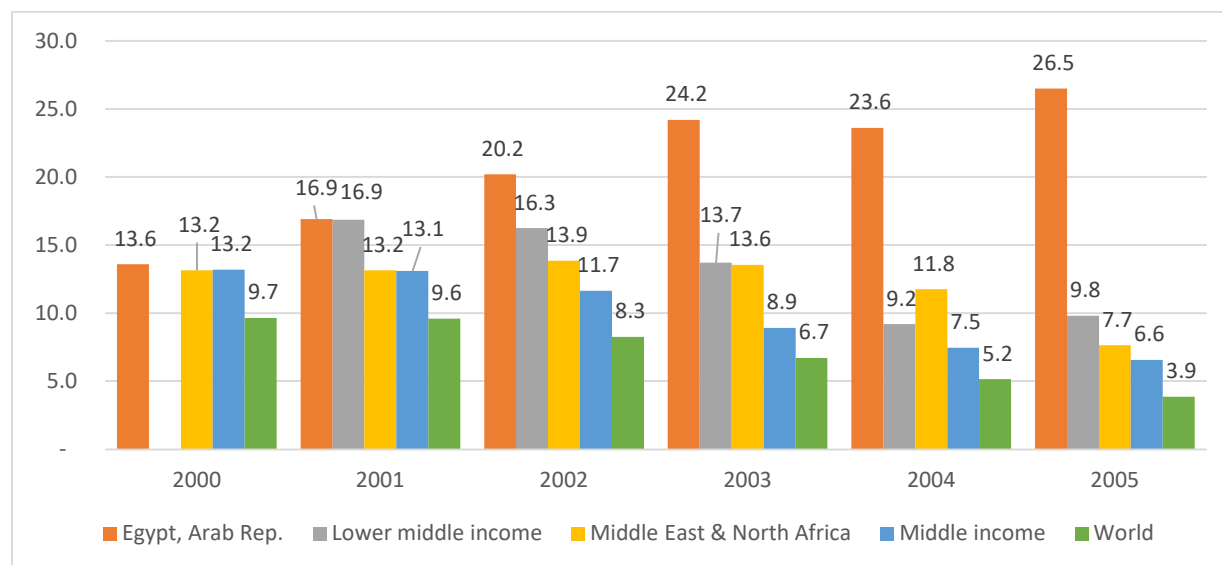
Source: WB Database, CBE Annual Reports, Various Issues

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[3] Population in thousands per banking unit

2.3.1.2 Banking Sector During the FSRPs Implementation

As dictated by the Law No. 88/2003 which increased the minimum capital requirements for banks operating in Egypt from EGP 50 mn to EGP 500 mn, and the efforts from the CBE towards reforming the banking sector with the support and funding from the GoE represented by the MoF and the MoI, several banking sector transactions and reforms took place starting from 2004.

The consolidation of the banking system in Egypt was implemented by various approaches, *inter alia*; merging of some banks into other banks after acquiring outstanding shares as an initial step with the acquired bank ceasing to exist post merger; the divesture of state-owned banks ownerships in joint venture banks; privatizing state owned banks to private sector banks; merger of some banks with state-owned banks with the continuation of the acquired bank, and merging several banks and establishing a new bank owning and operating all assets of the merged banks. The banking sector restructuring transactions are presented below.

Table 2.6: Divestures, Acquisition and Mergers with follow on transactions

Name of Final Entity	Divestures & Acquisitions followed by Mergers			Mergers, & Mergers followed by Acquisitions		
	Divesting/Selling Bank(s)/Entity	Acquired Bank Shares	Acquirer	First Bank(s)	Second Bank	New Entity
Arab African International Bank	1) Banque du Caire 2) Industrial Development Bank	Misr America International Bank	Arab African International Bank	Misr America International Bank	Arab African International Bank	Arab African International Bank
National Societe General Bank	Banque Misr	Misr International Bank	National Societe General Bank	Misr International Bank	National Societe General Bank	National Societe General Bank

Credit Agricole Egypt				American Express (Egypt Branches)	Egyptian American Bank	Egyptian American Bank
				Credit Lyonnais Branch	Credit Agricole Indosuez	Calyon
	Bank of Alexandria	Egyptian American Bank	Credit Agricole Calyon	Egyptian American Bank	Calyon	Credit Agricole Egypt
Ahli United Bank	Bank of Alexandria	Delta International Bank	Ahli United Bank	1) Delta International Bank 2) International Islamic Bank for Investment & Development 3) United Bank of Egypt		Ahli United Bank
Societe Arabe Internationale de Banque	N/A	National Bank of Port Said	Societe Arabe Internationale de Banque	National Bank of Port Said	Societe Arabe Internationale de Banque	Societe Arabe Internationale de Banque

Source: CBE annual report, various issues

Table 2.7: Divestures & Acquisitions

Divesting/Selling Bank(s)/Entity	Acquired Bank Shares	Acquirer
Banque du Caire	Banque du Caire Barclays (Barclays Bank)	Barclays Bank, UK
National Bank of Egypt	National Societe General Bank	Societe General, France
National Bank of Egypt	Commercial International Bank	Ripplewood Holdings (consortium)
National Bank of Egypt	Suez Canal Bank	Arab International Bank
Banque Misr	Misr Romania Bank	Blom Bank
Bank of Alexandria	Egyptian Commercial Bank	Piraeus Bank
Government of Egypt	Bank of Alexandria	San Paolo Bank
Government of Egypt	Banque Misr	Banque du Caire
1) Banque du Caire 2) National Investment Bank	Alexandria Commercial & Maritime Bank	United National Bank of Emirates
Government of Egypt	Egyptian Arab Land Bank	Housing & Development Bank
1) National Bank of Egypt 2) Bank of Alexandria	Egyptian-Saudi Finance Bank	Sale of shares via the stock exchange

Source: CBE annual report, various issues

Table 2.8: Banking Sector Mergers

First Bank(s)	Second Bank	New Entity
Misr Exterior	Banque Misr	Banque Misr
Mohandes Bank	National Bank of Egypt	National Bank of Egypt
Bank of Commerce & Development	National Bank of Egypt	National Bank of Egypt
Egyptian Workers Bank	Industrial Development Bank	Industrial Development Bank

Source: CBE annual report, various issues

According to the above restructuring transactions conducted in the banking sector in Egypt, the number of banks declined significantly to reflect the consolidations that took place during the FSRPs years, especially in Phase I (2004-2008) of the reform program and despite this decline in number of banks, bank branches increased steadily by higher rates than population growth as reflected by banking density that declined from a high of 26.6 in December 2003 to 22.1 in December 2009. As observed from the following table the number of banks operating in the Egyptian market declined from 61 banks and foreign bank branches to 39 by the year 2011. Despite that this was not a target per se, as opposed to the adequate capitalization, the fragmentation of the Egyptian banking sector represented a bottle neck for any structural, operational and managerial reforms that took place alongside the consolidation of the banking sector.

Table 2.9: Number of Banks Operating in Egypt (2004 – 2011)

End of June	Commercial State-owned Banks	Commercial Private & Joint Venture Banks	Off-shore Banks	Specialized Banks	Total Number of Banks	Number of Branches*	Banking Density**
2004	4	35	19	3	61	2800	24.6
2005	4	34	18	3	59	2895	24.6
2006	4	29	7	3	43	3000	24.2

2007	3	28	7	3	41	3205	23.3
2008	3	27	7	3	40	3382	22.5
2009	2	27	7	3	39	3504	22.1
2010	2	27	7	3	39	3546	22.3
2011	2	27	7	3	39	3610	22.3

Source: CBE annual report, various issues

It is worthy of mention that several other reforms were implemented during the FSRPs that significantly positively affected the performance of the banking sector in Egypt. The most important course of reforms that took place during the implementation spans of the two FSRPs was improving the supervisory capacities and approaches by the CBE and reducing the information asymmetry regarding the credit information of borrowers, whether consumer or corporate loans.

Some of the reforms (CBE Annual Reports, Various Issues) implemented during Phase I of the FSRP are presented below as follows:

1) On the supervisory fronts: The CBE improved the inspection procedures not only to cover the appropriate representation of its financial statements and ensuring that banks are following all circulars and regulations issued by the CBE, but also to cover other aspects such as capital adequacy of banks, assets quality, liquidity position assessment and assessing banks' capacity in determining, quantifying and managing various risk exposures. Furthermore, and as an early warning mechanism, the CBE further developed its inspection schedule to be conducted regularly in addition to ad-hoc inspections should the banking supervision department deem any risk or violation that is deemed significant enough to conduct unscheduled inspections.

2) On the technological development fronts: starting from the Fiscal Year (FY[4]) 2002/2003, the CBE started requiring all banks' branches to be connected and linked electronically to their head offices. This enabled the banks in monitoring the performance of branches and ensure that there is no misuse by borrowers. Furthermore, another requirement was implemented pertinent to linking all bank head offices with the CBE for swift data gathering and analysis.

3) On the information asymmetry front: The CBE developed a database within the CBE for all borrowers of more than EGP 40,000 with all banks participating in this data base, in addition to the database pertinent to delinquent and default clients which are considered negative list of all clients that are deemed to be risky to deal with the banking system and establishing the NPL unit to deal with all public and private sector banks NPLs.

4) Amending the law 88/2003 by the law 93/2005 which set the regulatory framework for the establishment of private credit bureaus in Egypt. This reform measure was of paramount importance to reduce fraud cases within the banking system and reduce information asymmetry significantly that led to a significant improvement in the quality of banks' loan portfolios. Accordingly, the first private credit bureau, i-Score, was established in Egypt in 2005 with the participation of 25 banks, the Social fund for Development (SFD), and obtained the CBE Board approval on the 30th of August 2005. It is worthy of mention that the information participatory entities are not only banks, but also other non-bank financial institutions such as

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[4] Fiscal Year starts July and end June in the next year.

financial leasing, mortgage finance, and micro-finance companies that exchange information with i-Score.

Chart 2.2: Banks Nonperforming Loans to Total Gross Loans (%)
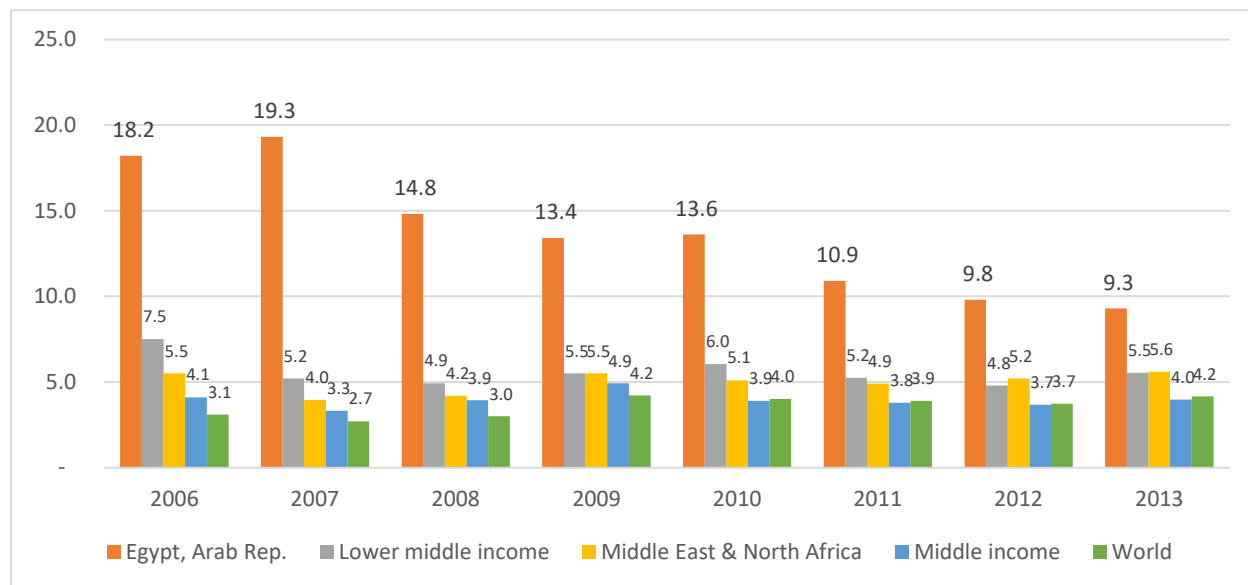
Source: WB Database and CBE Annual Reports, Various Issues

As can be envisaged from the previous chart, the banking system non-performing-loans where significantly above peer countries. However, the trend following the commencement of the FSRP was on a declining trajectory from a high of 26.5% in 2005 due to forcing banks to account for and represent the true figures of the NPLs, to reach 9.3% by 2013 which is still higher than peer countries, however, with significant improvement. In the FY 2004/2005 the SOEs NPLs to state-owned commercial banks have reached EGP 32 bn by end of year. However, due to the understanding of the impact of these NPLs and its huge impact on the banking sector's capital, the GoE adopted a reform plan to resolve this NPL issue.

Further efforts contributing to resolving the NPLs problem, especially between public sector banks and SOEs, was the establishment of the NPLs Unit at the CBE to deal with all NPLs on a commercial basis and differentiating between normal bankruptcy situations due to economic conditions in Egypt and other cases that was due to fraud or use of the lax lending procedures present in the Egyptian banking system prior to 2005. These efforts, in conjunction with the efforts exerted by the MoI - which oversaw all SOEs at that time - led to resolving all SOEs NPLs during a span of five years. Part of the plan was to provide banks with SOEs' unutilized assets such as parcels of land replacing banks debt, writing off some debts while recapitalizing banks. For example, 30% of SOEs NPLs to BoA was written off as of 30 June 2004 and the remaining amount standing at EGP 6,891 mn was paid in cash to the BoA from the state budget. Furthermore, the privatization proceeds of BoA (EGP 9.107 bn sold to Intesa san Paolo) was redirected to settle other NPLs owed by SOEs to state-owned commercial banks. In effect, the overall SOEs NPLs were settled and written off, while public sector banks where recapitalized. All of this led to a solid and sound banking sector as will be presented in the coming section.

Table 2.10: Egypt's Banking Soundness Indicators (%)

Indicators (%)	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
First: Capital Adequacy												
Capital Base to Risk Weighted Assets	NA	NA	NA	NA	NA	NA	14.7	15.1	16.3	15.9	14.9	13.4
Tier 1 Capital to Risk-Weighted Assets	NA	NA	NA	NA	NA	NA	11.5	12	12.7	13.3	12.9	11.5
Net Worth to Assets	4.8	5.3	5.1	5.3	5.6	5.1	6.2	6.4	6.7	6.8	7.2	6.9
Second: Asset Quality												
Nonperforming Loans to Total Loans	NA	NA	NA	NA	NA	NA	14.8	13.4	13.6	10.5	9.8	9.5
Loan Provisions to Nonperforming Loans	NA	NA	NA	NA	NA	NA	92.1	100.4	92.5	94.5	97.1	68.9
Loans to Private Sector to Loans to Customers	NA	NA	NA	NA	NA	NA	83.9	81	80.5	81	82.2	83.6
Third: Earnings												
Return on Average Assets	0.7	0.5	0.5	0.6	0.7	0.8	0.8	0.8	1	0.8	1	1
Return on Average Equity	12.4	8.9	9.8	10.6	12.3	14.3	14.1	13	14.3	11.7	13.9	13.9
Net Interest Margin	1.2	1.3	1.2	1.3	1.3	1.4	1.7	2.2	2.3	2.6	3.5	3.5
Fourth: Liquidity												
Liquidity Ratio												
Local Currency	28.4	31	28.5	34.9	38	27.9	34.5	43.4	44.7	55.6	58.4	59.6
Foreign Currencies	43	48.1	53.4	52.7	51	55	46.8	41	40.6	51.8	56.3	57
Securities+ to Assets	9.7	10	10.3	11.2	14.8	12.3	12.2	13.8	18	18.7	21.9	19
Deposits to Assets	66.8	69.8	72.9	73.7	74.7	69.3	78.4	82.4	81	82.5	82.7	76.2
Loans to Deposits												
Total	72.7	65.8	64.2	59.3	57	54.4	57.7	52.7	51.8	50.2	48.1	46.3
Local Currency	78.3	72.2	73.4	63.2	57.9	53.6	52	46.5	44	45.7	45.8	43.1
Foreign Currencies	58.1	52.4	45.1	49.8	48.2	56.4	71.3	69.3	75.8	62.5	56.1	56.1

Source: CBE Database, Monthly Statistical Bulletin, various issues
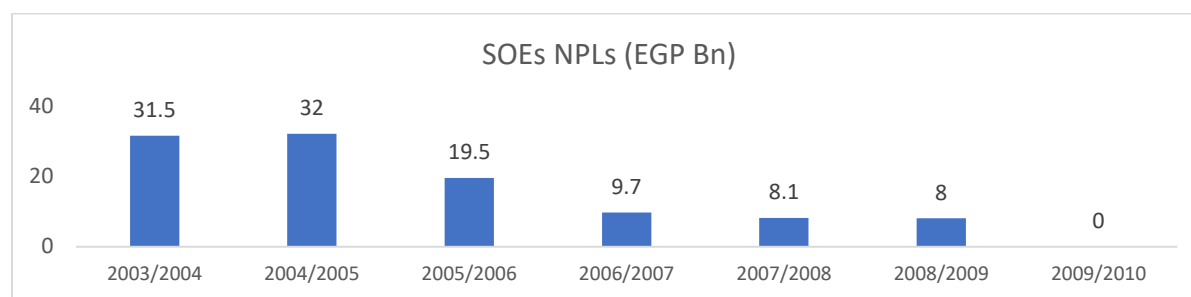
Source: MoI Annual Reports, Various Issues

2.3.1.3 Impact of the FSRP on Banking Indicators

All structural, regulatory and information technology reforms targeted to improve the financial soundness of the banking indicators in the banking system. It is worthy of mention that since 2008 the CBE adopted BASEL II capital adequacy requirements and principles which expanded the level of analysis regarding the banking assets. As it can be inferred from the previous table, the banking system financial soundness indicators improved across the year, especially on the NPLs front whereby it declined from a high of 26.5 in 2005 to 9.5 in FY 2012/2013. Another important indicator is banks' net worth to assets whereby it increased form 4.8 in FY 2001/2002 to 6.9 in FY 2012/2013 indicating a significant improvement in banks' valuations as a percentage to its assets.

Despite the evident improvement in the financial soundness indicators, this was masked by three intertwined factors that are impacting the effectiveness of the banking system in performing its function, mainly; financial intermediation to finance economic growth. The first of these factors was the GoE's sizable budget deficit that was financed via banks subscribing to the issuances of treasury bills and bonds, the stringent lending procedures

that was the extreme of having lax lending procedures prior to the implementation of the reform program, the risk aversion adopted by the banking sector in lending the private sector. All three factors led to a significant decline in loans to deposits ratio from 72.7% in FY 2001/2002 to 46.3% in FY 2012/2013 reducing the effectiveness of many monetary policy tools; namely, interest rates, on the real economy. It is worthy of mention that Phase II (2009-2012) of the FSRP was mainly targeting improving financial intermediation and access to finance. From the abovementioned figures regarding loans to deposits it seems that this target has not been achieved, however, the targets of Phase I (2004-2008) aiming at improving the financial soundness of the banking sector have been achieved and enabled the banking system in Egypt to withstand the international financial crisis and the aftermath of the turbulent period witnessed during and after Egypt's two revolutions on the 25th of January 2011 and the 30th of June 2013.

The banking sector reforms should have had a positive impact on Egypt's capital markets, not only because of the overall improvement of the financial intermediation process, and the financial soundness of the banking sector, but also given that several of the aforementioned restructuring transactions that took place in Phase I (2004-2008) of the FSRP took place via the stock market as several banks were listed on The EGX before the restructuring transactions. However, given that the banking sector reforms were not capital market specific reforms, the FSRPs will be factored in to determine their impact on the time-varying efficiency of the stock market on an aggregate level via creating a dummy variable that reflects the date of commencement of Phase I (2004-2008) of the FSRP and onwards and assess if on aggregate this had an impact on the time-varying

efficiency of the stock market at large or not as will be described in details in later chapters. In other words, July 2004 will be considered the financial sector liberalization date, and hence used as the proxy to measure the time-varying efficiency of the stock market pre and post that date.

2.3.2 Insurance Sector Reforms and Measures

The insurance sector is of vital importance for the financial and economic development in any Economy. Despite that the insurance sector is well rooted in Egypt's economy with the insurance activities and services being provided more than a century, the insurance activity in terms of premiums to Egypt's Gross Domestic Product (GDP) is still below potential on a standalone basis and even when compared to other emerging economies. Having said that, the insurance sector always grows when discretionary income and economic growth improves.

2.3.2.1 Insurance Sector Prior to FSRPs Implementation

Prior to the implementation of the FSRPs, the insurance sector faced significant structural problems; mainly, 1) undercapitalized state-owned insurers (SOIs), and in some cases, almost insolvent SOIs, 2) underpriced and unprofitable mandatory Motor Third Party Liability (MTPL) insurance, 3) transfer pricing and cross subsidy between life, and property and casualty insurance services provided by the same insurer, 4) underfunded and poorly managed private pension funds, 5) unfunctional regulatory framework regarding insurance brokers that did not permit the existence of corporatized insurance

brokers, and last but not least, 5) a lack of actuarial capacity at the regulatory front and the dominance of rule based regulations and not risk based regulatory framework.

On the SOIs front, and at the outset of the FSRPs, the SOIs were Misr Insurance Company, Al Chark Insurance Company, National Insurance Company and Egypt Reinsurance Company. Apart from Egypt Reinsurance, all remaining three SOIs offered both Property and Causality, and Life insurance services with significant cross subsidy between services. Furthermore, the National Insurance Company was significantly insolvent mainly driven by National Insurance life insurance policies that witnessed significant deficit in the actuarial reserve due to mispriced life insurance policies provided to some government entities, and Al Chark was not capable of quantifying and identifying its outright and contingent liabilities. This led that Al Chark was almost on the verge of being unable to meet its obligations to its policy holders. Additionally, Egypt Reinsurance Company, despite being solvent, suffered from improper pricing for reinsurance policies placed by direct insurers and did not operate on a purely commercial basis.

Regarding the mandatory MTPL insurance, and prior to the FSRP, all insurance policies were provided by SOIs with no interest from private sector insurers to participate in this type. This was mainly due to the mispricing of this policy.

Chart 2.4: MTPL Insurance Premiums pre Law No.72/2007

Bar chart titled "EGP Millions" (vertical axis, range 0 to 180) showing Public Sector and Private Sector premiums:

Year	Public Sector	Private Sector
2000/01	134.1	10.0
2001/02	133.2	7.5
2002/03	142.0	2.0
2003/04	154.7	1.0
2004/05	147.2	1.1
2005/06	146.3	3.5
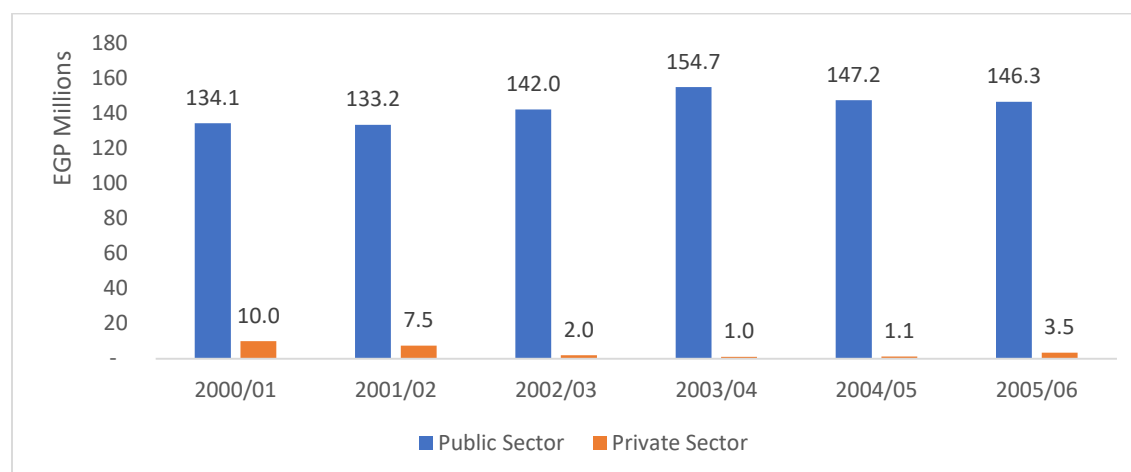
Source: EISA Annual Reports, Various Issues

2.3.2.2 Insurance Sector During the FSRPs Implementation

Restructuring State Owned Insurers (SOIs)

Similar to the banking sector, significant restructuring took place regarding the SOIs, whereby an Insurance Holding Company (IHC) has been established and all SOIs were combined under this company. In December 2007, Al Chark and Egypt Reinsurance were merged into Misr Insurance. Furthermore, the real estate portfolio of all insurance companies has been spun off and a specialized real estate company under the IHC has been established. The aim of spinning off the real estate portfolio was to ensure that state owned insurance companies are focusing on their core business.

Another important pillar in the restructuring of SOIs is the issuance of Law Number 118/2008 amending the Insurance Law Number 10/1981. The amendment reiterated on the regulatory requirement of having an activity specialization such that each insurer can

provide only one type of service; either Life or Property and Causality. Accordingly, another set of reforms took place by splitting and merging all life insurance activities in one company, and property and casualty in another insurance company. Accordingly, Misr Insurance was the company specialized in property and casualty and all of its life liabilities and corresponding assets been spun off to Misr Life Insurance (formerly, National Insurance company), which became he SOI specialized in life insurance, and all of its property and casualty liabilities and corresponding assets merged to Misr Life.

Table 2.11: Ownership Structure of SOEs pre the FSRPs

Direct Ownership: Ministry of Finance (MoF)			
Misr Insurance Company	Al Chark insurance Company	National Insurance Company	Egypt Reinsurance Company
Line of business: **- Property and casualty** **- Life** **- Real estate assets management**	Line of business: - Property and casualty - Life - Real estate assets management	Line of business: - Property and casualty - Life - Real estate asset management	Line of business: - Reinsurance

Source: MoI and EISA Annual Reports, Various Issues

Table 2.12: Structure of SOI post the FSRPs

Indirect Ownership: Ministry of Finance (MoF)			
Direct Ownership: Insurance Holding Company (IHC)			
Misr Insurance Company,	Misr Life Insurance	Misr for Real Estate Assets Management	Misr Financial Assets Management
Line of business: **- Property and casualty** **- Reinsurance**	Line of business: - Life insurance	Line of business: - Real estate development and management	Line of business: - Financial assets management

Source: MoI and EISA Annual Reports, Various Issues

Resolution of MTPL Insurance Mispricing

On the MTPL front, the GoE amended the prices of the MTPL insurance via the issuance of the Law Number 72/2007 that replaced the Law 652/1955. The new law set the

regulatory framework and process for further increases in the pricing of MTPL insurance by giving powers to EFSA board to propose amendments to MTPL insurance pricing after the coordination with the Ministry of Interior and approval of the Prime Minister. This significant amendment reinvigorated private sector participation in the MTPL insurance, and indeed, the private sector improved significantly in terms of activity and market share.

Chart 2.5: Re-emergence of Private Sector Insurance in MTPL Insurance
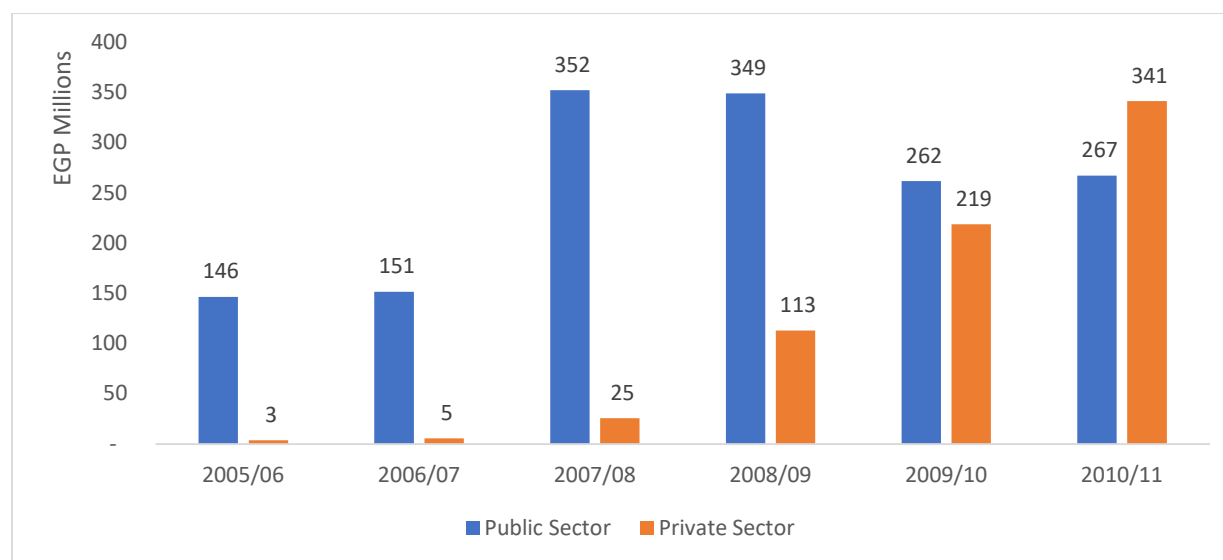
Source: EISA Annual Reports, Various Issues

Reducing Cost of Conducting Business and Other Regulatory Amendments

Another important reform was pertinent to reducing cost of conducting the business. Law Number 143/2006 was issued amending Law Number 111/1980 that significantly reduced stamp duties on various insurance lines and premiums. Furthermore, Law Number 4/2006 amending Law Number 106/1976 that increased the minimum threshold for insuring real estate construction from EGP 150,000 to EGP 400,000 and obtaining construction permits as this activity was not profitable for insurers (EISA Annual Reports, Various Issues).

In addition to the above, Law 118/2008 set the regulatory framework that enabled the corporatization of insurance brokerage function. This was an important cornerstone for attracting foreign and domestic companies to establish insurance brokerage companies in Egypt. Additionally, the law stipulated that all insurance companies should abide by Egyptian Accounting Standards issued by the Ministerial Decree Number 243/2006 and amended by the Ministerial Decree Number 234/2008 in classifying assets. This increased the level of transparency of insurers balance sheets and improved the risk capital calculations. In terms of marketing insurance certificates, and reducing the cost of insurance underwriting, banc-assurance has been developed, and reintroduced on a sound and sustainable basis.

All of the above had an impact on improving insurance sector activity and relative importance to the economy whereby, the insurance premiums increased because of the abovementioned reforms and measures.

2.3.3 Mortgage Finance Reforms and Measures

Prior to 2001, real estate finance in Egypt was non-existent. Part of it was the lack of a wide array of financial services offered by the banking sector from the one hand, and lack of the legal and regulatory framework that would enable non-depository financial institutions to avail financing to potential home owners.

In 2001, the Mortgage Finance Law No. 148/2001 was promulgated by the president. The law set the regulatory framework for expedited foreclosure of the housing unit in case of default, set new methods for borrowers' income recognition, and set the requirements for the establishment of mortgage finance companies to operate in the Egyptian market and not only banks. Furthermore, the law stipulated the establishment of the Mortgage Finance Authority to oversee the mortgage finance market and the establishment of Subsidy and Guarantee Fund (SGF) for low income housing mortgages. Having said that, it was not until the year 2004 that Egypt has witnessed significant activity in the mortgage finance market activity. Between the years 2004-2009, the mortgage finance activity was mainly driven by the following reforms:

1) Setting up the first credit scoring company that was mentioned earlier in the banking reforms. This was one of the main requirements by both market participants banks and mortgage finance companies as enabled lenders to identify the credit worthiness of the incumbent borrowers and allowed for the gradual creation of high quality portfolio of loans.

2) Mortgage finance companies that were established as per the law, always faced significant issues in obtaining long term financing due to the lack of development of long term debt markets in Egypt. Accordingly, in 2006, a refinancing liquidity facility to aggregate and refinance mortgages availed to the public has been established with ownership from banks, namely; The Mortgage Refinance Company. Its aim was to create another layer of funding facilities to the mortgage finance companies and banks.

3) Issuing the legal framework for the issuances of Mortgage and Asset Backed Securities: the regulatory framework for issuing bonds backed by a portfolio of mortgage or any other type of loans was not present until 2006. The new regulations were stipulated in the executive regulations of the capital market law.

4) Enforcing the housing units foreclosures in case of a default on mortgage payments was one of the key measures to partially activate the mortgage finance market. The Mortgage Finance Law No. 148/2001 set the legal framework for expedited housing unit disclosures.

Despite these reforms, the mortgage finance market is still very small in the Egyptian market on a relative basis. This could be mainly driven by two main reason; 1) the high interest rate environment that the economy has been witnessing for years; 2) the difficulty – despite the reduced cost - of registering the property titles and not having title insurance companies. The later has been partially resolved with the new urban areas with a new title registration system that is much simpler compared to main Cairo existing properties.

2.4 Chapter Conclusion

In this chapter we presented both the literature review covering the efficiency of stock markets and the Efficient Market Hypothesis (EMH) developed by Fama (1970). Furthermore, studies covering calendar anomalies are presented as the presence of anomalies per se is an indication of deviation from the EMH. Research covering the Egyptian stock market have been presented and summarized to determine the research gaps for the Egyptian market. Most studies showed that there is deviation from the EMH in the Egyptian case. Previous studies linking some market variables such as liquidity, price limits and financial sector liberalization relation to market efficiency has been presented.

In the continuum of the chapter, the financial sector reforms and measures implemented for restructuring and revamping the banking, insurance and mortgage finance markets and the regulatory landscape and reforms implemented during the two phases of the FSRPs have been presented. Stock market specific reforms will be presented thoroughly in Chapter 4. The depth and magnitude of reforms was unprecedented and should have had a positive impact on the time-varying efficiency of the stock market. The sectors performance improved as evidenced form the above, especially form a financial soundness perspective, however, no research was published linking the FSRPs to the efficiency of the stock market. In the next chapter, we will be presenting the research methodologies and the choice of the researcher for this research. Furthermore, the technique and model of choice will be presented that is building on this chapter.

3. Research Methodology

3.1 Introduction

The research methodology presented in this chapter aims at presenting the choice of the research methodology and research design while linking the philosophical underpinnings of social research with the capital markets from a conceptual framework.

The research process and procedure described in this chapter follows the six layers model presented by Saunders et al. (2016). The purpose of undergoing the analysis of the different layers stems from the importance and desire to put the research being conducted on the philosophical grounds.

3.2 Philosophical Underpinnings of Research

In this section, we will be discussing the three main philosophies of research with a focus on the research at hand and to reflect the statistical nature of the issue of time-varying efficiency of stock markets and how it is impacted by wide financial sector reforms. There are three main philosophies underlying social research, namely Ontology, Epistemology and Axiology. The first two are of high relevance to the research at hand and the third is of a more distant nature.

3.2.1 Ontology

Ontology is the study of reality or existence or the assumptions pertinent to the nature of this reality (Saunders et al. 2009). In different words, Ontology can be described with

discovering reality or in better terms, what is out there to be discovered. Ontological assumptions are the main guiding factor for any research conducted as it is considered the first layer of research guidance and offers the philosophical guidance to the remaining pillars of the research including the approaches, the strategies, time horizon and finally the data collection method if relevant. Relevant to this research from an ontological perspective is the reality that efficiency of stock market exists, is not constant and varies over time. Elaborating further on the last point, and according to Bryman (2015), it is of importance to address the social ontological position at hand of whether financial sector reforms positively improves stock market efficiency and its evolution over time are external to the social actors or is it a social construction build up from the perceptions and actions of social actors. The former view is referred to as Objectivism whereby it is an ontological position that implies that the reality exists as an external factor that are not influenced by the researcher or the social interaction between actors. The latter view is referred to as Constructionism whereby the reality at hand can and should be viewed as a social construction build up from the perceptions, actions, analysis of social actors.

Relating the above philosophy to the research at hand, it can be stipulated that financial sector reforms do improve stock markets efficiency and its evolvement in time exists in reality. However, the degree of efficiency depends on other social reactors, namely traders or investors. The later point will be further elaborated in epistemology as it is more related to the knowledge related to efficiency rather than the existence of stock market efficiency.

3.2.2 Axiology

Axiology is the study of values from a philosophical perspective. It represents the role of ethics in the research being conducted. How the researcher is tackling and presenting his own values in the research being conducted is used to positively influence the research. Heron (1996) argues that social interactors actions resulting in the perceived reality being researched is guided by the values of social interactors, and hence, should the values change, the perceived reality itself could change. He adds that the researcher should articulate his own values in the research as a basis for making his findings and judgements about the research at hand.

3.2.3 Epistemology

Epistemology is the study of the nature of knowledge and not reality in a certain discipline. It is about how we perceive and develop the knowledge covering the assumed reality. As per Corbetta (2003), epistemology can be described as the relationship between the observer and the observed reality, and the research aims at deriving an understanding towards the relationship between the assumed reality and the observer of this reality. Bryman (2015) stipulates that there are numerous distinct ways of developing the knowledge of reality. The different ways researchers develop knowledge in epistemology could be categorized depending on the degree of the researchers believe on how knowledge about a certain reality is developed, and the nature of reality itself and whether it is independent of a social process or interaction and judgements or not. In the following section, we will be presenting the main types of research philosophies.

3.3 Philosophies and Theoretical Perspectives

In most literature governing research philosophy, there are three main philosophies governing how knowledge and its perceived reality is developed, namely, positivism, interpretivism and realism. Saunders et al. (2016) slightly altered and further expanded the philosophies and added two philosophies to the three mentioned, namely, postmodernism and pragmatism. Below, the main relevant philosophies that could be of relevance to the research at hand are going to be presented.

3.3.1 Positivism

Adoption of a positivism philosophy in social research implies that the researcher is aiming at working with observable data to identify and posit law-like generalizations regarding a certain reality being researched (Gill and Johnson, 2010). Positivists adopt and seek an objective approach in conducting their research (Marsh and Furlong, 2002), and prefer using quantitative techniques in testing the hypothesis of the research such as mathematical and statistical modelling, experimental analysis, and survey methods (Bryman and Bell, 2015). An important assumption in positivism is that the "researcher is independent of and neither affects nor is affected by the subject of the research" (Remenyi et al. 1998). In this dissertation, and as it is going to be presented later in details, philosophical underpinnings of research in the field of capital markets and the reliance on high frequency data renders the research to be more of a positivism.

3.3.2 Interpretivism

Interpretivism implies that the researcher aims at reaching new interpretations and theories towards the research at hand rather than reaching to law-like generalizations. Interpretivists argue that any assumed reality is too complex especially in the field of business and finance, that law-like generalizations would not capture the complexity of that reality. Furthermore, proponents of interpretivism argue that the researcher has to have a deeper understanding of the process and interaction amongst social actors that yielded this reality to exist rather than only deducing generalizations about this reality, given that this reality is partially construed by the perceptions of the researcher himself (Saunders et al. 2009). Furthermore, how this reality could change should the social players and stakeholders pertinent to the research at hand change their understanding of this reality.

3.3.3 Pragmatism

Pragmatism implies that the vital determinant of the epistemology, ontology or axiology the researcher is adopting depends completely on the hypothesis and research question the researcher is trying to answer. Tashakkori and Teddlie (1998) suggest that the research should be thinking of research philosophies adopted at the research at hand as a continuum rather than opposite competing positions. They further stipulate that pragmatism is appealing to researchers given that it enables them to avoid the discussions about the truth and reality, and that any research question should be studied with the way the researcher deems relevant and appropriate, and results to be used in a manner that brings positive consequences to the researcher's value system. Saunders et. al. (2009) argue that mixed methods, both qualitative and quantitative are plausible in

any particular study and it is considered appropriate to adopt mixed methods and that this is pragmatism.

3.3.4 Realism

Realism can be contrasted to both Positivism and Interpretivism. While positivists attempt to explain the reality, and interpretivists attempt to understand rather than explain reality, critical realism attempts to explain the reality at hand, while at the same time combining this explanation with an interpretation and understanding to that explained reality. Realism in its essence is that what social interactors perceive, is the reality or the truth. Having said that, it is important to note that realism relies on the same methodological approach in achieving the perceptions of reality as positivism, in terms of relying on a scientific approach to the development of knowledge. To reach to both explanation and reality it is safe to say the realism is an iterative positivism in terms of the feedback loop generated to achieve an understanding of the social phenomena being researched and not only reaching an explanation.

It is important to contrast two types of realism: direct realism and critical realism. Direct realism is a type of realism whereby what we sense and perceive depicts the world accurately and there is no reason why researchers should believe otherwise. Critical realism on the other hand stipulates that our perceptions and sensations are images of the reality being researched and not the reality itself. Accordingly, perceptions and sensations can be deceptive. Bhaskar (1989) argues that, in critical realism, researchers

will only be able to fully understand a social observation or phenomena if he understands the social structure and interaction that yielded this social phenomenon to appear.

Saunders et. al. (2009) stipulates that critical realism requires two steps to experiencing a certain reality or the world, the first would be the social phenomena or reality itself and what the researcher senses from this reality, the second step is the mental processing of the reality or sensation after being received or meeting our senses. The first step would suffice for direct realism proponents.

3.4 Research Approaches

There are two main approaches to conduct research, namely, deductive and inductive. It largely reflects how we are going to use the theory pertinent to financial sector reforms and its impact on stock market efficiency. According to Saunders et al. (2009), there are research approached more attached or reflective of the philosophy underlying the research. It is pointed out that deductive approaches are more attached to positivism philosophy while inductive approaches are more pertinent to interpretivism philosophies. Even though it is still pointed out that such labelling could be irrelevant and of no practical value for the researcher.

3.4.1 Deductive Approach

Deductive approaches seek to find the relationships between variables including the causation. The research usually adopts highly structured methodologies to enable

replication of testing according to Gill and Johnson (2002). Saunders et al. (2009) argue that adopting the deductive approach implies pursuing scientific rigour in the research that necessitates the independence of the researcher from what is being observed. This is more achievable when relying on quantitative techniques and gather observable data. Deductive approach implies that the researcher would rely on current academic research in support of a certain theory or reality to deduce a certain hypothesis to be tested, collects data to be tested against the hypothesis assumed, draws conclusions and explanations to the theory. The following figure could summarize the deduction process.

Figure 3.1: The Deductive Process
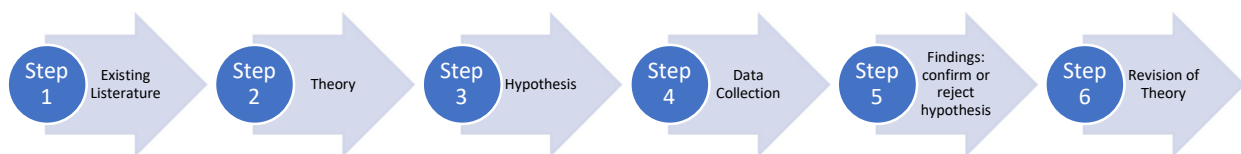
Source: The researcher and Bryman (2008)

3.4.2 Inductive Approach

As opposed to the Deductive approach, induction implies that the researcher would rely on gathered observations and data to develop a theory. It is rather common that researchers following an inductive approach in the research to rely on qualitative data and different methods in collecting data to have a better understanding of the phenomena they are researching (Easterby-Smith et al. 2008). Proponents of the inductive approach argue its superiority to the deductive approach because of its natural tendency to construct rigid methodologies that does not enable for alternative explanations of the

phenomena being researched (Saunders et al. 2009). The following figure exemplifies the inductive process.

Figure 3.2: The Inductive Process
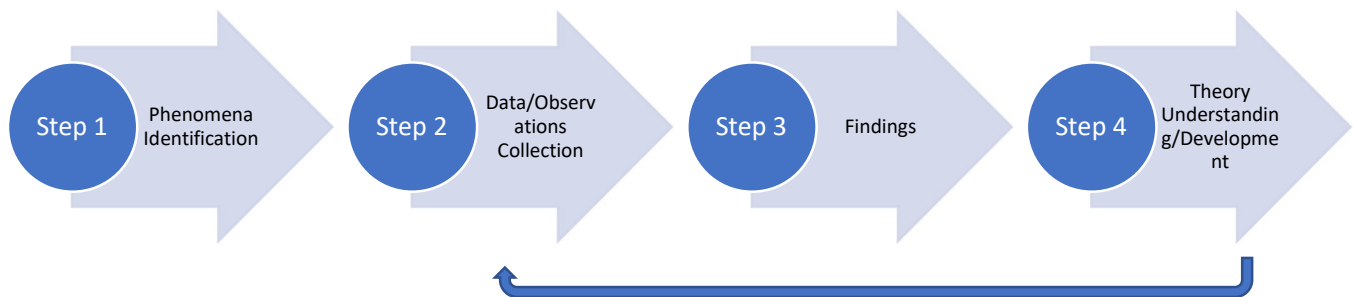
Source: Researcher

The following table adopted from Saunders et al. (2009) summarizes the different theoretical underpinnings of research and the research philosophies.

Table 3.1: Theoretical Underpinnings of Research and Research Philosophies

	Positivism	Realism	Interpretivism	Pragmatism
Ontology: the researcher's view of the nature of reality or being	External, objective and independent of social actors	Is objective. Exists independently of human thoughts and beliefs or knowledge of their existence (realist), but is interpreted through social conditioning (critical realist)	Socially constructed, subjective, may change, multiple	External, multiple, view chosen to best enable answering of research question
Epistemology: the researcher's view regarding what constitutes acceptable knowledge	Only observable phenomena can provide credible data, facts. Focus on causality and law like generalizations, reducing phenomena to	Observable phenomena provide credible data, facts. Insufficient data means inaccuracies in sensations (direct	Subjective meanings and social phenomena. Focus upon the details of situation, a reality behind these details, subjective	Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research

		realism). Alternatively, phenomena create sensations which are open to misinterpretation (critical realism). Focus on explaining within a context or contexts	meanings motivating actions	question. Focus on practical applied research, integrating different perspectives to help interpret the data
Axiology: the researcher's view of the role of values in research	Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance	Research is value laden; the researcher is biased by world views, cultural experiences and upbringing. These will impact on the research	Research is value bound, the researcher is part of what is being researched, cannot be separated and so will be subjective	Values play a large role in interpreting results, the researcher adopting both objective and subjective points of view
Data collection techniques most often used	Highly structured, large samples, measurement, quantitative, but can use qualitative	Methods chosen must fit the subject matter, quantitative or qualitative	Small samples, in-depth investigations, qualitative	Mixed or multiple method designs, quantitative and qualitative

Source: Saunders et al. (2009)

3.5 Researcher's Philosophical Choice

Before delving in elaborating the research philosophical choice pertinent to the research at hand, it might be beneficial to re-present some of the theories developed from various academic literature that are relevant to financial sector reforms and stock markets efficiency as these theories will guide the articulation of the research questions to be answered in this research. These could be summarized as follows:

1) Financial sector developments have an impact on the long-term economic growth and capital formation of any economy, and one of the indicators of financial sector

development is stock market efficiencies resulting from financial sector and capital market reforms;

2) Efficiency of stock markets exists in various degrees of strength and varies over time; and

3) Financial sector and capital market specific reforms do improve efficiency of stock markets in the market that have been researched.

It can be inferred from the abovementioned relatively well-grounded theories pertinent to stock market efficiency, that an ontological approach is being adopted, and specifically for the markets that have been researched to reach to those assumptions and theories (perceived realities and facts), however, to further build and generalize these theories, formal tests adopting a positivism approach needs to be implemented. Accordingly, some of the sub-theories of these theories will rely on epistemological underpinnings in conducting some aspects of the research.

3.5.1 Research Questions

We believe at this juncture; it is of paramount importance to reformulate/reiterate the research objectives into research questions as the most important determinant factor of the research philosophy would be the research questions as per Hanson et al. (2005).

1) Did the time-varying efficiency of Egypt's stock market improve or deteriorate over time?

2) Did the FSRPs impact the time-varying stock market efficiency in Egypt on the market level measured by the index?

3) Was the impact of the FSRPs on the market's time-varying efficiency positive?

4) Did some of the stock market specific reforms - measured using proxy variables, have an impact on the time-varying efficiency parameter on the *market level* measured by the index? Was the impact of the specific reforms positive or negative?

5) Did some of the stock market specific reforms - measured using proxy variables - have an impact on the time-varying efficiency parameter for *individual stocks*? Was the impact of the specific reforms positive or negative?

6) Is it possible to the rank the impact of the FSRP and the other reform proxy variables based on the outcomes of the statistical analysis on the market and individual stock levels?

7) Based on the above findings, is it possible to derive a guidance plan to prioritize future stock market reforms in Egypt and other emerging markets to achieve the efficiency target of any policy maker, market regulators, and exchanges?

Given the nature of the research at hand, it is safe to assume that the research will be based on positivism given the statistical nature regarding the time-varying stock market efficiency. As can be deduced from the academic literature review, indeed stock markets efficiency do vary over time depending on several aspects, among which are the reforms implemented in different periods as have been elaborated by proponents of the Adaptive Market Hypothesis (AMH) mentioned previously. However, this is only true for some of the research questions. When it comes to further expanding the theories into a framework for prioritizing stock market reforms, interpretivism will play an important role to deduce

from observations and findings should the hypothesis of improved stock market efficiency given the reforms hold, to develop the framework for prioritization.

3.5.2 Research Hypothesis

In addition to the above, it is worthy of mention that most of the research hypothesis are based on well-grounded theories pertinent to stock market efficiencies, and accordingly, the deductive approach is going to be followed in large portions of the study. Having said that, the findings or outcomes of the hypothesis are going to be used from an inductive approach to deduce future guidance for policy formulations to prioritize stock market reforms. In other words, our approach is more inclined to follow pragmatism as it will allow us to explain the results of the statistical and econometrical analysis, and using these results to further build on the theories and break down the reforms in order to rank them for policy making purposes. Postulating the research questions to hypothesis would further add clarity towards the philosophies adopted in the research as follows:

H1: Implementing the FSRPs improved the stock market efficiency measured on a time-varying basis for its general index, especially during the period whereby the reforms are implemented.

H2: Based on a priori theories, some stock market specific reforms improved the efficiency of the individual stocks measured on a time-varying basis, especially during the period where these reforms were implemented or active.

According to the above, it can be inferred that the research hypothesis follow a positivism methodology and a deductive approach given the well-grounded theories and literature covering the spectrum of stock markets efficiency from the one hand, and the availability of data and statistical nature of testing for efficiency.

3.6 Statistical Model of Choice and Specification

The purpose of this section is to present the statistical estimation model of choice and the rationale behind the choice in relevance to the targets of the research. It does not aim to present all available models of estimation, it will only refer to the limitations of the deterministic models of estimation that results in stationary coefficients rather than time varying coefficients which is the aim of this thesis.

A characteristic of stock markets is the availability of data on a high frequency basis. The research will be based on statistical estimation and inference of the time-varying efficiency estimate of the Egyptian stock market. Furthermore, and as briefly presented in the literature review, there are numerous statistical models to estimate the level of efficiency, however, most of these models result in a deterministic efficiency estimate which is the Auto-regressive coefficient of the random walk model. In other words, classical decomposition and estimation models does not allow for the parameters of the estimates to evolve through time. This is resolved by structural time series models developed by Harvey (1990).

3.6.1 Why Kalman Filters & State Space Models?

Deterministic estimates reflect the long-term average efficiency estimate of the market but does not reflect how it is evolving across time. The evolvement could be either because of market participants figuring out and adapting to the inefficiency witnessed, or because of reforms introduced that should – at least in theory – improve the stock market efficiency. The adaptation concept is what was presented earlier as the Adaptive Market Hypothesis (AMH). According to the above, a recursive optimization technique, namely Kalman Filters, is adopted to estimate the time-varying efficiency level of the stock market at large as measured by EGX's main index level, or on the individual stock level.

As mentioned in the literature review, weak form market efficiency definition implies that if future returns of the individual stocks or the main index can be fully or partially predicted using historical returns then the market for this is said to be not efficient in the weak form. Accordingly, the model implemented is based on an autoregressive of the order one (AR(1)) for logarithmic returns, while factoring in the time variation of the estimated parameter based on state space models using Kalman filter. In simple words, instead of having one single estimate for the parameter that reflects efficiency, we have a series of time-varying parameter for the efficiency estimate reflecting the evolving efficiency of the individual stock and market at large. Following the estimate of the time-varying parameter (beta) of the main index and each individual stock that has been impacted by the reforms, this parameter is being modelled using a deterministic regression model that runs the parameter against the proxy variables reflecting some of the reform measures that were implemented during the FSRP I, and FSRP II. The variables used for estimation will be

discussed in detail in Chapter 5 for the market (index) level and individual stocks. The purpose of the last step is to assess if the reforms had its expected impact on the efficiency of the stock market represented by individual stocks and at the index level.

Kalman filters are deemed more appropriate for the purpose of this study for the following reasons:

1) The model parameter do vary with new observations across time which captures the evolving component of efficiency. It allows the researchers to identify how the efficiency levels are evolving without the interference of the researcher preconception and convictions on how it should evolve.

2) Varying efficiency parameters estimates could be partially achieved with a rolling window of estimation of deterministic models, however, the optimal window length has to be arbitrary chosen which could turn problematic and be subject to researchers views rather than the natural estimation of the time-varying efficiency.

3) Recursive estimation deterministic models would require the imposition of an arbitrary choice of the break points of efficiency rather than estimating the time-varying efficiency parameter and assess the explanatory fundamentals and variables behind this variability.

4) Last but not least, state space models are more stable to any potential misspecification in the data generation model as opposed to other deterministic models.

The research philosophy of positivism and the deductive approach is being linked to the Kalman Filter techniques in the sense that the data generation function (the autoregressive model) of stocks returns are present in existing literature, and the theory governing the interpretation of the parameters are developed from previous literature also. The outcomes of the estimated models including the time-varying efficiency parameters and the explanatory powers of the other constructed proxy variables on the time-varying efficiency are going to be used to deduce the main findings of the research of the impact and rank of the various reform measures on the time-varying efficiency on the market level and on the individual stocks levels.

The following steps and models' specifications will be implemented to derive the rank of stock market reforms, and guide the policy making formulation for future reforms in Egypt and potentially in other emerging markets

3.6.2 Step 1: Estimating time-varying parameter

As mentioned previously, we will estimate the time-varying efficiency relying on an AR(1) model specification while factoring the time changing nature of efficiency by estimating a time-varying parameter of the weak form efficiency test parameter.

$$R_t = \beta_{0,t} + \beta_{1,t} R_{t-1} + \varepsilon_t \quad \varepsilon_t \sim N(0,1)$$

And the data generation function for $\beta_{1,t}$ is based on the following equation

$$\beta_{i,t} = \beta_{i,t-1} + v_{i,t} \quad v_{i,t} \sim N(0, \sigma_i^2); \ i = 0,1$$

Whereby, R_t and R_{t-1} is the return on the stock/index at time t and t-1 and $\beta_{1,t}$ is the estimated time-varying parameter reflecting how much previous or materialized returns predict future returns. In the weak form efficiency definition, this parameter should have a value of zero in case of weak form efficiency holds, implying that historical returns are not correlation and does not have any explanatory powers for future returns. Any values different than zero implies that the market for this stock/index is not weak form efficient and hence some investors can rely on historical returns in predicting future returns of this particular stock or the market at large (proxied by market index). It is worthy of mention that the estimation equations are formulated in a state space format and the Kalman Filtering process will be adopted. In other words, the time varying parameter are estimated recursively on two phases; predicting $\beta_{i,t}$ and updating the prediction through Kalman gain function based on new observations being witnessed.

The Kalman filter works on two steps or phases to estimate the time varying efficiency parameter, namely; predict and update. The prediction step is the phase whereby prediction of the required variable is conducted alongside the covariance matrix of the error terms.

The update step depends on the new observed variable and how far it is from the predicted variable and a correction is made to the prediction. The correction depends on

the Kalman gain measurement equation variance. The following figure shows the sequence of Kalman routine.

Figure 3.3: Kalman Filter Routine

Prediction Phase	Update Phase
Predict variable at time t given the information available at t-1. $$\beta_{t\mid t-1} = \beta_{t-1}$$ Prediction of the estimate of the covariance matrix of the error terms in the AR(1) model. $$Cov_{t\mid t-1} = Cov_{t-1} + \rho_t$$ whereby, $$\beta_t = (\beta_{0t}, \beta_{1t})$$ $$\rho_t = (\varepsilon_{0t}^2, \varepsilon_{1t}^2)$$	Update of the previously predicted variable at time t on the new information arising at time t based on Kalman gain Step 1: Kalman gain $$K_t = Cov_{t\mid t-1} M_t' f_t^{-1}$$ whereby, $$M_t = (1, r_{t-1})'$$ $$f_t = M_t Cov_{t\mid t-1} M_t'$$ Step 2: update variable estimated in prediction phase $$\beta_t = \beta_{t\mid t-1} + K_t O_t$$ where $O_t = r_t - M_t \beta_{t\mid t-1}$ Step 3: Update covariance matrix estimate $$Cov_t = (l - K_t M_t) Cov_{t\mid t-1}$$ Where l is the maximum likelihood (log) function estimator

Initial values for β_{t-1} and Cov_{t-1}

Source: Adapted by researcher form Arouri et al. (2010) with modifications

3.6.3 Step 2: Estimating variables impact on the time-varying efficiency

Following the estimation of the evolving efficiency estimated in the previous step, the second step is to run the ordinary least square regression(s) to identify which reforms did have an impact on market efficiency. This impact can be positive or negative and conforming to the theoretical priori of the expected impact of the reforms or not. The regression outcomes also will identify the variables that had no explanatory powers in the variability of the estimated time-varying efficiency coefficient estimated in Step 1.

$$\beta_{1,t} = Constant + \sum_{i=1}^{n} \lambda_i \, Proxy_{i,t} + \varepsilon_t$$

The proxy variables in the previous regression would vary according to the estimation on the market level proxied by EGX30 index or individual stocks level as each one of them would have a different set of variables. This will be described in detail in Chapter (6). Additionally, the variables would comprise dummy variables that takes either the value of 1 or 0 according to what needs to be measured, and in some instances, other numerical values to reflect the reform proxy variable being assessed such as the free float of companies and institutional trading as percent of total trading.

3.6.4 Step 3: Standardizing Variables Coefficients

In this step, we will be aiming at comparing the relative impact of each of the variables on the time-varying efficiency parameter. This will be based on linking the coefficient estimate (λ_i) with the standard deviation of the independent (σ_x) and dependent variables (σ_y) using the following equation:

$$Standardized\ Coefficients = \lambda_i * \left(\frac{\sigma_x}{\sigma_y}\right)$$

The purpose is to derive coefficients estimates that can be used in comparing the magnitude of the impact and rank with it the proxy variables that had the most significant impact on the time-varying efficiency parameter estimated in Step 1. The ultimate aim would be that the findings would enable policy makers in prioritizing the reforms from the one hand, and use these estimation techniques to assess the impact of these reforms on efficiency, as it could be the case that the reform yielded the desired higher trading and liquidity however, this enhanced liquidity does not improve the efficiency of the market. Accordingly, the reform measure might be having some limitations that needs to be addressed.

3.6.5 Computer Software of Choice

Despite the usefulness of state space models and its applications in the field of economics and finance, it has not been used as frequently as someone would envisage. Durbin and Koopman (2001) wrote: "In our opinion, the only disadvantages are the relative lack in the statistical econometric communities of information, knowledge, and software regarding

these models". More than seventeen years later, it is quite evident that the use of these techniques is embedded in some econometric and statistical packages that aid researchers to conduct statistically sophisticated techniques with easy to use computer programs. Furthermore, several programs have Kalman filters embedded in the standard programs, and some have dedicated statistical software for state space models. Some of the statistical programs that comprise State space models and Kalman filters are STAMP, R, MATLAB, REGCMPNT, SAS, EViews, GAUSS, Stata, RATS, gretly, and SsfPack (Commandeur et al. 2011).

The program STAMP (Structural Time Series Analyzer, Modeler and Predictor) is one of the first computer programs that incorporated State Space models in statistical and econometric computer packages. It has been developed by Simon Peters and Andrew Harvey and first appeared in 1982. It has been accepted that this package is one of the first packages based on state space models (Durbin and Koopman, 2001). It is worthy of mention that this software operates on several operating systems such as Windows, Macintosh and Linux operating systems (Mendelssohn, 2011). Furthermore, STAMP is a part of a larger family of software and econometric packages, namely; OxMetrics system.

The statistical analysis conducted in this thesis will be using the STAMP software given its stability and wide acceptance by the research community.

In the next chapter, we will be presenting in details the reforms implemented in both phases of the FSRP I and FSRP II for both the banking and the non-banking financial

sector (excluding capital markets reforms), whereby stock market specific reforms are going to be presented in Chapter Five. Worthy of mention that some of these reforms yielded numerical variables that can be used as proxy and incorporated in the statistical estimation models.

4. EGX Overview & Capital Markets Reforms

This chapter will present the capital market specific reforms/measures that took place in the FSRPs with the focus on Phase I reforms. The reforms and its reversal – in some instances - provides a unique opportunity to assess its impact on the individual stock level. These reforms should have a direct or an indirect impact on the evolvement of the level of informational efficiency of the stock market. The level of details covered in this chapter will be much higher compared to other sectors of the FSRP given that some specific reforms and measures are going to be used for specific econometric modelling to determine the impact of reforms affecting individual stocks efficiency. However, before dwelling into the details of the reforms, we will present an overview of the Egyptian Exchange and the trading markets and aggregates.

4.1 History of the Egyptian Exchange (EGX)

The EGX is one of the oldest markets established in the Middle East and Africa. The EGX was formerly composed of two exchanges; The Alexandria Stock Exchange, which was established in 1883, followed by the Cairo Stock Exchange established in 1903. The Egyptian Exchange witnessed five main periods with fundamental shifts yielding significant changes in terms of activity, level of sophistication and development. These periods are between the years 1883-1956, 1957-1971, 1972-1991, 1992-2003 and 2004-present.

The first period (1883-1956) witnessed significant activity and exponential growth in values, volumes of trading and number of listed companies. This was driven by the establishment and trading of private sector companies, which raised the required funding from the market. Combined, the Cairo and Alexandria Stock Exchanges were ranked amongst the top exchanges in terms of liquidity (EGX Website).

Table 4.1: Number and Market Capitalization of Listed Companies

Year	Listed Companies	Market Capitalization (EGP)
1903	28	29,944,620
1907	59	53,488,080
1914	27	46,846,195
1921	40	58,712,980
1928	75	150,720,465
1935	62	108,818,540
1942	116	197,515,585
1949	176	248,250,080
1953	211	216,600,000

Source: Securities Exchanges in Egypt, 1903-1953, Emel Levy, Arabic Manuscript

Chart 4.1: Number and Market Capitalization of Listed Companies
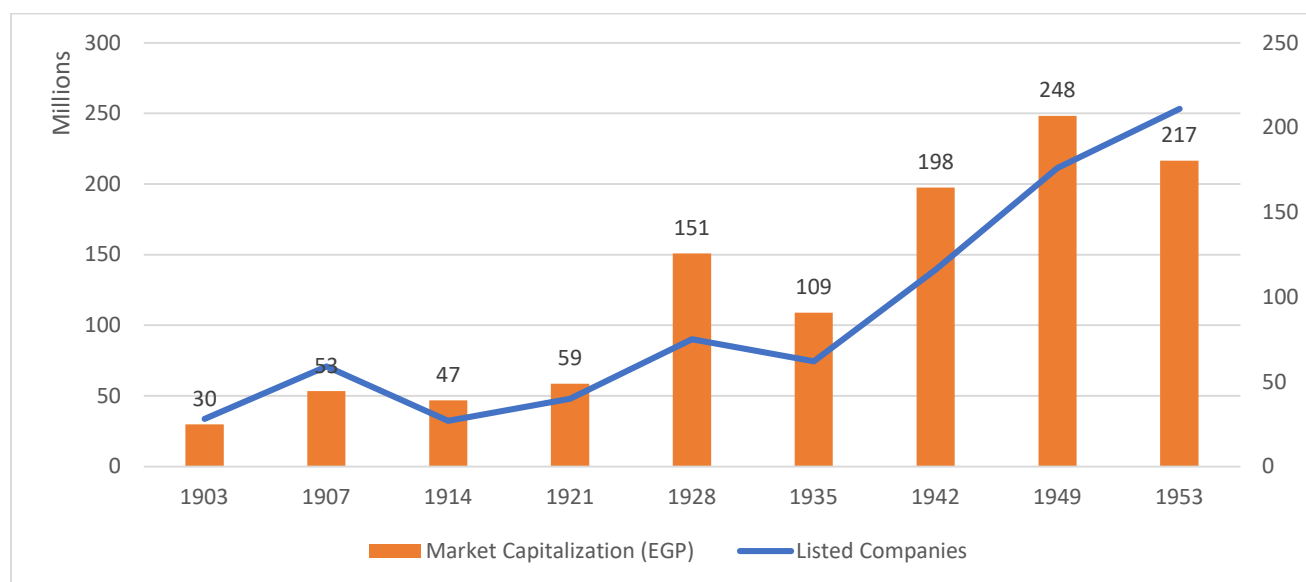
Source: Securities Exchanges in Egypt, 1903-1953, Emel Levy, Arabic Manuscript

During the second period (1957 – 1971), the Egyptian economy witnessed fundamental changes starting from nationalization of all private sector companies including the Suez Canal, breakdown of agricultural land, and moving to state driven economy, rather than a market driven economy. These factors led to the marginalization of the role of the exchanges as a mean of exchanging ownership and a platform to avail the required financing for companies. During the third period (1972 – 1991), the Government of Egypt announced the move from a centrally planned economy to a market driven economy and it was in 1981 where the corporate law was issued allowing private sector investors to incorporate companies. This led to unprecedented economic growth in the early 1980s when coupled with high oil prices at that point of time, Egypt was a net exporter of oil products and benefited from the higher oil prices only to be followed with a period of slow economic growth starting from 1985 due to the decline of oil prices and the emergence

of the first Gulf war. Having said that, the breakdown of agricultural land and the deterioration of economies of scale in farming and the rising competition from synthetic fabrics, led to the unfeasibility of activating the futures/forwards market on cotton.

During the fourth period (1992-2003), the GoE announced an Economic Structural Reform and Adjustment Program in collaboration with the International Monetary Fund (IMF). The program aimed at addressing fiscal and trade imbalances, controlling inflation and broadening the participation of the public in the economic activity via the inauguration of the privatization program by selling to strategic investors and partial floatation through the stock market. Accordingly, the Egyptian Capital Market Law number 1995/92 was issued in 1992 to reinvigorate the stock market in Egypt. These reforms increased the number of companies listed on the stock exchange significantly and raised the domestic and international interest for participation in privatized assets. This led to an increase in economic growth that positively impacted the stock market until the year 1997. Starting from 1998 and with the South-East Asian crisis, the Egyptian economy growth rates started to recede due to the rise of terrorist attacks, coupled with a stagnation of domestic led economic reforms. This had an adverse effect on the stock market in terms of activity until the year 2003.

The fifth and the most important period is during the period of Phase I (2004 - 2008) of the Financial Sector Reform Program which witnessed significant reforms. These ranged from reforms pertinent to the financial sector at large to stock market related measures. These reforms were accompanied with partial floatation of state owned and joint venture

companies in the stock market. And due to the fiscal and monetary policy reforms, GDP growth rates increased significantly and led to unprecedented increases in private sector Initial Public Offerings and Secondary Public Offerings. The stock market reform measures included the following; introducing margin trading, intra-day trading, and amending the listing requirements to increase the number of stocks traded in the market. On the regulatory front, post that period in 2009, all non-bank regulatory authorities were merged into one body, namely the Egyptian Financial Supervisory Authority (EFSA).

4.2 Structure of EGX

The EGX consists of five boards and three markets: the first market consists of the main board for listed stocks, corporate bonds board, closed ended funds board and exchange traded funds board and the small and medium enterprises (SMEs) board (Nilex). The second market consists of an OTC (over the counter – deals and orders) market for unlisted stocks and the third market is a Primary Dealers market for treasury bonds.

The number of companies listed in the EGX, are currently 210 plus 28 listed on NILEX. The market capitalization for the main market in 2010 was USD 84.1 billion and USD 0.18 billion for NILEX. The Egyptian stock market is considered an active market. Its volume of trading has increased from 2004 till 2009. Trading however, has witnessed a slowdown in 2010 and 2011 as depicted in the following chart.

EGP bn

Year	Main Market Stocks	SMEs Market, Funds, ETFs	Listed Bonds	Total Market Trading
2001	17		8	32
2002	12		14	34
2003	20			28
2004	33			42
2005	142		9	161
2006	259		11	286
2007	298		24	363
2008	456		20	530
2009	293		41	448
2010	209		63	321
2011	100		31	148
2012	128		38	185
2013	117		29	162
2014	197		67	291
2015	137		89	247
2016	187		78	285
2017	278		18	332
2018	270		63	358
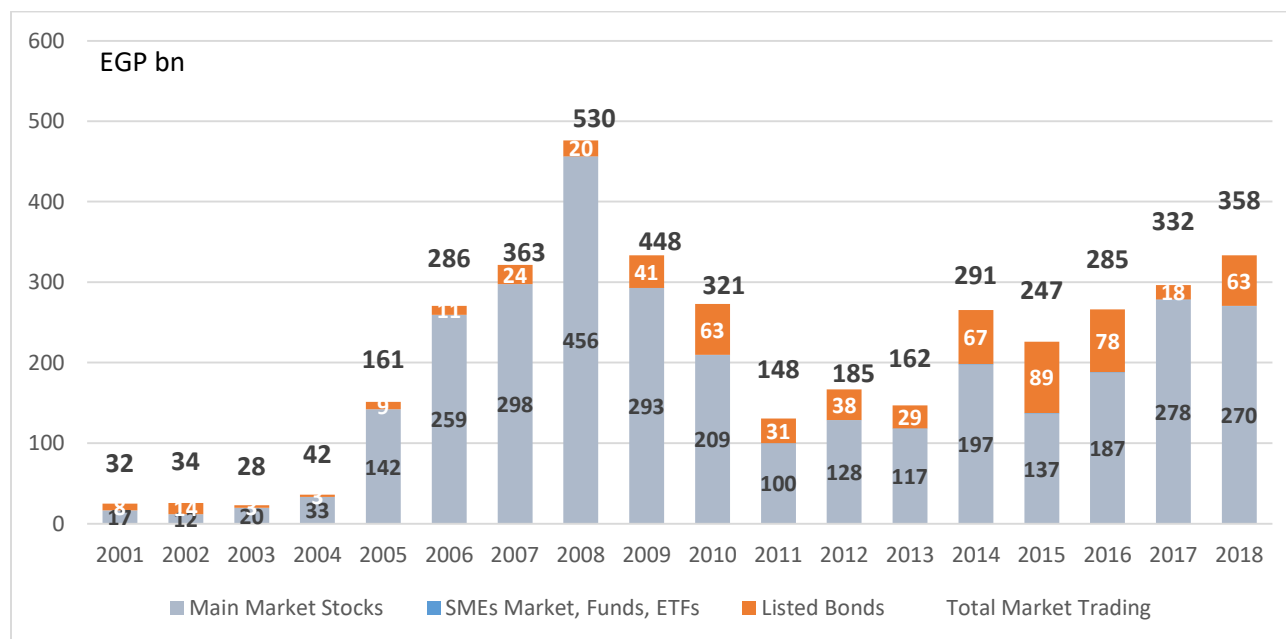
Source: Data from The EGX

The types of securities traded in these three markets are stocks, investment (mutual) funds, and corporate bonds, which all rely on a trading system called X-Stream trading system; except for treasury bonds, which rely on an electronic primary dealers system developed by the EGX. All stocks listed in the main market, investment funds and corporate bonds are traded between 10:00 am and 2:30 pm. The OTC deals market however, operates from 9:45 am till 11:15am, while the orders market from 2:45 pm till 3:15pm on Mondays and Wednesdays only.

The Egyptian Exchange issues seventeen different stock indices, which are EGX20 Capped (this one has been replaced with EGX30 Capped), EGX30, EGX50 EW, EGX70, EGX100, S&P EGX ESG, and twelve sectorial indices constituting of the following sectors: banks, basic resources, chemicals, construction and materials, financial services

excluding banks, food and beverages, healthcare and pharmaceuticals, industrial goods and services and automobiles, personal and household products, real estate, telecommunications, and travel and leisure.

The bonds market in Egypt is derived of two main bond types: corporate bonds and government bonds. Corporate bonds are structured as follows: asset backed and mortgage backed securities/bonds, fixed and one floating rate bond. Government bonds are made up of treasury bonds, housing bonds, development bonds and used to have public juristic entity bonds. Additionally, three closed ended mutual funds are listed and traded on the Egyptian stock market and one Exchange Traded Fund (ETF).

4.3 Stock Market Reforms and Measures

In this section we will present and analyze the reforms and measures implemented to develop the Egyptian capital markets. The reforms will be categorized according to their intended impact on the market; namely 1) turnover and liquidity enhancement reforms and measures; 2) improving the quality of information and information asymmetry reduction regulations; 3) volatility curbing measures; 4) market breadth and depth enhancement reforms and measures. We will analyze the intended impact of reforms on the market in general and their expected impact on market efficiency. It is worthy of mention that this section does not aim to list all reforms and measures implemented, but the measures that should have had an impact on market efficiency. Furthermore, some of the reform measures undertaken can be assessed on an individual stock level and

some other reforms impact will be assessed on a market level only. This shall be clarified with every reform measure presented below. The following table summarizes the reforms that took place in the four broad categories of reforms in the Egyptian market and the expected impact on efficiency.

Table 4.2: Reforms, Measures and The Expected Impact on Informational Efficiency

Reforms Category	Detailed Reform / Measure		Expected Impact on Efficiency
Turnover and Liquidity Enhancement Reforms and Measures	*Margin Trading*		*Positive (+ve)*
	Intra-day Trading		*Positive (+ve)*
	Collective Investment Vehicles Regulations		*Positive (+ve)*
	Introducing pre-opening session.		*Positive (+ve)*
	Online trading and omnibus accounts introduction		*Positive (+ve)*
Price Manipulation, Information Asymmetry Reduction and Transparency Reforms and Measures	*Setting the Regulatory Framework for Combating Price Manipulation and Insider Trading*		*Positive (+ve)*
	Tender Offers for Acquisition Regulations		*Positive (+ve)*
	Issuing the Listing, Delisting, and Disclosure Rules		*Positive (+ve)*
Volatility Curbing Measures	*Pre-opening Session Cancellation*		*Negative (-ve)*
	Price Limits and Trading Halts	*VWAP20*	*Positive (+ve*
		ORDER20	*Negative (-ve)*
		ORDER10	*Negative (-ve)*
Market Breadth and Depth Reforms and Measures	*Partial floatation of Government Owned Enterprises (GOE)*		*Positive (+ve)*
	Minimum free float and issuance size requirement		*Positive (+ve)*

Source: Researcher

It is worthy of mention that not all reforms and measures could result in measurable variables, and hence incorporated in our statistical analysis. The details of the reforms taking place in each category of reforms is presented in the following sections.

4.3.1 Turnover and Liquidity Enhancement Reform Measures

This category of reforms and measures aimed at increasing the volume of trading in the Egyptian market. It is widely accepted that as the activity of trading increases, the level of efficiency improves in the market. This is mainly because market participants will act swiftly and respond quicker to availed information and hence improve the efficiency level in this market. Below we will present the development and history and the regulatory framework governing these reforms.

4.3.1.1 Margin Trading

Margin trading is the mechanism that allows investors to increase the magnitude of their investments by borrowing funds from a brokerage company and / or custodian bank or company up to 100% of their equity position. Margin trading was formally introduced in the Egyptian market by the Minister of Investment Decree No. 192/2005.

This decree added a new chapter – Chapter Nine - to the executive regulation of the Capital Market Law (CML) Number 95/1992. This chapter set all the procedures required for an investor to borrow from a brokerage company and the requirements for licensing for a brokerage company to avail financing to investors. This decree stipulated all margin trading requirements from initial margin, to maintenance and variation margin.

The aim of this reform was to increase the level of liquidity in the Egyptian market by providing credit to investors to buy more securities. This in turn was positively reflected in

the volumes of trading. Some research, and as presented in the literature review, stipulate that deep and liquid markets with high levels of trading increases the price efficiency of stock markets. Additionally, high liquidity reduces the possibility of price manipulation by investors, as it turns them into price takers and hence increases again the level of efficiency.

It is worthy of mention, that the regulation governing margin trading has been amended to cope with market changes by the Ministerial Decree Number 84/2007 and the Prime Ministerial Decree Number 345/2011. The latter was a decree issued during the closure period of the Egyptian Exchange in the aftermath of the January 25, 2011 revolution. The decree decreased the margin call threshold to reduce the selling pressures that are not driven by investors' choice.

It is unfortunate that according to The EGX membership department, the data pertinent to the amount of margin availed in the market was not assimilated from brokerage companies prior to 2010. Even more, the collected since 2010 data was for the aggregated level only, and there is not a breakdown to the client or the individual stock level. The breakdown on the investor and individual stock level, started to be aggregated in 2019. This does not provide quantifiable proxy variables.

4.3.1.2 Intra-day (Same day) Trading

Intra-day trading was introduced by the Egyptian Financial Supervisory Authority Board of Directors Decree Number 24/2005. Intra-day trading allows investors to trade the

security on the same day they bought it. The introduction of this measure was essential should the investor aim to benefit from price fluctuations during the same day. It is worthy of mention that this problem is not present in international markets as investors can trade anytime they wish to do so, given the netting procedures for settlement. In Egypt the case is different, though. There is an article in the Clearing, Settlement, and Depository law Number 92/2001 that stipulates that the stock ownership is not transferred unless the stock and cash legs of the transactions are settled. This is opposed to international markets, whereby ownership of the security is transferred as trading takes place at the exchange rather than settlement, and hence settlement takes place on the net trading position of investors. The issue in the Egyptian market is that the investor could not have sold the bought stocks unless it is in his account but after the settlement cycle is complete at T+2. Furthermore, settlement in the Egyptian market is based on beneficial owner settlement rather than registered owner. For further elaboration, if the investor bought the stock on Monday, she/he will not be able to sell this stock but on Wednesday as it would not have been transferred to her/his account before the passage of two working days. This used to limit investors ability to benefit from daily price increases, or to cut their losses short in case of a significant price decline occurred after they buy the stocks. Henceforth, EFSA and EGX introduced the same day trading mechanism that enables investors to sell the newly bought shares on the same day, albeit with some limitations.

Intra-day trading increased the daily trading volume in the Egyptian market by an average of more than 8.3% reaching to a maximum of 35% in some days and a standard deviation

of 6%[5]. This increase in the activity of trading should have a direct impact on the level of efficiency in the Egyptian market. Investors should be able to respond immediately to market and company information and hence, the information should be reflected immediately in security prices and reduce the autocorrelation of security returns and improve market efficiency should the below mentioned limitations not hinder the price correction mechanism.

The limitations set by the regulations issued by EFSA for this mechanism was that there has been a ceiling on the number of shares the investor can trade using this mechanism as percentage of the issued shares by the company. The purpose of that ceiling was that the regulator - at that point of time - assumed intra-day trading is of a riskier nature than the normal trading associated with the normal settlement cycle. The maximum amount traded with this mechanism is per investor for each traded company. This could have put some limitations regarding the benefits of trading with this mechanism even though it might have resulted in an increased activity in the market. The quantity limitations could have resulted in a trading pattern of buying pressures at session opening and selling pressures around market closures which is in itself an indication of some sort of market inefficiency.

4.3.1.3 Collective Investment Vehicles Regulations

Collective investment vehicles were not formally regulated prior to the issuance of the Ministerial Decree Number 209/2007. This decree replaced Section 2 in Chapter 3 of the

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[5] Daily data was obtained from The EGX and calculations implemented by the researcher.

executive regulation of the CML 95/1992. It formally regulated and eased the process of establishing funds in the Egyptian market and introduced the regulatory framework for new types of funds such as the Exchange Traded Funds (ETFs).

Since this reform allowed several new types of funds to operate in the Egyptian market and facilitated and laid the regulatory framework for establishing these funds, the number of funds operating in Egypt increased significantly. This should have had the impact of improving the level of efficiency of the Egyptian market due to the size and trading of funds that rely on fundamental information rather than being noise traders. Hence, this reform measure should have increased the level of trading in the Egyptian market as the new regulation should have increased funds establishments and hence participation in the market, which should increase the level of trading and even add more to the quality of trading, as funds are managed by professional investors, rather than retail or individual investors.

4.3.1.4 Introducing pre-opening (discovery) session

The pre-opening session was a mechanism introduced with the new trading system X-stream adopted by The EGX in November 2008. This trading system developed by the American/Swedish Company Nasdaq-OMX, currently Nasdaq. The preopening session allows the commencement of the trading session on securities with a new opening price rather than considering the previous trading session's closing prices as the opening price.

This mechanism allows new information to be reflected quickly in security prices, prior to the opening session and hence reducing any autocorrelation in returns (predictability of returns) that might arise because of the opening price that is far from the perceived market price by investors.

Another important aspect of the preopening session that has a direct impact on liquidity is that should the new information be incorporated quickly in the opening prices, security prices during normal trading hours do not reach either the level of the circuit breaker or the price limits set for the day, and hence, trading halts are not activated. Accordingly, trading should be more continuous with the introduction of the preopening session and the activity of the market increased.

On the other hand, one of the draw backs of this mechanism is the high volatility induced in security prices. It could decline or increase by 20% with low volumes in the preopening session and then change by another ±20% during the normal trading hours and hence creating price changes by almost ±40% per day when the daily price limits of ±20% are imposed, and ±20% per day when daily price limits of ±10% are implemented.

It is worthy of mention that the pre-opening session has some conditions set by The EGX management to be met by investors to have a new opening price in place. According to EGX technology department, the criteria that brokers need to meet to calculate a new pre-opening price is as follows:

1) There are a number of distinct buy brokers (N) and distinct sell brokers (M) that need to participate on either side of the order book for the security being traded. This number is set to be a minimum of 5 distinct brokers on each side.

2) Crossing of the order book would result in at least (X) number of brokers participating in the pre-opening theoretical opening price calculation.

3) The minimum number of shares to be cross matched with this mechanism is 100 shares. This number varies based on the trading activity on the security being traded.

4) The minimum value to have a new pre-opening price calculated is EGP 30,000 per security. This number varies based on the trading activity on the security being traded.

Accordingly to the above, these criteria and limitations could limit the use of the discovery session by investors and hence the mechanism might not be used as frequently as envisaged, and accordingly, not much instances materialized whereby the pre-opening session enables investors to factor in the new information in the opening price, and hence the faster price corrections, lower autocorrelation, and higher efficiency per stock.

4.3.1.5 Online trading and omnibus accounts introduction

In May 2006, the Chairman of EFSA issued the Decree Number 50/2006 introducing and regulating for the first time in the Egyptian market online trading. This reform measure aimed at facilitating the trading activity conducted by investors and increasing the turnover and liquidity in the secondary market trading using this mechanism. It is worthy of

mention, that for this reform measure to take place, The EGX developed an amendment in the connectivity with brokerage companies to be based on what is known in the stock markets field as FIX protocol.

The FIX protocol is a messaging system that resembles SWIFT in its nature used in the banking system. The FIX messaging services developed by The EGX created a unified messaging scheme to receive buy or sell orders from stock brokerage firms channeled from their investors, and allows stock brokerage firms to link their back-office electronic order messaging systems with The EGX trading platform. Furthermore, it allows them to develop online trading platforms for investors to put their buy and sell orders on EGX's trading platform directly in what is called, straight through processing of orders (STP). In other words, the online platforms, enables brokerage firms to assess the investors financial position and capacity without any human intervention based on her information and his/her holdings of the different securities of stocks and bonds, and hence enabling investors to increase their speed of trading based on the new information published on the company, market, and economy as swiftly as desired. The expected impact of this reform is to improve the level of efficiency in the Egyptian stock market.

Furthermore, the Chairman of EFSA issued the Decree Number 53/2006 introducing and regulating the Omnibus Accounts trading mechanism. These are accounts that allow funds and portfolio managers to buy securities and then allocate the holdings of these securities for the investors or funds accounts at the end of the trading session without having to incorporate the details of the funds or investors prior to trading.

The Omnibus Accounts is considered a reform measure as the Egyptian stock market works on a beneficial owner model rather than registered owner model. In other words, whether retail or institutional investors who are trading securities on the exchange need to have a unified code for investment issued by the EGX. Then the investors use this unified code to buy or sell in the market. Accordingly, and asset manager managing funds for several individual or institutional investors, had to incorporate the unified code for every investor before execution. This was time consuming and deterred asset managers from trading in the market. With the Omnibus Accounts system, asset managers are allowed to trade using this account, and then segregate the bought shares or the sales proceeds at the end of the trading session.

Hence, this reform measure should have facilitated the process of trading by asset managers and should have had improved the levels of liquidity and efficiency of the Egyptian stock market.

4.3.2 Price Manipulation, Information Asymmetry Reduction and Transparency Reforms and Measures

This category of reforms aimed at reducing the information asymmetry among investors. Reducing the information asymmetry either by banning illegal activities, such as price manipulation and insider trading, or by increasing the amount of information available to investors, should reduce the return predictability of security prices as the information should be incorporated in the security price. This prediction could be either due to price

manipulation or by following the trading activity of insiders. And if the predictive ability of security prices decreases, it implies that security prices reflect all historical prices and disclosed and private information, and hence improve market efficiency. This category of reforms includes the following:

4.3.2.1 Setting the Regulatory Framework for Combating Price Manipulation and Insider Trading

The regulatory framework for combating price manipulation and insider trading has been set by adding Chapter 11 to the to the executive regulations of the Capital Market Law (CML) Number 95/1992, by the issuance of the Ministerial Decree Number 141/2006.

This chapter set the regulatory framework not only to penalize any individual that materialized undue profits due to the use of insider information, but also defined and strictly set the penalties for any price manipulation resulting from spreading rumors, putting fictitious buy or sell orders in the market and front running behavior. Additionally, this chapter formally introduced the definitions of associated groups, material information, insider trader…etc. that without them it was not legally possible to sanction any person conducting this illegal activity.

According to the above, the expected impact of this reform is to reduce price manipulation that arises from the pump-and-dump or trash-and-cash manipulative trading adopted by price manipulators, especially on illiquid stocks. Pump-and-dump manipulation is whereby an investor or group of investors keep trading the stock amongst themselves at

a higher price to entice other investors to participate and buy the stock. When this happens, the manipulating investors sell their stocks to the newly enticed investors at a higher price without having significant demand afterwards. The price collapses the moment the manipulating investor(s) ceases to trade the stock after selling them. The opposite happens for the trash-and-cash. This conduct usually takes more than one trading session to materialize. It happens over a number of days which creates a seemingly autocorrelation and return predictability, and hence a seemingly lower efficiency level.

Accordingly, combating this behavior should lessen the number of days security prices move in the same direction, either upwards or downwards and thus decrease the serial correlation in security returns and hence improve efficiency in its weak form. From a different perspective, combating insider trading implies that no specific person should be able to benefit from any undisclosed information and hence could simply assume that prices move in a random fashion rather than being induced by some insiders, based on their information available at hand.

The problem with testing the impact of this reform measure on efficiency is the dual testing problem. If a conclusion is reached that this reform measure had no positive impact on efficiency, it could be due to one of two reasons; that indeed this reform did not improve efficiency or that the implementation of this reform was not conducted properly and hence did not reach to the aimed target. It is worthy of mention, that this phenomenon will be

more common to small and medium sized firms that are illiquid rather than highly capitalized and liquid stocks.

For the impact of this reform to be tested statistically, the exact cases of manipulation should be retrieved from EFSA and EGX to analyze the efficiency of the particular stock before and after the identification of this behavior and penalizing the investors. However, the issue with this would be the secrecy of information that would not be possible to be shared or disclosed, and hence yield the entire exercise as unpublishable.

4.3.2.2 Tender Offers for Acquisition Regulations

In 2007, Ministerial Decree Number 12 was issued setting the first regulatory framework for tender offers for the purpose of acquisition, by adding a new chapter to the Executive Regulations of the CML. Prior to this decree, there was not any formal regulatory framework in the Egyptian market governing acquisitions.

The new decree stipulated all the requirements for any company to submit a tender offer to acquire a listed company at the EGX. The regulations stipulated that once the target company receives a formal indication from the acquiring company with its intention to acquire the target company, they should disclose it immediately to the EGX and EFSA. This formal indication could take any form, such as signing a memorandum of understanding with the acquiring company, a due diligence agreement, a negotiation agreement…etc. Additionally, the target company should disclose to the EGX and EFSA

any material information, should they notice a material change in the values and volumes in the trading of their own stocks, or if they suspect there is a leakage of information.

The newly issued regulations at that time set in place the level of ownership upon which the investors and board members need to disclose to both the EGX and EFSA with their ownership. For non-board members with 5% and its multiplier of ownership being bought through the open market, should send a disclosure to the EGX and EFSA with level of ownership in the company. For board members this ratio is 3% and its multipliers.

The regulations also put in place the thresholds where an investor should submit a mandatory tender offer for the remaining stocks in the market. If any investor acquires 33% of the voting rights of any company, he/she should submit a mandatory tender offer for the remaining stock in the market. Additionally, once the ratio reaches between 25% and 33%, he/she needs to submit a disclosure to the EGX and EFSA with his/her investment plans in the target company.

According to the above, the general theme of the regulation is to increase the levels of disclosure and reduce the level of information asymmetry. This should provide a chance for investors to incorporate this new information in security prices as quick as possible. This disclosure level should decrease the autocorrelation in stock return of the target companies, as with its repetition by investors with the multipliers of the threshold, prices should reflect this new information, and hence reduce autocorrelation of returns and improve market efficiency.

4.3.2.3 Issuing the Listing, Delisting, and Disclosure Rules

The issuance of the listing, delisting and disclosure rules in June 2002 with a grace period of one year is considered a key milestone in the development of the Egyptian capital markets. It set the grounds and the requirements for listing and delisting stocks at the stock exchange. Additionally, it set the disclosure requirements to be adopted by the listed companies to continue being listed in the Egyptian Exchange.

The listing and delisting rules include the minimum capital, profitability, and legal structure and requirements for any company to be listed in the exchange. These regulations were set in place to ensure a certain size and quality of the listed companies. The disclosure rules set the requirements for companies to continue to be listed. The disclosure rules set the timing, frequency and authentication of disclosures such as the disclosure of material events that could affect the future performance of the company positively or negatively. Additionally, the disclosure requirements set the timing for companies to disclose board meetings minutes to the public after authentication from both the General Authority for Free Zones and Investments (GAFI) and the Egyptian Financial Supervisory Authority (EFSA). Furthermore, it set the timing for companies to disclose to the public, via the EGX, the preliminary and audited financial statements, including the balance sheet and income statement.

Accordingly, one could easily argue that the adoption of the listing, delisting and disclosure rules in 2003 should improve the level of efficiency of the Egyptian market to a certain extent. This is especially true for the disclosure requirements. It is worthy of

mention, that testing for the effect of issuing the listing, delisting and disclosure rules is prone to the problem of the lack of the strict implementation of these rules. Having said that, this regulation should have the greatest impact on the well capitalized, active companies, as they rely on the stock market frequently to raise funds, via capital increases, and hence will abide by the rules, as much as possible.

4.3.3 Volatility Curbing Measures

Volatility curbing measures are measures implemented by stock markets aiming at reducing the levels of volatility in security prices. These measures could have an adverse impact on efficiency. This is because volatility curbing measures comprises prices control by introducing or tightening the price limits and circuit breakers, and in the Egyptian case was canceling the pre-opening session. The EGX experience offers a great opportunity as the EGX tinkered with the idea of volatility curbing measures since its reinvigoration in the early 1990s.

4.3.3.1 Pre-opening Session Cancellation

As mentioned previously, the pre-opening session was introduced in November 2008 with the new trading system at the EGX. However, after the 25 January 2011 revolution, the EGX decided to cease operating with the pre-opening session to curb volatility during this turbulent period. This provides an opportunity to study the effects of the preopening session on market efficiency. We expect that with the cancellation of the preopening session, the speed of information transmission into security prices would be much slower

and hence reduce the market efficiency. Having said that, it is important to reiterate the limitations that are put by the EGX on the use of the pre-opening session, and accordingly, despite that the cancellation of the pre-opening session, its use might not have been as frequent as it was planned for with its introduction.

4.3.3.2 Price Limits and Trading Halts

Before delving into the specifics of the Egyptian market, it would be beneficial to present what price limits and trading halts aim to do in stock markets.

1) Price limits are limits adopted by exchanges in a way that sets a maximum percentage that a security could rise or fall during a trading day. The aim of this measure is to reduce excessive price volatility and reduce price fluctuations, especially in times of crisis. The advocates of price limits claim that it protects less informed investors, especially during crisis whereby the information transmission mechanism is not working effectively.

2) Trading Halts are also measures adopted by exchanges, whereby trading is suspended on the stock once security prices changes by a certain percentage up or down. There are usually two price bands for trading halts. The first band or range is lower than the second and trading halts whenever stock prices change by the borders of this range for a predetermined period of time. The second band - which is larger than the first one - once reached, trading is suspended for the remaining of the trading

day. The aim of this measure is to curb volatility in stock prices, especially during the times of crisis.

Having mentioned the aim of price limits and trading halts, it is important to mention that they might be having adverse impacts on efficiency and market liquidity. The negative impact on efficiency comes from the reduced speed of incorporating information in prices. Hence, if new information comes to the market, and would require a move that is more than the price limits, it yields another move and in the same direction the next trading session and so on. This is repeated with every time material information comes to the market that requires a change with more than the price bands. In other words, it takes much longer to reach to the new equilibrium price for securities after the disclosure of a material piece of information and accordingly reduces the efficiency of the market. Its negative impact on liquidity in the market attributed to the trading suspension when the first and second price bands are reached. As for price limits, it affects liquidity in the sense that investors will not be willing to actively participate in the market, unless prices reach the new equilibrium price, and hence reduce the trading activity, until reaching the new equilibrium price.

The Egyptian case provides an opportunity for scholars to assess the impact of price limits and trading halts on the efficiency of the Egyptian market. This is mainly because price limits and trading halts have been introduced and changed several times, since the reinvigoration of the EGX in the early 1990s as presented below:

1) Initially, when the stock market was reinvigorated in the early 1990s, there were no price limits or trading halts in the market. Security prices were allowed to change according to market dynamics and prices were left to move freely.

2) However, in late February 1997, the EGX adopted the price limit measure to curb volatility in the Egyptian market. This was associated with the volatility induced by the Asian crisis. All stocks in EGX were subject to a price limit of ±5%. In other words, stocks were only allowed to move by up or down 5% compared to the previous day closing price which in itself is the opening price. It is worthy of mention that no bids were allowed outside this tight band of ±5%.

3) Since May 2002, the EGX started to combine price limits with circuit breakers for stocks that qualify for being active stocks. According to the circuit breakers, stock prices are allowed to move within a ±10% with no activation of the circuit breaker. Once price changes exceed the ±10% range, trading is suspended for 30 minutes. After that, if the stocks Volume Weighted Average Price *(VWAP - closing prices)* changes by more than ±20%, trading is suspended for the remaining of the trading session on this particular stock. During that period, investors could have put any order that goes beyond the ±20% thresholds as long as the VWAP did not reach the thresholds. We name this price limits and circuit breaker period as VWAP±20%.

4) During the aftermath of the financial crisis, in late October 2008, the EGX decided to change the basis upon which price limits and circuit breakers are implemented. Trading is suspended for 30 minutes, if security prices changes by more than ±10%, and there is a price limit of ±20% whereby no bids or asks were allowed

outside this band. So theoretically, investors are not allowed technically to put orders that reaches the price limit. Hence, we name this an order limit of ±20%.

5) After the 25 January Revolution, the EGX decided to further reduce the circuit breakers and the price limits to be ±5% and ±10% respectively based on the order price. Again, these measures were imposed to reduce the excessive volatility that might arise due to the revolution implications on the economy and companies operating in the Egyptian economy.

According to the above, there are five distinct phases that could have impacted the level of efficiency of the Egyptian market. As mentioned before, this is an opportunity for any scholar to assess the impact of price limits and trading halts on the level of evolving efficiency of the Egyptian stock market.

4.3.4 Market Breadth and Depth Reform Measures

This category of reforms aimed at increasing the number of well capitalized profitable companies - operating in various sectors - available to investors through the Egyptian stock market which increases the market breadth. Furthermore, this category of reforms aimed at increasing the market depth by setting a minimum free float requirement that the listed companies need to maintain to continue to be listed, and set as well as the minimum level of issuance size to ensure that there is enough securities available for trading, to maintain the level of liquidity for this stock in the market.

4.3.4.1 Partial floatation of Government Owned Enterprises (GOE)

To increase market breadth, part of the activation plan for the Egyptian stock market was to partially float profitable SOEs in 2005. The reform measures included the floatation of; 1) 20% of Sidi Kerir Petrochemicals Company (SKPC) in June 2005, 2) 20% of Alexandria for Mineral Oil Company (AMOC) in September 2005, and 3) 20% of Telecom Egypt in December 2005.

Indeed, these measures had a very strong impact on attracting new investors and increasing the level of liquidity in the market. Accordingly, this reform measure should have had a positive impact on efficiency, since the domino effect of liquidity to other stocks should have improved the level of efficiency of the Egyptian stock market. The following table presents the IPOs conducted during the implementation time of FSRPs and the amount of demand on these IPOs as evidenced by the amount of oversubscription of orders, SKPC's public offering was oversubscribed 2.6 times, AMOC's public offering was oversubscribed 26.56 times, and ETEL's public offering was oversubscribed 9.43 times despite of the sizable offering. Public offerings, and especially for SOEs, are considered an effective mechanism to attract new investors and add breadth to the market.

Table 4.3: IPOs Details of SKPC, AMOC and ETEL

Values in USD	IPO Date	Public Offering Value	Private Offering Value	Offering Value
SKPC	22-Jun-05	160,000,000	130,454,196	290,454,196
AMOC	27-Sep-05	69,187,500	91,619,625	160,807,125
ETEL	08-Dec-05	406,039,173	357,844,323	763,883,497
USD 1 =EGP 5.6				

Source: The EGX

4.3.4.2 Minimum free float and issuance size requirement

EFSA's board amended the Listing, Delisting and Disclosure rules, in September 2008, by issuing the Board Decree Number 94 for 2008, whereby it set the minimum free float level of 5% of the companies issued stocks, otherwise it would be delisted from the EGX. This reform measure aimed at increasing the market depth by ensuring there is a minimum percentage of stocks being freely traded in the market. Having this minimum is a necessary but not sufficient measure to reduce market manipulation in the less liquid stocks and increase the level of trading by increasing the demand of some institutional and high net worth individuals in these stocks.

According to the above, when the number of stocks available for trading increases in the market due to the minimum free float requirement and issuance size, market depth is improved and usually market depth increases the level of liquidity and hence improves the level of efficiency in any stock market.

4.4 Chapter Conclusion

This chapter presented the reforms and measures implemented within the FSRPs pertinent to the stock market in general and the reforms that are very specific to enhancing the trading environment at EGX. Some of the reform measures should be having a positive impact on efficiency and some other measures might result in a reduced efficiency. Not all reforms and measures could result in measurable variables, and hence incorporated in our statistical analysis

5. Data Collection and Variables Construction

5.1 Introduction

One of the main challenges related to estimating the time-varying efficiency of the Egyptian stock market was obtaining and developing the relevant data and information used as a proxy for reforms and measures to estimate the evolvement of the Egyptian stock market efficiency through time. This chapter will cover the data gathered, how they are organized and the choice and construction of the proxy variables.

Initially, it could have been assumed to use dummy variables that would take a value of one on the date of implementing each specific reform and zero otherwise. The drawback of this approach is the overlap in dates of reforms and measures implemented by market institutions and regulatory bodies. Accordingly, it would have been impossible from a statistical standpoint to segregate the effect of the different stock market reforms and measures without finding an alternate proxy to measure the impact of these reforms on the market, otherwise we would face the clear problem of multicollinearity.

Accordingly, we needed to determine first the proxy data required to reflect the reforms and measures through their proxy data. The second step was to collect the trading data on individual stocks and aggregate for the entire market to estimate the time varying beta for the entire market. Despite that a large number of the reforms and measures presented are market generic and impact all listed stocks, they require certain conditions to be met for the trading activity of stocks to be eligible to be traded using these new mechanisms.

Those particular stocks are the ones that are going to be assessed. Accordingly, we will describe the proxy variable to measure some of the abovementioned reforms in terms of market data and whether we relied on the dates of introduction of these reforms only, or we relied on the date in addition to some other quantitative measures.

It is worthy of mention that some of the reforms that have been implemented are not feasible to be assessed by obtaining quantitative data for these reforms. Accordingly, what is presented and described below are the set of proxy variables reflecting the quantifiable reforms or that can be incorporated in an econometric model to achieve our target of assessing the time-varying efficiency of the Egyptian stock market and the impact - if any - of the reforms on this time-varying efficiency. Furthermore, some variables are going to be incorporated in our step two econometric models due to their potential explanatory powers without being a proxy variable for the reforms and measures.

5.2 Proxy Variables for Overall Market Assessment (Index Level)

5.2.1 Financial Sector Reforms Dummy Variable

As mentioned previously, the FSRPs introduced and implemented reform measures targeting the banking and non-banking financial sector. The variable proxy for the entire program that would resemble the financial liberalization dates in other emerging economies would be a dummy variable that would take the value of zero before July 2004 and 1 afterwards. The variable should capture the impact of the reforms and measures

on the time-varying efficiency for Phase I and Phase II of the FSRPs. The date is chosen based on the announcement of commencement of implementing the FSRPs in Egypt. The variable would be named FSRP I II.

5.2.2 Periods of Instability Dummy Variable

The international financial crisis that erupted September 2008 put a dent on the reforms implementation pace, and following the financial crisis, Egypt witnessed two revolutions in January 2011 and June 2013 that could potentially had a negative impact on the overall efficiency of the Egyptian stock market. Accordingly, it is of importance to segregate the impact of this period from the general reforms that took place starting 2004. This segregation is conducted via constructing a dummy variable that takes a value of one between September 2008 and July 2014. Should the financial crisis and revolutions have a negative impact, this variable would be significant, and its estimated coefficient should positively correlated with the estimated time-varying coefficient.

5.2.3 Restored Stability (Reduced Instability) Dummy Variable

After 2014, Egypt witnessed significant measures towards restoring political and economic stability with having a new constitution, elected president and parliament. Add to that, in November 2016, the GoE entered into an agreement with the International Monetary Fund (IMF) to restore Egypt's macroeconomic balances and implemented aggressive measures to restore macroeconomic balance in the economy via reducing budget deficit with cutting energy subsidies and reducing balance of payments imbalance

via devaluating the domestic currency significantly to reflect economic conditions at that point of time. Having said that, Egypt's economy and capital markets were still going through the difficulties associated with the aftermath of the two revolutions. In order to segregate the impact of this period to assess whether the reforms contributed to improved efficiency, or contributed less to the deterioration of efficiency compared to the period before it, a dummy variable is constructed that takes the value of zero before July 2014 and one afterwards.

5.2.3.1 More On Dummy Variables

The importance of having the dummy variables as presented previously is to capture the different conditions that could have impacted the efficiency level as a whole such as the financial crisis, the two revolutions and the periods of relative stability. It is worthy of mention that the dummy variables are not perfectly overlapping and hence we do not witness perfect collinearity in our model. And even when we estimated the model while amending the dummy variables dates and values to reduce the possibility of witnessing this problem, model results did not change significantly. Segregating the dummy variables in such a manner that do not overlap at all, will not render capturing and segregating the overall impact of the different periods feasible, and the potential benefits of doing so did not outweigh the potential interpretational loss of having them as presented previously.

5.2.4 Other Proxy Variables

In this section, we will present how some of the variables that reflect the reforms and measures that could be proxied with a variable is constructed.

5.2.4.1 Same-day (intra-day) Trading

Settlement of trading in the Egyptian market is based on an actual cash settlement (share versus cash) as opposed to netting the transactions in advanced markets. Accordingly, with the intra-day trading reform measure, it was allowed for investors - on some stocks that matched the criteria of activity set by EGX - to buy and sell stocks on the same day. This should result in additional trading activity in the market, and accordingly improve market efficiency.

This reform measure has the benefit of being assessable via segregating all trades that were conducted on the exchange to be settled on the same day from trades settled via the normal trading cycle (T+2). To be able to do this, all trades on all eligible stocks traded with this mechanism were aggregated to derive a market aggregate for intra-day trading. To do this we needed to assess the shares sold with this mechanism and multiply by two as it would not have been possible to sell those shares unless the investor would have bought them first. Afterwards, this volume of trading (number of shares traded with this mechanism) is divided by the entire number of shares traded in the market for buyers and sellers. By doing that we calculated the percentage of trading during the day that took place using the intra-day trading mechanism. The variable will take the value of zero on the days that the reform was not introduced and the days whereby there was no trading using this mechanism.

Accordingly, the steps followed to identify and gather the proxy variable are as follows:

1) Collected the data on individual stocks that are or used to be eligible for trading with the intra-day trading mechanism.

2) Identified the exact dates of applying the intra-day trading mechanisms for individual stocks.

3) Segregated the trading activity in terms of volume and value conducted on these stocks using the intra-day trading mechanism and the normal settlement trading activity.

4) Aggregated value and volume of intra-day trading for all eligible stocks.

5) Divided the intra-day trading on the market trading volume to derive the percentage of trading using this mechanism.

6) Set the proxy variable to be the abovementioned percentage such that it takes a value of zero when the trading mechanism is not in place or present but without trading, and otherwise will be the abovementioned percentage. In other words, before the introduction of this mechanism or the stock(s) is/are not traded by this mechanism, the variable would have a value of zero, and if it is traded would have a certain numeric value equivalent to a certain percentage that is the intra-day volume of trading of the market divided by the entire volume of the market.

The intra-day percentage variable is then regressed - amongst other variables - against the estimated time-varying beta coefficient to assess how did this variable impact the efficiency level of the market.

5.2.4.2 Omnibus Trading Variable

To capture the impact of this reform measure, all Omnibus accounts are being identified and all trades conducted using these accounts are being separated from the normal trading that is not conducted without this mechanism. Afterwards, all of these trades are aggregated on the entire market to have a time series that would take a value of zero when this mechanism was not present (or no trades conducted with mechanism) and otherwise the value of traded securities using this mechanism. Afterwards, Omnibus trading value is divided by the total market trading value and the proxy variable is calculated, which is the percentage of Omnibus trading to total value of market trading. In summary, the following steps have been followed to obtain the proxy variable on the market level:

1) Identified the Omnibus trading accounts that commenced in 2005 after the introduction of this reform measure to improve trading. The identification resulted in 53 accounts with only 45 omnibus account trading in the market.

2) Extracted the trades conducted by those accounts in the market on a daily basis from the total trading of the market.

3) Aggregated these trades for all Omnibus accounts on a daily basis.

4) Divided the aggregated trades over the value of trading for the entire market.

5) Developed the variable representing the percentage of Omnibus trading to total trading of the market on a daily basis.

5.2.4.3 EGX30 Index Free Float Variable

This variable should be reflecting the reform pertinent the listing and delisting rules issuance that stipulated a minimum level of free float for listed companies. The definition of free float is the number of shares as a percent of total issued shares of the company that are available with investors. The investor should not own more than 10% of the company's shares to be considered within the free float. The rational behind this is that investors and their related parties owning more than 10% will usually - not surely though, be a strategic investor(s) and hence are not availing the shares for trading in the market. We used the EGX30 constituent companies free float for three reasons: 1) EGX does not have data gathered on free float before 2003 but for EGX30 constituent companies that goes back to January 1998; 2) constituent companies of EGX30 would represent not less than 70% of the entire market capitalization; and 3) we are estimating the time-varying efficiency based on EGX30 index returns, and hence use this variable as one of the independent variables trying to explain with it the variability in the time-varying efficiency parameter (beta). The steps undertaken to calculate this variable is as follows:

1) Identified the free float value of the individual stocks constituting the EGX30 index on the disclosed basis (quarterly).
2) Aggregated this free float value for those companies to come up with the free float of EGX30 index.

3) Divided this free float value on the market capitalization of EGX30 constituent companies to derive the free float percentage of the market proxy to be regressed against the time-varying beta

5.2.4.4 SKPC, AMOC and ETEL Privatization[6] Variables

The GoE re-activated the program of privatization with partially floating 20% of each of SKPC, AMOC and ETEL. The rational of incorporating these variables is that privatizations always adds more visibility and liquidity to the market and improves trading activity after the partial floatation of companies. Accordingly, it is important from a policy perspective to assess if these privatizations had an impact - if any - on the market time-varying efficiency. The following steps have been followed to derive the variable reflecting the privatization to regress it against the time-varying parameter:

1) Obtained the daily trading value of each of the partially floated company.

2) Dividing the daily trading value to total buying and selling market value for each company.

3) The time series ratio is developed for the three companies that reflect the percentage of trading for each stock in a trading day to total market value of trading.

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[6]Alexandria for Mineral Oil Company (AMOC), Sidi-kerer Petrochemicals Company (SKPC), Egypt Telecom (ETEL)

5.2.5 Proxy Variables Summary

The following table summarizes the variables pertinent to the market level analysis that is going to be conducted.

Table 5.1: Market Level Proxy Variables Summary

Market Level Proxy Variables Summary		
Name	Type/Description	Reform(s) Coverage / Reflection
FSRP I II	Dummy Variable; takes the value 0 before July 2004 and 1 afterwards.	The variable coefficient should reflect the impact of two phases of the financial sector reform program on the time-varying efficiency parameter
Instability	Dummy Variable; takes the value of 1 between September 2009 and June 2014, and 0 otherwise	The impact on efficiency due to the periods of instability because of the international financial crisis and the two revolutions Egypt witnessed in January 2011 and June 2013
Relative Stability	Dummy Variable: takes the value of 1 starting from July 2014 onwards and 0 otherwise	Aims at measuring impact on efficiency (either improving or of less negative impact compared to the Instability Variable) after the restoration of political stability and working on the restoration of macroeconomic stability commencing in November 2016.
Intra-day Trading	Numerical (statistical): takes the value of the percentage of trading based on T+0 settlement, and 0 otherwise for the entire market per day.	Aims at measuring the impact of the Liquidity Enhancement reform measure – if any – on the time varying efficiency of the entire market.
Omnibus Trading Variable	Numerical (statistical): takes the value of the percentage of value of trading conducted by the omnibus trading mechanism divided by total market traded value, and 0 otherwise for the entire market per day.	Aims at measuring the impact of the Liquidity Enhancement reform measure – if any – on the time varying efficiency of the entire market.
EGX30 Index Free Float Variable	Numerical (statistical): it's the ratio of the value of free floated shares to total value of shares for EGX30 constituent companies	Aims to assess the impact of the increased free float due to the issuance of the listing rules that mandated a minimum level of free float on the time-varying efficiency. Market Depth reform.
SKPC, AMOC & ETEL	Numerical (statistical): percentage representing the value of trading for each individual stock to market value traded	Aims to assess the impact of partial floatation (privatization) on market efficiency. Market Breadth reform.

Source: Researcher

5.3 Proxy Variables for Individual Stocks Assessment

This section will be presenting the variables that are going to be used to explain the variability of the time-varying efficiency of individual stocks that have been impacted – in one way or another - with the reform measures implemented during the two phases of the FSRPs. As mentioned in the reforms section, not all stocks are allowed to benefit from some of the reforms. For example, the stock should have a minimum level of liquidity to be allowed to be traded with margin trading, intra-day trading (T+0), or even be allowed to have wider price floors and ceilings.

The Egyptian Exchange publishes different categories of stocks that are eligible to different trading mechanisms and options. So basically, to conduct the analysis in this thesis, we identified which stocks that have been exposed or was eligible to at least one of the reforms that are pertinent to the stock market and chose it amongst the population of stocks to assess its time-varying efficiency. The following are the main statistics covering the choice of the stocks:

1) We obtained the number of traded securities since 1998 and it turned out to be almost 1026 securities. This number includes rights issues being traded in the market.

2) We have chosen the stocks that have been subject or incorporated in the list eligible for being traded using specialized activities. This turned out to be 275 stocks, out of which, only 223 were traded.

3) Furthermore, companies that were delisted prior to 2018, and companies that have been witnessing significant price manipulation cases as reported by the EGX without providing details, or not sufficiently traded that would affect the findings pertinent to the time-varying efficiency of individual stocks, have been eliminated from the list of stocks to be tested for the time-varying efficiency. This reduced the 223 eligible companies by 49 stocks.

4) Finally, the trading data of the 174 stocks have been collected since its first trading day to May 2019 should it be available.

5.3.1 Daily Returns Variable

To run the first step of assessing how the AR(1) coefficient varies across time, the daily returns calculation is being conducted. However to obtain the daily prices for each stock, all corporate actions including stock splits, capital increases with nominal value, stock dividends, reverse stock split had to be accounted for in the historical prices to obtain prices that are corrected for these corporate actions to calculate the returns unaffected with corporate actions. In simple words, we required for data that takes into account each corporate action for each stock across to obtain adjusted closing prices of each stock for the 174 stock, and obtained the daily returns afterwards. Returns are calculated based on the natural logarithmic differences of daily security prices.

5.3.2 ORDER±5% Price Limits Dummy Variable

As mentioned in the reforms section, post the Asian crisis in 1998, the Egyptian exchange and the regulator at that point of time (The Capital Market Authority) decided to limit price movements and daily changes to curb volatility by a daily maximum of up or down of 5% based on the trade price compared to the previous day close price. The intention was to slow down the price decline should it be the case. This continued to be the case for the entire market until starting from 2002, The EGX started to relax this ratio and started implementing a daily price limit of ±20% based on VWAP. This will be further explained below. In order to account for the impact of the ±5% price limit, we obtained the dates for each and every stock that was exposed to such limitation, and the dates that other price limits was implemented. This dummy variable takes the value of one if we have ±5% price limit, and zero otherwise. Having said that, this proxy variable is quite old dated and could be reflecting other conditions rather than the price limit desired to measure its impact.

5.3.3 VWAP ±20% Price Limits Dummy Variable

Starting from 2002, the stocks witnessing high trading activity have been allowed to move by ±20% based on VWAP. Volume Weighted Average Price is the average price of the stock weighted by the trading volume (number of stocks) per each transaction. The price limits are based on the intra-day VWAP compared to the previous session closing price. In other words, as long as the VWAP of the stock did not exceed ±20%, the trading system will accept the trade orders even if it is exceeding the price limits.

The proxy variable to reflect this measure is based on the dates whereby each stock (if any) is allowed to move by the VWAP ±20% price limit. The dummy variable would take the value of zero if this limit is not present and one if it is present.

5.3.4 ORDER±20% Price Limits Dummy Variable

With the financial crisis that started in September 2008, The EGX opted to implement the ±20% price limit on the *trade price* rather than the VWAP. In other words, even if the VWAP did not exceed the price limits ratio, the trade order beyond these limits would not be allowed to enter the trading system.

The proxy variable to reflect this measure is based on the dates whereby each stock (if any) is allowed to move by the ORDER±20% price limit. The dummy variable would take the value of zero if this limit is not present and one if it is present.

5.3.5 ORDER±10% Price Limits Dummy Variable

Starting from march 2011, when trading on The EGX was resumed after being closed for almost three months due to the aftermath of the revolution that took place end of January 2011, The EGX opted for reducing the price limits from ±20%, to ±10% based on the trading price of the stock to reduce and curb volatility, whether this improved efficiency or not, it would be assessed using the dummy variable that takes the value of 1 if this price limit is present and zero otherwise.

5.3.6 Free Float Percentage Variable

This variable reflects the number of stocks available for investors that are not considered strategic investors with an ownership of less than 10% in the company, divided by the total number of stocks issued by the company. As mentioned previously, theories imply that the bigger the percentage and the size of the company, the more efficiency trading on its stock should be. To obtain this variable, we obtained the number of stocks considered as free float, and divided this by the number of stocks issued by the company.

5.3.7 Intra-day Trading (T+0) Variable

This proxy variable represents the trading conducted using the same-day mechanism as a percentage of total trading on this particular stock in the market. The variable would take the value of zero if the trading mechanism was not introduced or there was no trading with this mechanism. It is worthy of mention that not all stocks are availed to be traded with this mechanism, and accordingly it will be mentioned in the analysis section whether this variable is present or not.

5.3.8 Egyptian Institutions Trading Variable

We obtained the trading of Egyptian institutional investors for each stock, and then divided this value of trading to total market trading. Market convictions is that institutions trading improves efficiency of the market and the stock as these are educated investors that trade based on fundamentals of companies. This proxy variable should reflect the collective

investment vehicles regulations that were issued in 2006 and could also induce reforms that facilitate trading and the presence of reforms pertinent to institutional traders in the Egyptian market.

5.3.9 Foreign Institutions Trading Variables

We obtained the trading of foreign institutional investors for each stock, and then divided this value of trading to total market trading. Market convictions is that institutions trading improves efficiency of the market and the stock as these are educated investors that trade based on fundamentals of companies and that foreign institutions would be enticed to trade in the stocks that are abiding by disclosure rules and are implementing proper governance rules in the listed companies. This proxy variable should reflect improvement in disclosures and governance due to the issuance of listing and delisting rules in 2002. Adding to that, this categorical variable, if found to be of a positive impact on efficiency, should be used as a guidance for reforms that should reassure foreign investors to increase their presence in the market.

5.3.10 Omni-bus Trading Proxy Variable

This variable is a proxy variable that should reflect the impact – if any – of introducing the omni-bus trading mechanism on each stock traded in the market. It is calculated based on segregating the trading of the omnibus accounts on each individual stock and then dividing this value by the entire trading value of the stock per day.

5.3.11 Discovery Session Proxy Variable

The final variable is a proxy variable that aims at quantifying the impact of introducing the discovery session to the trading of stocks. This variable is the stock price change that occurred during the discovery session. This reform measure should allow the price adjustment for any particular stock to be witnessed on the same day, and hence reduce any autocorrelations in the return series of the stocks. The main limitation of this proxy variable is that the frequency of witnessing a price change before the sessions on a daily basis is not that high, however, for relatively active stocks, this should be of a higher frequency. This variable will take the rate of change of the opening price of the stock if the opening session is activated and resulted in a new opening price, and will take the value of zero otherwise.

5.3.12 Variables Proxies Summary

The below table will be summarizing the variables used for the market and individual stock level proxy variables to assess the time-varying efficiency of the Egyptian stock market for individual stocks.

Table 5.2: Stock Level Proxy Variables Summary

Individual Stock Level Proxy Variables Summary		
Name	Type/Description	Reform(s) Coverage / Reflection
ORDER±5% Price Limits Dummy Variable	Dummy Variable: takes the value of 1 if the limit of ±5% is applied to this stock and 0 otherwise.	Variables reflecting volatility curbing measures. Used to assess the impact of the time-varying efficiency on the stock level. The target by policy makers is to reduce volatility, however, a byproduct or a result of this measure could be a reduced efficiency per stock as limiting price movements yields a longer time span for stocks to reflect the new information on a daily basis.
VWAP ±20% Price Limits Dummy Variable	Dummy Variable: takes the value of 1 if the limit of VWAP ±20% is applied to this stock and 0 otherwise.	
ORDER±20% Price Limits Dummy Variable	Dummy Variable: takes the value of 1 if the limit of TP±20% is applied to this stock and 0 otherwise	
ORDER±10% Price Limits Dummy Variable	Dummy Variable: takes the value of 1 if the limit of TP±10% is applied to this stock and 0 otherwise	
Free Float Percentage Variable	Numerical (statistical): it's the ratio of the value of free floated shares to total value of shares of the company on a daily basis	To be used in assessing the impact of the increased free float due to the issuance of the listing rules that mandated a minimum level of free float on the time-varying efficiency. Market Depth reform.
Intra-day Trading (T+0) Variable	Numerical (statistical): it's the ratio of traded shares on a T+0 basis, to total daily traded shares on a daily basis.	To be used in measuring the impact of the Liquidity Enhancement reform measure – if any – on the time varying efficiency of individual stocks.
Egyptian Institutions Trading Variable	Numerical (statistical): it's the ratio of the value of Egyptian institutions trading to total trading on the company's shares on a daily basis	To be used in measuring the impact of the Collective investment Vehicles Reform – if any – on the time-varying efficiency of individual stock.
Foreign Institutions Trading Variable	Numerical (statistical): it's the ratio of the value of foreign institutions trading to total trading on the company's shares on a daily basis	To reflect the impact of Liquidity and Market Depth reforms – if any – on the time-varying efficiency of individual stocks.
Omni-bus Trading	Numerical (statistical): it's the ratio of the value of traded shares with the omnibus mechanism to total traded value of shares of the company on a daily basis.	Aims at measuring the impact of the Liquidity Enhancement reform measure – if any – on the time varying efficiency of the entire market.
Discovery Session	Numerical (statistical): it's the percentage change in the stock price prior to the trading session and recording a new opening price for the stock.	Aims at measuring the impact of Quick Price Adjustment reform measure – if any – on the time varying efficiency of the entire market.

Source: Researcher and EGX several announcements and decrees

6. Time-varying Efficiency Estimation on the Market Level

6.1 Introduction

In this chapter we will derive the time-varying parameter for the market level – represented by EGX30 index - based on the random walk or AR(1) model as explained in Chapter (3). The estimation will be conducted using the Kalman Filtering technique in a state space formulation as aforementioned. To verify the relevance of the time-varying parameter, a deterministic model to estimate the stationary efficiency parameter to identify the magnitude of the parameter and how far it is different than the structural time series model using the Kalman Filter as a mean of verification of the results. However, before implementing the statistical analysis, it would be important to stipulate why EGX30 index is used for the analysis.

6.2 Why EGX30?

The EGX30 index constitutes the largest and most actively traded stocks. The market capitalization of companies (size of companies) constituting the index represent almost 80% of the entire Egyptian stock market capitalization. We could summarize the reason behind the choice of EGX30 as the market representation for the entire market as follows:

1) Constituent companies represent the largest and most active stocks listed on The EGX.

2) The index is an adjusted market capitalization weighted index, that puts more weight on the largest companies adjusted by the free float compared to other companies with a small free float. In other words, companies with the largest free float, should be having a higher weight compared to other companies with the same size and liquidity.

3) Broad representation of domestic institutional and retail investors, in addition to significant participation by international investors in the trading of companies' shares constituting the index.

4) All companies' corporate actions are adjusted in the daily calculations of the index.

5) EGX30 is one of the oldest indices issued by The EGX and goes back to 1998 which enables researchers to conduct a longer analysis of the performance of the market on a time series basis.

6) The index methodology has been well developed and is stable in terms of ranking of companies constituting the index.

7) The index is widely accepted amongst all investors and is considered the main market index representing the market.

Accordingly, because of the above reasons, EGX30 is considered to be the market proxy variable and is being used as the market proxy variable to estimate the time-varying efficiency.

6.3 Estimation Model and Variables

6.3.1 Estimation Model

The model to be used is the one described in the research methodology using Kalman Filters in estimating the time-varying efficiency coefficient presented in the AR(1) model. The AR(1) model is reproduced for presentation purposes as follows:

$$R_t = \beta_{0,t} + \beta_{1,t} R_{t-1} + \varepsilon_t \quad \varepsilon_t \sim N(0,1)$$

and the data generation function for $\beta_{1,t}$ is based on the following equation

$$\beta_{i,t} = \beta_{i,t-1} + v_{i,t} \quad v_{i,t} \sim N(0, \sigma_i^2); \ i = 0,1$$

Whereby, R_t and R_{t-1} are the daily change of EGX30 index at time t and $t-1$, and $\beta_{1,t}$ is the estimated time-varying parameter reflecting how much previous or materialized returns predict future returns. After estimating the time-varying parameter of the AR(1) model, the estimates are run against some variables that represent the reforms at large and some other proxy variables that reflect specific reforms that ultimately should have an impact on the evolving efficiency. The following equation is estimated:

$$\beta_{1,t} = Constant + \lambda_1 FSRP \ I \ II + \lambda_2 Insta\_D + \lambda_3 RS\_D + \lambda_4 \ Intra + \lambda_5 INSTIT + \lambda_6 Omni$$
$$+ \lambda_7 AMOC + \lambda_8 SKPC + \lambda_9 ETEL + \lambda_{10} FF + \varepsilon_t$$

Whereby, the variables used in the previous model are going to be presented in the following section.

6.3.2 Model Variables

Despite that the characteristic of stock market research is the relative availability of data, however, assessing specific reforms and developing and assuming its variable proxies is relatively challenging due to the access of data from the one hand, and the re-calculation of the trading variables to account for the specific reform. The following are the variables incorporated in the model. The detailed description of the variables are presented in Chapter Six.

1) *FSRP I II* is the dummy variable described previously that captures the effect of the implementation of Phase I and II of the FSRP and takes the value of 0 before July 2004 and 1 afterwards. This variable captures the impact of the reforms that could not be quantified in specific variables. The data set spans from 1998, when EGX30 was issued until May 2019. Depending on the initial sign of the time-varying parameter, the sign and magnitude of this variable would explain the impact of the FSRPs on the time-varying efficiency of the stock market.

2) *Insta_D* is a dummy variable that takes the value of 1 between September 2008 and June 2014 which is the period of witnessing instability commencing with the international financial crisis and the two revolutions witnessed in Egypt in January

2011 and June 2013, and zero otherwise. The sign and size of the parameter of this variable in the estimation model, compared to the sign, size and significance of the time-varying efficiency parameter estimated based on the AR(1) model, should indicate if this period of instability had any negative impact on the time-varying efficiency level of the market.

3) RS_D is a dummy variable that takes the value of 1 commencing July 2014 and zero otherwise reflecting the continued impact of the instability of the previous period but to assess if the impact of instability has changed because of the relative political stability witnessed at that period and the partial restoration of the macroeconomic fundamentals.

4) $Intra$ is the percentage of the volume of stocks traded using the intra-day trading mechanism to total value of stocks traded. The intra-day trading mechanism allows investors to buy and sell shares on the same day instead of waiting for the settlement cycle at T+2. The cycle T+2 implies that the investor who bought the stocks at time zero, will not be able to sell the bought shares but at time 2. The theoretical priori implies that same day trading should improve the stock market efficiency. This variable takes the value of zero when there is no trading with this mechanism and otherwise the aforementioned percentage. This is a liquidity enhancement reform.

5) $INSTIT$, is the percentage of institutional trading to total value traded for the entire market. This should capture the reforms pertinent to the collective investment vehicle reforms that took place in Egypt.

6) $Omni$, is percentage of the value traded using Omnibus accounts to total value of trading. This variable will take the value of zero when there is no trading with this mechanism either because the mechanism was not introduced or investors opted not to trade with it. This is a liquidity enhancement reform.

7) $AMOC, SKPC\ and\ ETEL,$ are the value of traded shares of the newly initially public offered companies (IPOs) at that point of time as a per cent of total market value trading. This is a market breadth and depth reform.

8) FF, is the variable reflecting the free float percent of the market and is the percentage of the value of EGX30 constituents free float to the market capitalization of the constituent companies. This variable should have increased after the issuance of the listing and delisting rules that mandated that companies must have a minimum free float available to investors to induce trading on the stocks. This is a market breadth and depth reform.

It is worthy of mention that not all market specific reforms can be represented in proxy variables. Accordingly, the impact of the reforms regarding the banking, insurance,

mortgage finance, and other capital markets reforms should be reflected and captured in the first dummy variable.

6.4 Model Results

6.4.1 Step One: Time-varying Efficiency Parameter

Conducting the Kalman Filtering on the AR(1) model resulted in the following estimates for the time-varying estimates for the beta coefficient that are statistically significant at all levels of significance.

Chart 6.1: Time-varying Coefficient Estimates (beta)
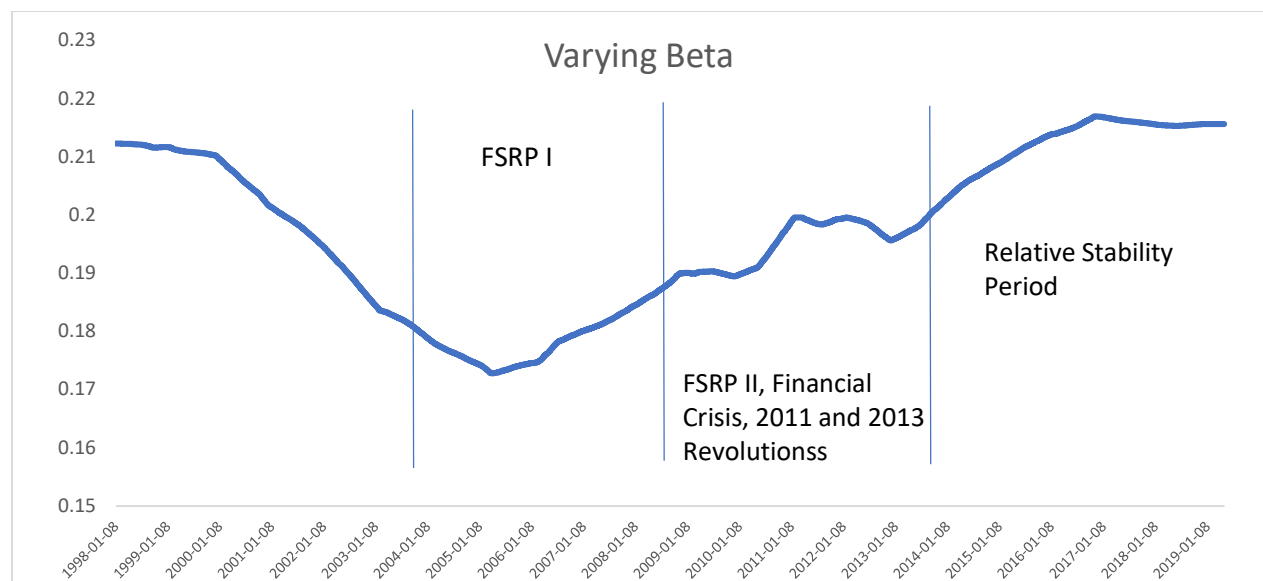
Source: Researcher

As can be inferred from the previous graph, the time-varying beta estimated from the AR(1) model showed variability across time. It started with a statistically significant value of 0.215636716 in January 1998 implying that tomorrow's returns are dependent on

today's returns on average, which defies the EMH which implies that this coefficient should be statistically indifferent than 0. Having a significant value implies that the market at large witnesses some level of inefficiency because of the predictability of daily returns. The time-varying parameter reached to its lowest level on 11 April 2005 with a value of 0.172794071. However, the level of efficiency declined gradually as time elapsed. This visual analysis could be contradicting to the initial believe that efficiency should have improved with the implementation of the FSRP without any future deterioration. Having said that, this deterioration could be understandable for the periods post 2008, however, the gradual deterioration, albeit being very small, commenced from May 2005.

A graphical representation of both EGX30 and the varying beta could give us some more insights before delving into the formal estimation of the impact of the explanatory variables on the time-varying parameter.

Chart 6.2: Time-varying Coefficient and EGX30 Index
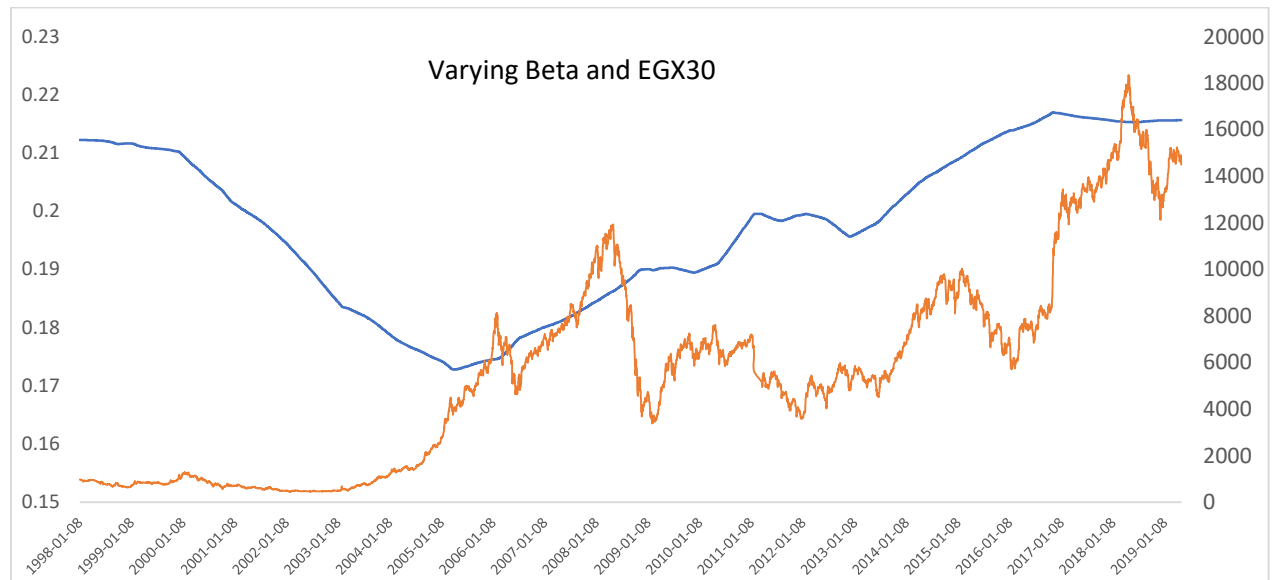
Source: The EGX and Researcher

The market witnesses period of long trends such as the years 2003-2008 with some price corrections in the middle. It could be the case that with trending periods the AR component gets stronger, and with sideways or declining periods the AR parameter gets weaker. Another possible explanation is the lack of presence of Short Selling mechanisms that could support the speed of price correction and adjustment in periods of upward trending. More formal testing regarding the explanatory variables will be conducted by running the second regression model with the estimated beta as the dependent variable, and the other explanatory variables as the independent ones.

6.4.1.1 Verification Using a Deterministic Model

An important step that was conducted in this thesis was to verify the non-time varying estimate of beta as a verification to the estimates regarding the absolute value of the time-varying parameter. That would be the long-term average value of efficiency. We run a

GARCH (1,1) model with the explanatory variable being the lagged returns of order one. We opted for using a GARCH (1,1) to correct for any heteroscedasticity that might be present in the error component of the model. The coefficient of the lagged return turned out to be 0.214731 and is significant at the 1%, 5% and 10% levels of significance. This is very close to the initial and terminal estimates of the time varying parameter. This approach was used to verify the results of the structural time series model using Kalman filters.

6.4.2 Step Two: Determinants of the Time-varying Efficiency Parameter

The second implemented step was to run a regression model with the time-varying parameter as the dependent variable and the above-mentioned explanatory variables to determine if the FSRP per se and the other proxy variables had any explanatory powers to the changes and variability in the estimate time-varying efficiency parameter. The model outcome is presented in the below table.

It is worthy of mention that for the variables to have a positive effect on the estimated time varying efficiency parameter, it has to be negatively correlated with the efficiency parameter. In other words, the variables coefficients should be of a negative sign. If the outcome of the variable coefficient sign is positive, its an indication of a worsening efficiency relationship between the explanatory variable and the dependent variable which is in our case the estimated time varying efficiency parameter.

Table 6.1: Step 2 Model Outcomes for the market level time-varying beta

VARIABLE	COEFFICIENT	STD.ERROR	T-VALUE	T-PROB	PART.R^2
CONSTANT	0.214515	0.0008179	262	0.0000	0.9298
FSRP I II	-0.0122487	0.0003662	-33.4	0.0000	0.1773
INSTA_D	0.0168122	0.0003305	50.9	0.0000	0.3326
RS_D	0.0370947	0.0003788	97.9	0.0000	0.6488
INTRA	-0.00786069	0.00209	-3.76	0.0002	0.0027
INSTIT	0.0146889	0.000825	17.8	0.0000	0.0575
OMNI	-0.0263664	0.009452	-2.79	0.0053	0.0015
SKPC	0.0219726	0.009162	2.4	0.0165	0.0011
AMOC	0.01577	0.01241	1.27	0.2038	0.0003
ETEL	-0.0321953	0.00786	-4.1	0.0000	0.0032
FF	-0.0632573	0.002061	-30.7	0.0000	0.1536

Source: Statistical outcome conducted by researcher

6.4.2.1 Interpretation of Results

The regression model regressing the proxy variables against the estimated time-varying efficiency parameter showed that the time varying efficiency effectively improved with the implementation of the FSRP I and FSRP II. The coefficient of the variable *FSRP I II* has a negative value and is significant as per the witnessed t-probability, indicating that the level of efficiency - as evidenced - has improved and that the presence of the FSRP excluding other measurable proxy variables improved efficiency. In other words, without implementing the FSRP I and II, the return predictability would have been persistent without any improvement. It is worthy of mention that both coefficients for the other two dummy variables covering the instability period and relative stability, turned out to be positive and indeed, led to the deterioration of the overall market efficiency. This indicates that those periods of instability led to significant deterioration in the time varying market efficiency that reduced the improvement resulting from the unobservable components of

the FSRPs. This is specifically true when analyzed from the path of the time varying efficiency coefficient assessed on the market level.

On the other hand, same-day trading variable coefficient was significant and had a negative sign implying that the additional trading resulting from the introduction of this mechanism improved the overall market efficiency. However, institutional trading reduces market efficiency as the variable's sign was positive and statistically significant at the 1%, 5% and 10% significance levels. One possible explanation is that institutional trading coincides with the general trend of the market prices, and hence it could be perceived that institutional trading leads to a decline in the overall market efficiency.

Two of the privatized companies' variables signs are positive, one of them is statistically insignificant and the other one is only significant at the 5% and 10% significance levels, indicating that these led to a deterioration of the overall market efficiency. A possible explanation is that AMOC and SKPC were the first two partially privatized companies and coincided with the trending period between 2004 and 2005. ETEL on the other hand, seemed to have improved the market efficiency as the proxy variable sign is statistically significant and with a negative sign implying that the partial privatization of ETEL improved the overall market efficiency as it was the third company to be privatized and created significant traction by domestic and international investors. Two possible explanations for this statistical finding; the first is that ETEL offering coincided with a market correction and hence the trending aspect of prices was not present; the second possible explanation is the size of the issuance of ETEL compared to AMOC and SKPC.

ETEL's offering was much larger with a significant retails investors component and hence could have had the desired impact on market efficiency. The statistically significant findings imply that the trading generated on ETEL reduced the returns predictability of the entire market. Table (5.2) is reproduced to showcase the size of issuance.

Table 6.2: IPOs Details of SKPC, AMOC and ETEL

Values in USD	IPO Date	Public Offering Value	Private Offering Value	Offering Value
SKPC	22-Jun-05	160,000,000	130,454,196	290,454,196
AMOC	27-Sep-05	69,187,500	91,619,625	160,807,125
ETEL	08-Dec-05	406,039,173	357,844,323	763,883,497
USD 1 =EGP 5.6				

Source: The EGX

A third possible explanation of why ETEL improved the estimated time varying efficiency is that the sheer size of the public offering, attracted funds from other stocks trading, and led to breaking the price momentum (potentially stock price bubble) and hence a market correction that reduced the return predictability.

Last but not least, one of the important significant variables on the level of efficiency of the market is the overall free float percent of the market. The sign of this variable is significant, with the right sign (negative) with a sizable magnitude. The magnitude comparison will be conducted in Chapter Nine after standardizing the coefficients of the estimated variables to control for the differences in measurement. This indicates that on the aggregate market level, the free float of the entire market is one of the important variables that improves market efficiency.

Table 6.3: Summary of Findings on the Time-varying Efficiency on the Market Level

VARIABLE	COEFFICIENT	SIGN	SIGNIFICANCE	IMPACT ON EFFICIENCY	CONFORMS WITH THEORY/ ATHEORETICAL PRIORI
CONSTANT	0.214515	+ve	Significant	Irrelevant	N/R
FSRP I II	-0.0122487	-ve	Significant	Improved	Yes
INSTA_D	0.0168122	+ve	Significant	Deteriorated	Yes
RS_D	0.0370947	+ve	Significant	Deteriorated	No
INTRA	-0.00786069	-ve	Significant	Improved	Yes
INSTIT	0.0146889	+ve	Significant	Deteriorated	No
OMNI	-0.0263664	-ve	Significant	Improved	Yes
SKPC	0.0219726	+ve	Insignificant	Deteriorated	No
AMOC	0.0157700	+ve	Insignificant	Deteriorated	No
ETEL	-0.0321953	-ve	Significant	Improved	Yes
FF	-0.0632573	-ve	Significant	Improved	Yes

Source: Researcher

6.5 Chapter Conclusion

This chapter presented the variables to assess the time-varying efficiency for the Egyptian stock market at large as assessed by EGX30 index returns using state-space models, and the impact of the reform proxy variables on this time-varying efficiency parameter. Ten variables have been used, out of which seven resulted in parameters that conform with the previously assessed theories and conclusions, and three do not conform, however one of them was statistically insignificant.

Overall, the coefficient of the variable reflecting the implementation of the financial sector reform program was significant and had the right sign reflecting that it indeed improved the level of efficiency, having the periods of financial crisis and the two revolutions outweighed the efficiency gains because of the FSRPs. Having said that, it is important to note that this variable reflects only the unobservable components of the reforms. In

other words, this variable reflects only the reforms and measures that could not be quantified using some proxy variables as the ones used in step two of the estimation such the reforms pertinent to the banking, insurance and mortgage finance sectors.

One of the most important reforms, is the market depth reforms as proxied by the free float percentage of listed companies as it improved the level of efficiency. Another important observable reform proxy variable is a market breadth reform represented by the partial offering of Egypt Telecom.

Finally, what can be concluded is that the FSRP and its associated measures improved efficiency of the entire market as evidenced by the parameters after excluding the insignificant ones. Periods of economic and political instability had a negative impact on market efficiency as originally expected.

7. Time-varying Efficiency on Stock Level

7.1 Introduction

In this chapter we aim at testing the impact of implementing the FSRPs on the stock level. The stocks chosen for testing, were the stocks that were impacted with at least one reform measure. Other stocks that have not been impacted with at least one of the reform measures were not included in the analysis.

7.2 Estimation Model and Variables

7.2.1 Estimation Model

The model to be used is the one described in the research methodology that is using Kalman filters in estimating the time-varying efficiency coefficient presented in the AR(1) model. It is the same model implemented for testing the overall market efficiency implemented in Chapter Seven. The AR(1) model is reproduced for presentation purposes as follows:

$$R_t = \beta_{0,t} + \beta_{1,t} R_{t-1} + \varepsilon_t \quad \varepsilon_t \sim N(0,1)$$

and the data generation function for $\beta_{1,t}$ is based on the following equation

$$\beta_{i,t} = \beta_{i,t-1} + v_{i,t} \quad v_{i,t} \sim N(0, \sigma_i^2); \; i = 0,1$$

Whereby, R_t and R_{t-1} are the returns at time t and $t-1$ for each stock of the 174 chosen stocks, and $\beta_{1,t}$ is the estimated time-varying parameter reflecting how much previous or materialized returns predict future returns. After estimating the time-varying parameter of

the AR(1) model, the estimates are run against some proxy variables that reflect specific reforms that could have had an impact on the evolving efficiency. The following equation is estimated:

$$\beta_{1,t} = Constant + \lambda_1 FF + \lambda_2 PER5 + \lambda_3 VWAP20 + \lambda_4 ORDER20 + \lambda_5 ORDER10$$
$$+ \lambda_6 DS_{TOP} + \lambda_7 Retail_{EG} + \lambda_8 Retail_{FOR} + \lambda_9 INST_{EG} + \lambda_{10} INST_{FOR} + \lambda_{11} SD$$
$$+ \lambda_{12} FIX + \lambda_{13} NOFIX + \lambda_{14} Omni + \varepsilon_t$$

The variables used in the previous model are going to be presented in the following section.

7.2.2 Model Variables

$\beta_{1,t}$: It is the estimated time-varying efficiency parameter derived from the AR(1) model estimated in step 1. Having a discernible pattern is of importance for implementing Step 2 of the estimation.

$Constant$: this is the intercept of the regression equation and reflects the beta value if all other explanatory variables are not present or have a value of zero. It is the starting point to assess how the other variables impact the intercept or the value of this constant should they be of significant explanatory powers to the variability of the time-varying coefficient.

$PER5$: Is a dummy variable taking the value of 1 when the price limits are based on orders percentage deviation from the opening price not exceeding ±5% and 0 otherwise. It is worthy of mention that some stocks are listed post the abolishment of this ratio and hence it would not be relevant for those particular stocks.

$VWAP20$: Is a dummy variable taking the value of 1 when the price limits are based on that price change per stock compared to its closing price (VWAP) does not exceed ±20% and 0 otherwise. It is worthy of mention that some stocks are listed post the abolishment of this ratio and hence it would not be relevant for those particular stocks. The adopted methodology that was abolished across the market in late 2008 after the financial crisis, allowed prices to move freely during the trading session as trading would not have been halted, and orders would have been accepted, unless the VWAP price exceeded ±20%.

$ORDER20$: Is a dummy variable taking the value of 1 when the price limits are based on orders percentage deviation from the opening price not exceeding ±20% and 0 otherwise. This was implemented starting from late 2008 after the eruption of the international financial crisis.

$ORDER10$: Is a dummy variable taking the value of 1 when the price limits are based on orders percentage deviation from the opening price not exceeding ±10% and 0 otherwise. This was implemented starting from March 2011 after the January 2011 revolution and it has been like this onwards.

DS_{TOP}: This is the price change occurring due to the implementation of the preopening session. It is called the Theoretical Opening Price (TOP). So accordingly, if the TOP is materialized, implying that the actual opening price is different than the closing price of the stock and hence this price change is calculated and regressed against the time-varying beta.

$Retail_{EG}$: It is the ratio of the Egyptian retail investors value of trading to total trading value for each stock.

$Retail_{FOR}$: It is the ratio of the Foreign retail investors value of trading to total trading value for each stock.

$INST_{EG}$: It is the ratio of Egyptian institutional investors value of trading to total trading value for each stock.

$INST_{FOR}$: It is the ratio of Foreign institutional investors value of trading to total trading value for each stock.

SD: it is the ratio of same day trading value to total value trading on the entire stock per stock.

FIX: it is the ratio of value traded on security using the online (electronic) trading to total value traded per stock.

$NOFIX$: it is the ratio of value traded on security using the traditional non-electronic trading to total value traded per stock.

$Omni$: it is the ratio of the value of trading conducted using the Omnibus accounts system to total volume of trading per stock.

7.2.3 Variables and Individual Stocks

Before presenting the outcomes of the econometric analysis, it would be of importance to shed the light on the eligible stocks for the analysis and its relation to the proxy variables. In this section, we will present some aggregates pertinent to the relevance of the proxy variables as some of the eligible stocks were not listed on the stock exchange the cancellation of 5% and accordingly the variable is expected not to yield statistical results. Furthermore, some stocks did not witness any trading using omni-bus trading mechanism or did not witness any discovery sessions theoretical opening prices, and hence, these variables could be irrelevant also and will not yield any explanatory powers over the time-varying efficiency parameter using the AR(1) modelling using Kalman filters. According to the above, the categorization will be presented to deduce which variables might not have any explanatory powers in the individual stock's regression models.

Furthermore, despite that whatever the trading mechanism or facility that has been introduced, it does mean that it has been used as frequently as desired by the entire

market, accordingly, we assumed that a minimum number of observations to expect any explanatory powers on the time-varying efficiency parameter to be 30 observations, otherwise, the variable might not have any statistical results, or its variable might not have any statistical significance even if yielded statistical results as an outcome from the second regression model. So, for example, the variable proxy DS_TOP is expected not have any explanatory powers in the estimation model unless; 1) the mechanism was present, and 2) used by investors for at least 30 trading session to have any explanatory powers as a proxy variable in the estimation model. Below we will present the 7 categories of stocks after identifying the variables that might have no statistical results from the first instance or have insignificant results as an outcome of the second regression model.

Details of the different stock models with the variables with expected no explanatory powers in the regression models for each category of stocks and the number of models associated with the variable are presented in Annex (1).

7.2.3.1 Category A

This category comprises 41 companies' stocks and no expectations for variables to be removed from the analysis, or that the regression models would not yield statistical outcomes pertinent to those variables even if not significant. It is worthy of mention that even if the number of observations is small, it is the dynamics, interlinkages and impact on the explanatory variable that would decide on the variable's significance and impact.

7.2.3.2 Category B

This category comprises 45 companies' stocks and 1 variable is expected not to have much explanatory powers or impact either because it was inapplicable, or the number of observations for this variable are below the minimum threshold of 30 observations. Annex (1) summarizes the variables that are expected not to have any explanatory powers for each subset of stocks. The variable that mostly is not present in this category is VWAP20 (23 stock models) followed by the Omnibus (7 stock models).

7.2.3.3 Category C

This category comprises 33 companies' stocks and 2 variables are expected not to have much explanatory powers in the regression models either because it was inapplicable, or the number of observations for this variable are below the minimum threshold of 30 observations. The first combination would be the VWAP20 and Omnibus with 22 and 16 individual stock models with expected no results for those variables, respectively.

7.2.3.4 Category D

This category comprises 17 companies' stocks and 3 variables are expected not to have much explanatory powers in some regression models because it was inapplicable, or the number of observations for this variable are below the minimum threshold of 30 observations. The variable VWAP20 is expected not to have any explanatory powers in 14 regression models, while the Omnibus variable in 10.

7.2.3.5 Category E

This category comprises 22 companies' stocks and 4 variables are expected not to have much explanatory powers in some regression models because it was inapplicable, or the number of observations for this variable are below the minimum threshold of 30 observations.

7.2.3.6 Category F

This category comprises 11 companies' stocks and 5 variables are expected not to have much explanatory powers in some regression models because it was inapplicable, or the number of observations for this variable are below the minimum threshold of 30 observations.

7.2.3.7 Category G

This category comprises 6 companies' stocks and 6 variables are expected not to have much explanatory powers in some regression models because it was inapplicable, or the number of observations for this variable are below the minimum threshold of 30 observations.

7.2.4 Estimation Outcomes

In this section we will be presenting the models outcomes for each category of chosen stocks. The first step would be to estimate the time-varying beta per stock using daily returns. The second step would be to run the regression model using the estimated time-

varying efficiency parameter as the independent variable and the other variables as explanatory variables, conclusion of the outcomes is going to be presented to assess the impact of those variables – if any – on the time-varying AR (1) parameter estimated in the first econometric model.

In the following subsections we will presenting the outcomes of each category of stocks in respect to the variables that showed explanatory powers to the variability of the estimated time-varying AR(1) parameter reflecting the evolving efficiency (time-varying efficiency) and to what extent the daily returns predictability for single stocks as evidenced from the estimated time-varying efficiency parameter, and that these explanatory powers were statistically significant. It is worthy of mention that some variables had no explanatory powers to the variability of the estimated time-varying AR(1) parameter. Furthermore, the direction of the impact will be reported to reflect whether the reform proxy variable – given it was significant – had a positive or a negative impact on efficiency and whether this conforms with the conceptual and theoretical hypothesis pertinent to these variables. This analysis will be presented on an individual variable basis and the details per each category is presented in Annex (2), however, the variable summary of results are presented on an aggregated basis in the below.

7.2.4.1 Discovery Sessions (DS_TOP)

DS_TOP Results Interpretations and Conclusions

In this analysis, 174 company stocks regressions have been considered, out of which 3 did not yield statistical results for this variable, 127 yielded insignificant variable

coefficients and hence cannot be accounted for when assessing if this variable improved the time-varying efficiency estimate or not. Out of the 44 models yielding significant results, 12 only resulted in a variable coefficient with the right sign with 27% of the outcome, and the remaining 32 models resulted in the wrong sign.

Table 7.1: DS_TOP Variable Models Outcomes Summary

Category	A	B	C	D	E	F	G
Available Stocks	41	45	33	17	22	11	5
Models With Statistical Results	41	45	33	17	19	11	5
Models Without Statistical Results	0	0	0	0	3	0	0
Variable Coefficient Significant at 1%, 5%, and 10%	4	2	7	2	5	1	2
Variable Coefficient Significant 5%, and 10%	0	3	1	3	2	2	2
Variable Coefficient Significant at 10%	3	1	0	1	1	2	0
Insignificant Models	34	39	25	11	11	6	1

Source: Researcher

Table 7.2: DS_TOP Variable Significant Results Summary

	Positive Impact	Negative Impact	Total Number of Models
Number	12	32	44
Percentage	27%	73%	100%

Source: Researcher

From all above results, it can be inferred that this reform proxy variable had no impact on improving particular stocks efficiency given the lack of significance for most of the models.

Having said that, this inference is not reflective enough given that there is not sufficient observations due to the limitations on trading with this mechanism. In other words, despite having the possibility of having pre-opening session trades to determine a new opening or reference price that takes the overnight information on stocks, the limitations put on this mechanism by EGX is hindering the price correction and calculation of new reference price used for calculating daily returns, and hence still observing correlations of daily returns that are not rectified by the discovery session.

Another possible explanation is that stocks that witness a TOP, usually have significant information on them, and with the presence of price limits of 20% or 10%, the price continues in its upward or downward direction for several days despite having the discovery session set in place resulting in autocorrelations of returns given that the allowed daily movement does not allow for the price correction to happen on that day, resulting in a statistical results that the presence of the omnibus mechanism led to a deterioration in efficiency rather than the opposite.

According to all the above, it could be deduced that the findings pertinent to this reform measure is inconclusive and effectively cannot be measured while having the limitations put of the discovery session set by The EGX. Last but not least, the closest variable measuring the impact of free price movements on stocks is the VWAP20. Accordingly, we will present the findings regarding this variable for the different model as it is conceptually close to the impact of the discovery session reform.

7.2.4.2 VWAP20

VWAP20 Results Interpretations and Conclusions

The variable VWAP20 was one of the variables that were implemented starting 2002 until 2008 as an attempt by The EGX management at that time to improve market efficiency and allow investors to price stocks and for company specific information to be reflected swiftly in the price of the stocks on the same day and hence improve market efficiency. The perceived drawback of this reform measure that given that the circuit breakers are being implemented on the VWAP price and not the order price, the market could witness significant volatility levels that is being perceived by market participants as detrimental to the market.

Testing the impact of this reform measure on individual stocks yielded statistically significant results for 53 stocks out of the 174. Having said that, it is worthy of mention that this variable was not available for 97 stocks, this leaves us with 77 stocks only with this variable to be tested, out of which 53 yielded significant results as mentioned earlier. Out of the 53 stocks models, the VWAP20 coefficient variable had a negative sign indicating a negative correlation between the estimated time-varying efficiency variable and this variable itself, indicating that having the VWAP20 as reform measure improved efficiency for those stocks. This represents 64% of the statistically significant model outcomes.

Table 7.3: VWAP20 Variable Models Summary

Category	A	B	C	D	E	F	G
Available Stocks	41	45	33	17	22	11	5
Models With Statistical Results	25	21	11	2	2	0	0
Models Without Statistical Results	16	24	22	15	20	11	5
Variable Coefficient Significant at 1%, 5%, and 10%	25	14	9	1	0	0	0
Variable Coefficient Significant 5%, and 10%	1	0	0	0	0	0	0
Variable Coefficient Significant at 10%	1	1	1	0	0	0	0
Insignificant Models	2	6	1	1	0	0	0

Source: Researcher

Table 7.4: VWAP20 Variable Significant Results Summary

	Positive Impact	Negative Impact	Total Number of Models
Number	34	19	53
Percentage	64%	36%	100%

Source: Researcher

7.2.4.3 Order 20

Despite that this reform measure enables investors to freely price stocks up to the price limits of ±20%, it still limits the pricing decision for investors in some instances. The following analysis will be presenting the results pertinent to this variable on the different stocks in each category.

ORDER20 Results Interpretations and Conclusions

The ORDER20 variable was superseded by the VWAP20 variable. When The EGX management at that point of time decided to opt for ORDER20 instead of VWAP20 as a mechanism for price limits, with the target of limiting price movements and hence curbing volatility. Accordingly, the ORDER20 replaced the VWAP20. A priori theoretical indicates that this measure should result in worsening price efficiency as investors will not be freely pricing stocks, and hence this limitation of ±20% on the order should not allow new information to be reflected in the stock price during the day if the information is significant enough.

The impact analysis of this variable was conducted on all eligible stocks to be included in the models, so out of the 174 available stocks models, the variable was excluded from 32 and hence the variable was included in 142 model. Out of the 142, the models that yielded statistical significance for the ORDER20 variable was 55. Out of these 55 results, the variable coefficient for 41 of these models was with the wrong sign indicating that the change of the mechanism of the circuit breakers resulted in lowering the level of efficiency for those stocks. This represents almost 75% of the stocks that had statistically significant results.

Table 7.5: ORDER20 Variable Models Results Summary

Category	A	B	C	D	E	F	G
Available Stocks	41	45	33	17	22	11	5
Models With Statistical Results	25	27	19	4	5	0	0
Models Without Statistical Results	16	18	14	13	17	11	5

Variable Coefficient Significant at 1%, 5%, and 10%	24	21	13	3	4	0	0
Variable Coefficient Significant 5%, and 10%	1	1	1	0	0	0	0
Variable Coefficient Significant at 10%	0	0	1	0	0	0	0
Insignificant Models	0	5	4	1	1	0	0

Source: Researcher

Table 7.6: ORDER20 Significant Variable Results Summary

	Positive Impact	Negative Impact	Total Number of Models
Number	8	61	69
Percentage	12%	88%	100%

Source: Researcher

The results conforms with the theoretical foundation of stock markets whereby, the faster the stock prices incorporate new information regarding the traded companies' stocks, the more efficient the market would be. This is particularly true for this variable as it replaced the VWAP20 price limits mechanism towards the end of 2008.

According to the above, it is safe to assume that the changing the mechanism for the price limits and circuit breakers commencing September 2008, yielded a negative impact on the stock market efficiency when measured on individual stocks as evidenced by the models results.

7.2.4.4 Order 10

This measure further reduced the price limits from ±20 on the order to ±10 on the order. This reduction in price limits was a decision taken by The EGX management in March 2011 to curb the expected volatility in the market and limit price declines. The following subsections will be presenting the statistical findings of the models with this variable added to the list of explanatory variables.

ORDER10 Results Interpretations and Conclusions

The ORDER10 price limit replaced the ORDER20 price limit. The EGX management opted for ORDER10 price limit instead of ORDER20 in response to the January 2011 revolution with the aim of curbing volatility and continued to date. As mentioned earlier, a priori theoretical indicates that this measure should result in worsening price efficiency as investors will not be freely pricing stocks, and hence this limitation of ±10% compared to ±20% should not allow new information to be reflected in the stock price during the trading day if the information is significant enough.

Table 7.7: Order 10 Variable Models Outcomes

Category	A	B	C	D	E	F	G
Available Stocks	41	45	33	17	22	11	5
Models With Statistical Results	41	45	29	15	13	2	1
Models Without Statistical Results	0	0	4	2	9	9	4
Variable Coefficient Significant at 1%, 5%, and 10%	37	32	24	14	11	0	1
Variable Coefficient Significant 5%, and 10%	2	2	2	1	0	1	0

Variable Coefficient Significant at 10%	0	2	0	0	0	0	0
Insignificant Models	2	9	3	0	2	1	0

Source: Researcher

The impact analysis of this measure was conducted on all stocks, so out of the 174 available stocks models. The models that yielded statistical significance for the ORDER10 variable was 129. Out of these 129 results, the coefficient for 85 variable of these models was with the wrong sign indicating that the change of the mechanism of the circuit breakers resulted in lowering the level of efficiency for those stocks. This represents almost 66% of the stocks that had statistically significant results.

Table 7.8: ORDER10 Variable Results Summary

	Positive Impact	Negative Impact	Total Number of Models
Number	44	85	129
Percentage	34%	66%	100.0%

Source: Researcher

The results conforms with the theoretical foundation of stock markets whereby, the faster the stock prices incorporate new information regarding the traded companies' stocks, the more efficient the market would be. This is particularly true for this variable as it replaced the ORDER20 price limits mechanism after the January 2011 revolution.

According to the above, it is safe to assume that the changing the price limits and circuit breakers commencing March 2011, yielded a negative impact on the stock market efficiency when measured on individual stocks as evidenced by the models results given that having these price limits hinder the speed of stock price correction to company news,

and hence yields autocorrelation in returns which is a deviation from weak-form efficient market hypothesis.

7.2.4.5 Same Day Trading (T+0)

This reform measure was with the aim at improving market liquidity and enable investors the freedom of trading on an intra-day basis. We conducted the econometric analysis for all categories and the outcomes are presented in the following subsections.

Same Day (T+0) Results Interpretations and Conclusions

From the available 174 stocks models, 124 models provided statistical results. For ease of exposition, all models' outcomes are being summarized in the following table.

Table 7.9: Same Day Trading (T+0) Models Outcomes

Category	A	B	C	D	E	F	G
Available Stocks	41	45	33	17	22	11	5
Models With Statistical Results	41	44	27	12	15	10	5
Models Without Statistical Results	0	1	6	5	7	1	0
Variable Coefficient Significant at 1%, 5%, and 10%	37	39	15	9	6	6	2
Variable Coefficient Significant 5%, and 10%	1	1	1	1	1	0	2
Variable Coefficient Significant at 10%	1	0	1	0	1	1	0
Insignificant Models	2	4	10	2	7	3	1

Source: Researcher

Out of the 125 models resulting in significant variables, 100 models yielded a significant variable coefficient but with the wrong sign, and 25 yielded significant variable coefficient results but with right sign. The overall results implies that this reform measure had no significant impact on improving the efficient of stocks allowed to be traded with this mechanism as the number of variables having the right sign.

Table 7.10: Same Day (T+0) Significant Variable Coefficient Results Summary

	Positive Impact	Negative Impact	Total Number of Models
Number	25	100	125
Percentage	20%	80%	100%

Source: Researcher

It is worthy of mention that these findings do not conform with the expected impact on the time-varying efficiency, and the null hypothesis that the reform measure yielded improvement in the level of efficiency can be rejected. Having said that, this mechanism had some limitations in its application as set by The EGX and EFSA. This limitation as mentioned earlier is pertinent to the maximum amount an investor can be trading the eligible stocks with this mechanism and it is always unidirectional. In other words, this mechanism allows investors to buy then sell the newly purchased stocks on the same day without waiting for the traditional settlement cycle. However, this is only true as long the trading per investor does not exceed a certain threshold of total issued stocks per company. The other leg of selling the stocks and repurchasing them is not allowed, and accordingly eliminated the possibility of counterbalancing the buying powers generated by this trading mechanism.

Another possible explanation behind why the above statistical findings is that retail speculative investors dominated this trading mechanism as it is mainly a short term speculative behavior that usually does not match the policies of institutional investors and mutual funds, and hence their speculative behavior dominates trading with pressures towards creating a daily positive correlations in daily returns to materialize profits with this mechanism. If these pressures are coupled with shallow trading, this mechanism would result in the opposite of its desired outcome of increasing the volume of trading and hence improving the market efficiency.

7.2.4.6 Omnibus Variable

Omnibus Results Interpretations and Conclusions

The omnibus trading system allows fund managers to trade and then allocate the trading outcomes, either buy or sell on the investor accounts they are managing their funds on their behalf. We incorporated the variable proxy for this reform on the various statistical models of stocks to assess if it had a positive or negative impact on the time-varying efficiency parameter estimated in the AR(1) models. The following table summarizes some of the findings of the statistical analysis and regressions conducted on individual stocks present in each category.

Table 7.11: Omnibus Variable Regression Results

Category	A	B	C	D	E	F	G
Available Stocks	41	45	33	17	22	11	5
Models With Statistical Results	41	44	30	14	10	9	4
Models Without Statistical Results	0	1	3	3	12	2	1
Variable Coefficient Significant at 1%, 5%, and 10%	21	14	9	0	2	3	2
Variable Coefficient Significant 5%, and 10%	2	3	4	3	1	0	0
Variable Coefficient Significant at 10%	4	3	1	1	2	0	0
Insignificant Models	14	24	16	10	5	6	2

Source: Researcher

It is worthy of mention that from the 174 models, we were expecting at least 60 whereby the variable would not have explanatory powers due to its non-existence or limited number of observations available for that variable. From all models, 152 yielded statistical results, out of which 75 had significant variable coefficients. From the 75 models 23% of those models had a positive impact on the stock price efficiency and the remaining 58 (77%) had a negative impact.

Table 7.12: Omnibus Significant Variable Coefficient Results Summary

	Positive Impact	Negative Impact	Total Number of Models
Number	17	58	75
Percentage	23%	77%	100%

Source: Researcher

From the above, it could be inferred that this variable did not improve market efficiency as it was expected. This could be partially attributed to the limited use of these mechanisms as evidenced by the limited number of Omnibus accounts that trade stocks in the market despite having this mechanism since 2007. Recently, The EGX management introduced some amendments in the Omnibus trading system that ameliorated some of the problems that were facing asset managers in their use of this system. Having said that, it is too early to assess if these improvements would yield more omnibus accounts and its associated trading and accordingly its impact on efficiency.

7.2.4.7 FF Percent Variable

This variable is one of the most important variables to assess its impact against the time-varying stock efficiency variable. We conducted the analysis by applying the techniques mentioned earlier from estimating the time-varying parameter in the AR(1) model using state space modelling, and then regressing the estimated time varying parameter against the set of variables described earlier including the free float percent variable. The following subsections will summarize the main findings pertinent to this variable. This variable is a proxy for the reform pertinent to setting a minimum threshold for companies to have a free float in the stock market.

FF Percent Variable Results Interpretations and Conclusions

The percent of shares free floated by listed companies could be one of the most important reform measures conducted by the capital market regulators of Egypt and implemented

by The EGX. The minimum free floated shares stipulated by the listing rules implemented by The EGX mandated companies to maintain (float additional shares if necessary) in the market if the shares free floated in the market is below the 5% of total issued shares of the company.

Accordingly, with more additional shares floated in the market, either mandated by the regulations, or conducted voluntarily by companies, should yield more investors to participate in the company. The below table summarizes all model outcomes in terms of statistical results and significance.

Table 7.13: FF Variable Regression Results

Category	A	B	C	D	E	F	G
Available Stocks	41	45	33	17	22	11	5
Models With Statistical Results	41	45	33	17	21	11	5
Models Without Statistical Results	0	0	0	0	1	0	0
Variable Coefficient Significant at 1%, 5%, and 10%	36	40	31	15	17	7	5
Variable Coefficient Significant 5%, and 10%	1	1	1	0	0	1	0
Variable Coefficient Significant at 10%	0	0	0	0	1	0	0
Insignificant Models	4	4	1	2	3	3	0

Source: Researcher

The below table presents the significant variable results. Out of the 155 significant variable models results 75 models resulted in the variable improving the time-varying efficiency of those stocks. This represents 48% of the estimated models.

Table 7.14: FF Significant Variable Coefficient Results Summary

	Positive Impact	**Negative Impact**	**Total Number of Models**
Number	75	80	155
Percentage	48%	52%	100%

Source: Researcher

This ratio of the significant variable improving market efficiency is quite sizable, and when coupled with the findings pertinent to the estimates on the market level that yielded an improvement in the overall market efficiency level based on EGX30 index returns and free float of constituent companies, it reconfirms the importance of having sizable free floated shares and the positive impact on the stock market efficiency on the overall market and individual stocks.

7.2.4.8 Fix (Online) Trading Percent Variable

This proxy variable represents the introduction of online trading that accompanied the introduction of what is technologically known as the FIX protocol by The EGX. Additionally, EFSA issued the regulatory framework for licensing brokerage companies to introduce online trading for investors. The following subsections will be presenting the estimation models outcomes regarding this variable.

Online (Fix) Trading Percentage Variable Results Interpretations and Conclusions

The online reform measure is a technological and regulatory reform that allowed brokerage companies to offer online trading services to its clients. Segregating trading

occurring by the FIX protocol and the linked trading terminal to the exchange only enabled us to assess the impact of this reform on the efficiency of the stock market. The regression models indicate that this variable was significant in several models as shown from the below table and out of the 88 estimated models that yielded statistical results, the variable was significant in 75 of them.

Table 7.15: FIX Variable Regression Results Summary

Category	A	B	C	D	E	F	G
Available Stocks	41	45	33	17	22	11	5
Models With Statistical Results	17	27	18	8	7	8	3
Models Without Statistical Results	24	18	15	9	15	3	2
Variable Coefficient Significant at 1%, 5%, and 10%	12	23	14	8	6	2	3
Variable Coefficient Significant 5%, and 10%	2	0	1	0	0	1	0
Variable Coefficient Significant at 10%	1	1	0	0	0	1	0
Insignificant Models	2	3	3	0	1	4	0

Source: Researcher

Furthermore, the variable had the right sign for 61 of the significant estimated models, implying that there is clear statistical evidence that the introduction of this technological and regulatory reform improved market efficiency for the eligible stocks.

Table 7.16: FIX Significant Variable Coefficient Results Summary

	Positive Impact	Negative Impact	Total Number of Models
Number	46	29	75
Percentage	61%	39%	100%

Source: Researcher

7.2.4.9 Foreign Institutions Trading Percent Variable

Foreign institutions trading percentage variable is a proxy variable to assess to what extent the listing and disclosure rules entice investors to trade in the Egyptian market, especially after the issuance of the listing, delisting and disclosure rules by the CMA Board in 2002 and its updates. It is worthy of mention that this variable proxy could be assessing also the extent of the market depth, however, this should have been captured by the free float percentage proxy variable incorporated in the estimation models that should have captured the market depth impact on time-varying efficiency. The following subsections will be presenting the findings pertinent to each category.

Foreign Institutions Trading Percentage Variable Results Interpretations and Conclusions

Foreign institutions trading percentage is the proxy variable measuring the relevance and importance of market depth and disclosures quality in the market. We conducted the research on the available 174 stocks models, out of which 116 yielded statistical results of which 78 had a variable coefficient that was statistically significant as shown from the below table.

Table 7.17: Foreign Inst. Trading Variable Models Outcomes

Category	A	B	C	D	E	F	G
Available Stocks	41	45	33	17	22	11	5
Models With Statistical Results	28	30	19	14	14	10	1
Models Without Statistical Results	13	15	14	3	8	1	4
Variable Coefficient Significant at 1%, 5%, and 10%	16	9	8	8	7	6	0
Variable Coefficient Significant 5%, and 10%	4	5	3	2	1	0	0
Variable Coefficient Significant at 10%	2	4	0	2	1	0	0
Insignificant Models	6	12	8	2	5	4	1

Source: Researcher

In addition to determining the number of significant models, assessing the sign of the variable is important to identify whether the presence of foreign institutions as represented by its percentage of trading compared to total value traded of each particular stock on the time-varying efficiency parameter estimated in the AR(1) model. The following table summarizes the findings for all categories.

Table 7.18: Foreign Inst. Significant Variable Coefficient Results Summary

	Positive Impact	Negative Impact	Total Number of Models
Number	51	27	78
Percentage	65%	35%	100%

Source; Researcher

It can be inferred from the above results, that foreign institutions trading as a percent of total trading improved the efficiency in 51 cases out of the 78 with significant variable

coefficient. This represents 65% of the significant variable model outcomes and what can be inferred that foreign institutional trading and participation improves stock price efficiency on the stock level.

7.2.4.10 Egyptian Institutions Trading Percent Variable

This variable represents the percentage of Egyptian institutions value trading as percent of total trading per stock. This is proxy variable should be reflecting the impact of the funds regulatory framework and any other reform measure that aims at facilitating the establishment of new funds in the market and facilitating the trading of asset managers. The following subsections will be presenting the findings for category.

Egyptian Institutions Trading Percentage Variable Results Interpretations and Conclusions

Egyptian institutions trading percentage is the proxy variable measuring the relevance and importance of the regulatory framework governing the assets management function and funds establishment. We conducted the regression models on the available 174 stocks models, out of which 116 yielded statistical results of which 78 had a variable coefficient that was statistically significant as shown from the below table.

Table 7.19: Egyptian Inst. Trading Variable Models Outcomes

Category	A	B	C	D	E	F	G
Available Stocks	41	45	33	17	22	11	5
Models With Statistical Results	30	36	27	11	17	8	5

Models Without Statistical Results	11	9	6	6	5	3	0
Variable Coefficient Significant at 1%, 5%, and 10%	18	15	11	3	7	2	2
Variable Coefficient Significant 5%, and 10%	4	4	0	6	1	0	0
Variable Coefficient Significant at 10%	0	4	0	0	1	2	0
Insignificant Models	8	13	16	2	8	4	3

Source: Researcher

In addition to determining the number of significant models, assessing the sign of the variable is important to identify whether the presence of Egyptian institutions as represented by its percentage of trading compared to total value traded of each particular stock on the time-varying efficiency parameter estimated in the AR(1) model. The following table summarizes the findings for all categories.

Table 7.20: Egyptian Inst. Trading Significant Variable Coefficient Results Summary

	Positive Impact	**Negative Impact**	**Total Number of Models**
Number	55	25	80
Percentage	69%	31%	100%

Source: Researcher

It can be inferred from the above results, that Egyptian institutions trading as a percent of total trading improved the efficiency in 55 cases out of the 80 with significant variable coefficient. This represents 69% of the significant variable model outcomes and what can be inferred that Egyptian institutional trading and participation improves stock price efficiency on the stock level.

7.2.4.11 Other Variables

It is worthy of mention that there are some other variables incorporated in the secondary regression models, however, they did not represent any proxy reform apart from 1 variable that we chose to exclude from our analysis as it would not reflect the intended reform measure assessment. However, we opted to ad those variables to eliminate to obtain better outcomes for the entire model as a whole and separate those variables impact to get better estimates for the coefficients of the proxy variables. Those variables were described earlier, the outcomes will not be presented here for the ease of exposition. The only variable that we opted to exclude is the PER5 for several reasons, among which is that the dates of implemented the ±5% price limits was very far and most probably that period would have been accompanied by many other changes and this dummy variable would probably not measure the impact of this price limit on efficiency.

7.3 Chapter Conclusions

In this chapter we implemented the estimation models on the stock level for all eligible stocks that have been subject to some of the reform measures mentioned earlier. The large number of regressions for the available stock yielded varying results for each category for each variable. The below table will be summarizing how many times the proxy variable coefficient was significant, and the frequency of those estimated models yielding an improvement in the time-varying efficiency parameter by being negatively correlated with it. In other words, should the estimated variable coefficient have a negative sign, it implies that this variable improved the efficiency of this particular stock as opposed

to having the right sign. It is worthy of mention that regression models for individual stocks is always more difficult compared to index levels due to the witnessed volatility and lack of trading in some stocks. However, the large number of estimations could be a good indication for the general impact of those variables, and hence reforms on the estimated time-varying efficiency parameter.

The following table summarizes all variables and the associated significant coefficients with the sign of those variables to assess whether in most of the estimated models the variable had a positive or negative impact on the time-varying efficient parameter.

Table 7.21:Significant Variables Models Outcomes Summary

Variable	Positive Impact on Efficiency (%)	Negative Impact on Efficiency (%)	Models with Significant Coefficients
Same Day (T+0)	20%	80%	122
Omnibus	23%	77%	75
Free Float	48%	52%	156
Online (FIX)	61%	39%	75
Foreign Instit.	65%	35%	78
Egyptian Instit.	69%	31%	80
VWAP20	64%	36%	53
ORDER20	12%	88%	69
ORDER10	34%	66%	129
Discovery Session	27%	73%	44

Source: Researcher

It is worthy of mention that 7 out of the 10 proxy variable conformed with the theoretical foundations pertinent to the improvement of informational and price efficiency of individual stocks. The most important are the price limits on trading and the comparison between the three-proxy variable coefficient. The history of price limits in Egypt have been

described earlier with clear dates of switching from a certain threshold to the other. An intriguing finding is that, despite having a much higher volatility in the price of stocks because of the wide price limits and its method of calculation, it turned out to be the most effective in improving as evidenced by the number of stocks that witnessed better informational efficiency when VWAP20 was implemented compared to the tighter price limits. Of all significant VWAP20 variable model, 64% witnessed an improvement in efficiency due to the presence of those wide price limits. One of the potential explanations for this finding is that, providing pricing freedom for investors to account for the new information related to the company, the faster the stock price would reflect this new information and hence reduce the correlation of returns and hence daily dependency of returns. This is particularly true when compared to the outcomes pertinent to ORDER20 and ORDER10 variables. ORDER20 limits replaced VWAP20 with the start of the financial crisis as a mean by EGX management at that point of time to curb volatility and limit price movements on stocks. however, this volatility curbing worsened the level of efficiency significantly as evidenced by the number of stocks that showed a negative impact on efficiency by both variables.

Another important finding and conclusion from individual stocks analysis, is the confirmation that institutional trading improves the informational efficiency of stocks. Even though each proxy variable is measuring different reform measure with foreign institutional trading improving with better disclosure and governance, and Egyptian institution trading improving with the improvement of the regulatory framework governing the collective investment vehicles. Both of the trading variable resulted in an improvement

in the time varying-efficiency parameters of individual stocks in 69% and 65% of the significant variables models respectively. This implies, that all reform measures that would aim at improving disclosure and governance should entice more foreign institutional trading and hence improve efficiency.

Additionally, the online (FIX) trading seemed to have improved the level of efficiency as evidenced by the regression outcomes. This improvement enabled investors a much quicker response to company news and it seems that this quicker response improved the incorporation of information in the stock prices as 61% of the models with significant variable coefficient had the right sign indicating that trading conducted via fix had a positive impact on time-varying efficiency.

The free float percent of companies had a significant impact on the time-varying efficiency of individual stocks in almost 50% of the instances. This particular variable was important to incorporate as sizable free floated companies is considered a pre-requisite for institutional investors to invest in those companies. By having this variable incorporated in the model, it separates the impact of free float on the time-varying efficient parameter from other variables such as the institutional investors trading.

It is worthy of mention that three proxy variables yielded results that do not conform with the prior expectation of their impact on the time-varying efficiency coefficient of individual stocks. The three variables are the Same Day (T+0) trading variable, the Omnibus variable, and the discovery session. The Omnibus variable lack of positive statistical

significance on time-varying efficiency could be partially attributed to the limited use of this mechanism as evidenced by the limited number of Omnibus accounts that trade stocks in the market despite having this mechanism since 2007. Recently, The EGX management introduced some amendments in the Omnibus trading system that ameliorated some of the problems that were facing asset managers in their use of this system. Having said that, it is too early to assess if these improvements would yield more omnibus accounts and its associated trading and accordingly its impact on efficiency. According to the above, it can be said that the Omnibus trading mechanism did not support in the improvement of the time-varying efficiency of individual stocks, or at least say that the results are inconclusive and renders itself for further investigation and analysis.

Regarding the same day (T+0) trading variable, one of the possible explanations of the findings is the limitations that was set both the EGX and EFSA on the maximum amount to be traded with this mechanism per stock per investor. This mechanism allows investors to buy then sell the newly purchased stocks on the same day without waiting for the traditional settlement cycle of (T+2). However, this is only true as long the trading per investor does not exceed a certain threshold of total issued shares per company. The other leg of selling the stocks and repurchasing them is not allowed (short selling), and accordingly eliminated the possibility of counterbalancing the buying powers generated by this trading mechanism. Another possible explanation is that retail speculative investors dominated this trading mechanism as it is mainly a short term speculative behavior that usually does not match the policies of institutional investors and mutual

funds, and hence their speculative behavior dominates trading with pressures towards creating a daily positive correlations in daily returns to materialize profits with this mechanism. If these pressures are coupled with shallow trading, this mechanism would result in the opposite of its desired outcome of increasing the volume of trading and hence improving the market efficiency.

Another variable that yielded results that contradict with the prior expectations is the Discovery Session variable. The discovery session mechanism was put in place by The EGX management to allow investors to auction on the opening price of the stock to factor in any company, market or economic information that has been released after the trading session ends. This should allow the price correction to be swift as the opening price would be different than the closing price and the hence, reduce any autocorrelation of returns. Having said that, as a mean to reduce any potential price manipulation, The EGX put some constraints on the matching algorithm of the pre-opening auction (discovery session) that limited its usage significantly as mentioned earlier. This could explain the results seen so far.

Finally, we can infer from the results of the analysis conducted in this chapter that 7 out the 10 proxy variables conformed with the theoretical foundations and prior expectations and that indeed the proxy variables resulting from the reform measures implemented to reform the Egyptian stock market indeed had a positive impact on individual stocks time-varying efficiency. The other proxy variables yielded opposite results, however, there are

other possible explanations that could shed the light of the limitation set on these mechanisms that hindered their impact on individual stock efficiency.

In the next chapter, we will aim to assess the magnitude of the impact of the significant variable coefficients on the time varying coefficients to assess which of the above seven improving variables had the biggest impact on efficiency improvement on the market level and on individual stocks. Furthermore, a prioritization of these reforms can be conducted upon which future reform measures can be implemented guided by this prioritized outcomes.

8. Conclusions and Contributions

8.1 Introduction

The general aim of this thesis was achieved regarding the assessment of the FSRP and specific stock market reforms on the time-varying efficiency of the stock market. Furthermore, ranking these reforms should facilitate and guide future policy formulations of reform plans to have an efficient capital market. In this chapter, the summary of findings pertinent to the time-varying efficiency of the Egyptian stock market at large and for individual stocks listed on EGX, and the rank of the various reform proxy variables on efficiency will be presented in section 10.2. The contribution of the research to researchers and the reform policy formulation is presented in section 10.3, and finally limitations to the research and areas which warrant future research efforts are presented in section 10.4, and finally conclusions are presented in section 10.5.

Egypt's stock market has been granted the Emerging Market status by MSCI in 2001 and added to its indices. However, in the aftermath of the financial crisis, and the 2011 and 2013 revolutions, several large corporations decided to delist their securities from EGX resulting in a slowdown of trading from the one hand, and a decline of Egypt's companies weights in the index and hence the rising need to guide what should EGX and other stakeholders do in terms of reform measures to partially restore some of the activity. Egypt's weight decline is at the time whereby other markets are being granted emerging market status and indeed leading to the inclusion of several of those markets listed companies in the MSCI emerging market index with relatively significant weighs that are

much higher than Egypt which reduces Egypt's capital market competitiveness and attractiveness.

This thesis has been motivated by the rising need to develop the stock market activity in Egypt after the financial crisis and two revolutions that had a tremendous negative impact on the activity of the market. The situation in the market should not be left for the natural and organic developments, however it renders interventions to further activate and expand the market. This is especially true in the absence of a formally announced financial sector reform program coordinated between banking and non-banking financial regulators and players. An important facet of the reform's intervention is the prioritization of these future reforms.

This thesis capitalized on the advantage of having Egypt implemented a comprehensive financial sector reform program on two phases covering both the banking and non-banking financial sectors ending in 2012. The NBFS reforms comprised stock market specific reforms with the aim of activating the market which provided an opportune chance to identify the impact - if any - of some proxy variables on the time-varying efficiency of the Egyptian stock market at large and for individual stocks. The following section summarizes the research findings.

In this chapter we are going to draw conclusion on the comparative impact for the stock market level and for the individual stock models to identify the most significant reforms on the time-varying efficiency. It is worthy of mention that direct comparability of the

variables' coefficients would not be possible as each one has a different variation (standard deviation) level and the unit of measurement is different for some of the variables. Accordingly, we had to calculate the standardized coefficients for each variable in each model to be able to compare and rank within each model the variables that had a significant positive impact on the estimated time-varying efficiency parameters. This analysis will enable us to rank the proxy variables and not only identify which one has a significant positive impact on efficiency.

To standardize the coefficients we implemented step three that was mentioned in Chapter Three in the statistical model of choice section by linking the coefficient estimate (λ_i) for each variable in the second regression models for the market (EGX30) and the individual stocks models , with the standard deviation of the independent (σ_x, $the\ time-varying\ beta$) and dependent variables (σ_y, $the\ proxy\ variables$) used in step two using the following equation:

$$Standardized\ Coefficients = \lambda_i * \left(\frac{\sigma_x}{\sigma_y}\right)$$

The following sections will be presenting the aggregate ranking of the variables after conducting the abovementioned calculations.

8.2 Conclusions: Market Level Variables Rank Summary

Standardizing the coefficients enables us to compare the impact of the proxy variables on the time-varying efficiency parameter. As mentioned in Chapter Seven, the dummy variable reflecting the date of introduction of the Financial sector Reform Programs for both the banking and non-banking financial sector was significant and of the right sign and after adjusting for the scaling issue as mentioned in the previous section, it turned out to be the most impactful on the improvement of the time-varying efficiency parameter on the market wide level. This confirms the null hypothesis that the reform measures that are resulting in non-tradable variables, improved the overall market efficiency per se, and was ranked first amongst all other variables that had a statistically significant explanatory powers on the estimated time varying efficiency parameter.

The second most impactful variable was the free float percent variable, hence implying that any reforms that result in a larger free float of companies, irrespective of magnitude of the free float, improves the estimated efficiency parameter and reflects that introducing the minimum free float percent as stipulated in the Listing, Delisting and Disclosure Rules issued by the Capital Market Authority Board in 2008 as a reform measure yielded positive results on efficiency. This conforms with our prior expectations that free float would improve the estimated time-varying efficiency estimate.

The third variable in terms of rank that proved to have a positive impact on the time-varying efficiency, yet with a much smaller magnitude, is the same day (T+0) trading variable. Despite that this proxy variable did not improve the efficiency on the individual

stock levels, aggregated on the market level yielded a positive result on efficiency albeit with a much smaller magnitude compared to the first two variables.

The fourth variable ranked and resulting in a positive impact on the estimated time-varying efficiency parameter was the trading activity associated with Egypt Telecom implying that the trading activities associated with newly publicly offered companies could improve the efficiency of the entire market. However, this finding must be taken with caution, as the other significant variable pertinent to the offered companies, namely, Sidi Kerir Petrochemicals, did not improve efficiency. The final company yielded insignificant results.

The fifth and last variable that had a positive impact in terms of rank was the Omnibus trading percent variable. Despite the limitations imposed on the use of this mechanism, when the omnibus trading is aggregated on the market level, it yielded a positive impact on the efficiency on the market level, albeit at with a much smaller magnitude.

It is worthy mention, that two variables that negatively impacted the efficiency, was the two dummy variables pertinent to the instability period, and relative stability. Both variables coefficients reflected the negative impact of the financial crisis, and the negative economic impact of the two revolutions witnessed in Egypt in 2011 and 2013. The following table summarizes the ranked standardized coefficients for the estimated variables

Table 8.1: Market Level Improving Efficiency Variables Rank

Variable	Coefficient	Std. Error	t-value	t-prob	Standardized Coefficients
FSRP I II	-0.0122487	0.000366	-33.40	0.0000	-0.4105322
FF	-0.0632573	0.002061	-30.70	0.0000	-0.2972171
Intra	-0.0078607	0.002090	-3.76	0.0002	-0.0353581
ETEL	-0.0321953	0.007860	-4.10	0.0000	-0.0314480
Omni	-0.0263664	0.009452	-2.79	0.0053	-0.0266032
AMOC	0.0157700	0.012410	1.27	0.2038	0.0091054
SKPC	0.0219726	0.009162	2.40	0.0165	0.0179177
INSTIT	0.0146889	0.000825	17.80	0.0000	0.1281120
Insta_D	0.0168122	0.000331	50.90	0.0000	0.5915402
RS_D	0.0370947	0.000379	97.90	0.0000	0.8670573

Source: Researcher

In the below table we will be reproducing Table (4.2) comparing the expected impact of the reform measures implemented during the FSRPs and the actual estimated impact on efficiency are estimated form our study. Worthy to note, that some categories and reforms presented in Table (4.2) has not been formally tested and hence are not included in the below table.

Table 8.2: Expected Vs. Research Outcomes on the Market Level (EGX30)

Reforms Category	Detailed Reform / Measure	Expected Impact	Proxy Variable	Main Findings	Actual Impact on Efficiency & Rank
The FSRPs	*All banking and non-banking reforms*	*Positive (+ve)*	*Dummy Variable (FSRP I II)*	*Significant & with the right sign*	*Positive (+ve) First*
Turnover & Liquidity Enhancement Reforms/Measures	*Intra-day Trading*	*Positive (+ve)*	*Same day trading value to total trading value for all stocks in the market (%)*	*Significant & with the right sign*	*Positive (+ve) Third Yet with a smaller magnitude*
	Collective Investment Vehicles Regulations	*Positive (+ve)*	*Institutions trading to total market trading (%)*	*Significant variable but with the wrong sign*	*No Improvement*
	Online trading and omnibus accounts introduction	*Positive (+ve)*	*Omnibus trading to total market trading (omnibus only)*	*Significant & with the right sign for the Market*	*Positive (+ve) Fifth Yet with a smaller magnitude*
Market Breadth & Depth Reforms/Measures	*Partial floatation of Government Owned Enterprises (GOE)*	*Positive (+ve)*	*Egypt Telecom value traded stocks to total market trading (%)*	*Significant with the right sign, & standardized coefficient larger than others*	*Positive (+ve)* *Fourth for the significant one (depends on size of issuance)*
			SKPC value traded stocks to total market trading	*Significant (lesser extent) with the wrong sign*	
			AMOC value traded stocks to total market trading	*Insignificant and with the wrong sign*	
	Minimum free float and issuance size requirement	*Positive (+ve)*	*Free float percentage of EGX30 constituent companies (%)*	*Significant & with the right sign*	*Positive (+ve) Second*

Source: Researcher

8.3 Conclusions: Individual Stock Level Variables Rank Summary

8.3.1 VWAP 20 Variable Rank Summary

As can be seen from the below table, in the 34 individual stock models that the VWAP20 proved to be statistically significant and of the right sign, it was ranked first and second in 26 times of those models compared to other variables that had a positive impact on the time-varying efficiency. This represents 76.5% of those models implying that whenever this wide price limit was available, with sufficient observations to have a positive impact on the estimated time varying efficiency parameter, it will rank highly amongst those other variables implying that it is one of the most important reforms.

Table 8.3: VWAP20 Variable Efficiency Improvement Rank

Category/Rank	1	2	3	4	5	6	Total
A	13	4	3	1	0	0	21
B	5	1	1	1	0	1	9
C	2	1	0	0	0	0	3
D	0	0	0	1	0	0	1
Total	20	6	4	3	0	1	34

Source: Researcher

8.3.2 Free Float Variable Rank Summary

As can be seen from the below table, in the 75 individual stock models that the Free Float Percent proved to be statistically significant and of the right sign, it was ranked first and second in 56 times of those models compared to other variables that had a positive impact on the time-varying efficiency. This represents 74.6% of those models implying that whenever the free float increases, it has a positive impact on the estimated time varying

efficiency parameter, it will rank highly amongst those other variables implying that it is one of the most important reforms.

Table 8.4: Free Float Percent Efficiency Improvement Rank

Category/Rank	1	2	3	4	5	6	Total
A	5	4	0	1	1	1	12
B	10	6	1	1	2	1	21
C	10	0	4	1	0	0	15
D	4	3	0	0	1	0	8
E	3	4	1	1	1	0	10
F	4	1	0	1	0	0	6
G	1	1	0	1	0	0	3
Total	37	19	6	6	5	2	75

Source: Researcher

Conducting a joint analysis on the models whereby both variables coefficients turned out to be statistically significant and of the right sign, VWAP20 was ranked before FF Percent in more than 71% of the times, implying that both variables contributed to the improvement of the time-varying efficiency of individual stocks, however, VWAP20 was of a bigger factor in the improvement compared to the FF.

8.3.3 Foreign Institutions Trading Variable Rank Summary

Out of the 51 individual stock models that the foreign trading percent variable proved to be statistically significant and of the right sign, it was mostly ranked third with 19 models, and second with 12 models compared to other variables that had a positive impact on the time-varying efficiency. This implies that despite that this variable was significant and of

the right in a large number of individual stock models, its rank is not the highest in terms of improving the time-varying efficiency parameter.

Table 8.5: Foreign Institutions Variable Efficiency Improvement Rank

Category/Rank	1	2	3	4	5	6	Total
A	2	3	4	4	0	1	14
B	0	3	6	1	1	0	11
C	1	2	2	0	1	0	6
D	1	1	4	1	1	0	8
E	2	1	2	1	0	0	6
F	2	2	1	0	1	0	6
Total	8	12	19	7	4	1	51

Source: Researcher

8.3.4 Egyptian Institutions Trading Variable Rank Summary

Out of the 55 individual stock models that the Egyptian institutions trading percent variable proved to be statistically significant and of the right sign, it was mostly ranked third with 16 models, and second with 15 models compared to other variables that had a positive impact on the time-varying efficiency. This implies that despite that this variable was significant and of the right in a large number of individual stock models, its rank is not the highest in terms of improving the time-varying efficiency parameter.

Table 8.6: Egyptian Institutions Variable Efficiency Improvement Rank

Category/Rank	1	2	3	4	5	6	Total
A	4	3	7	1	1	1	17
B	1	5	5	0	1	0	12
C	0	5	0	1	0	0	6
D	1	1	1	1	2	0	6
E	3	0	3	3	0	0	9
F	2	1	0	1	0	0	4
G	0	0	0	0	0	1	1
Total	11	15	16	7	4	2	55

Source: Researcher

8.3.5 Other Variables and Summary

Other variables proved (as expected) to have a *negative* impact on efficiency, are ORDER20 and ORDER10 which delays the possible price adjustment process and price corrections, which - in itself – should have a negative impact on efficiency. The findings and the magnitude of individual stocks that this measure had a negative impact on its time-varying efficiency parameter is quite significant implying that price limits, despite aiming at reducing volatility, has a secondary effect of reducing the price adjustment process speed and hence leads to a deterioration in the efficiency of the stock market. The below table presents the summary of ranks for the different variables that had a positive effect of the time-varying efficiency for individual stocks regression models.

Table 8.7: Individual Stocks Variables Rank Summary

Variable	Rank	1	2	3	4	5	6	Total
VWAP20	Frequency	20	6	4	3	0	1	34
	Percent	58.8%	17.6%	11.8%	8.8%	0.0%	2.9%	100.0%
Free Float (%)	Frequency	37	19	6	6	5	2	75
	Percent	49.3%	25.3%	8.0%	8.0%	6.7%	2.7%	100.0%
Egyptian Inst. Trading (%)	Frequency	11	15	16	7	4	2	55
	Percent	20.0%	27.3%	29.1%	12.7%	7.3%	3.6%	100.0%
Foreign Inst. Trading (%)	Frequency	8	12	19	7	4	1	51
	Percent	15.7%	23.5%	37.3%	13.7%	7.8%	2.0%	100.0%

Source: Researcher

The findings show that the variables that ranked high in terms of percentage of frequency of being ranked first for impact on the improvement of efficiency was the VWAP20 which allows for free price movements of the stocks, followed by the free float percent of companies, albeit with a higher absolute frequency, and finally Egyptian and foreign institutional trading, respectively. This conforms with our prior expectations towards those variables impact on the time varying efficiency.

8.4 Research Overview and Contributions

8.4.1 Research Overview

Following the introductory Chapter that stipulated the research questions, Chapter Two presented selected literature covering the definition of stock market efficiency, types and level of strength of efficiency, different statistical techniques to test for stock market efficiency, and specific cases of inefficiency being tested such as the calendar anomalies. Furthermore, selected research on the link between degree of financial development including the capital markets on the economic efficiency and development is presented. Some market microstructure studies that are linking trading to efficiency is presented also. Studies covering the Egyptian market is presented.

The wide array of research covering efficiency is quite vast given the relevance and importance of the area of stock markets efficiency. Most of the estimation models adopted deterministic models with single points estimates of efficiency of the markets. Few researchers adopted estimation models resulting in time-varying efficiency parameter

estimate, and also few studies linked market specific variables and market microstructure to the efficiency of markets. The former is mainly conducted on emerging markets as it safe to assume that markets evolve through time and researchers and observers should not be expecting that these markets are efficient with the inauguration of those markets. Some studies presented the link between financial liberalization and the stock market efficiency and some emerging markets. The results are inconclusive in general with a larger number indicating that emerging markets witness or witnessed at some point of time some inefficiency based on the predictability of returns.

The results covering the Egyptian market yielded contradictory results also, however, the majority of studies showed that the Egyptian market was not weak-form efficient except for few studies. No study attempted to relate the financial sector reform program commenced in 2004 on the market efficiency.

Chapter Two also presented the reform programs and measures implemented for the banking, insurance and mortgage finance sectors and the situation before intervening in those markets with the FSRP and after the interventions. It was evident that prior to the implementation of the FSRPs, the entire financial sectors were witnessing sever undercapitalization, and weak prudential regulations governing those sectors. The mergers, acquisitions and restructuring of the different banking and insurance entities that took place in Egypt is presented also in this chapter. The banking sector was overbanked and under branched with banking institutions facing increasing amounts of non-performing loans that jeopardized the stability of the entire financial sector. With several

mergers and acquisitions taking place via the stock market after increasing the minimum capital requirements, and with the strong enforcement of new prudential regulations, the banking sector indicators improved dramatically with a significant drop in NPLs and an improvement in the solvency of banks. These reforms did not result in direct measurable indicators pertinent to the stock market, however, the impact should be positive on the evolving efficiency and the FSRPs are measured via constructing a proxy dummy variable as presented in Chapter Six.

Chapter Three covered the spectrum of research methodology and the statistical model of choice for conducting the desired research. The different available philosophical choices and research approached were presented. It was concluded that given the nature of the research at hand, it is safe to assume that the research will be based on positivism given the statistical nature regarding time-varying stock market efficiency. Furthermore, the statistical model of choice has been presented. The choice of assessing the efficiency of the Egyptian stock market on an evolving basis resulted in the choice of conducting the estimation of the dependency of returns using Kalman filtering techniques in a state space modelling context to estimate the time-varying efficiency parameter for both the market at large and individual stocks. Furthermore, ordinary regression models are implemented to establish the statistical relationship between the proxy variables and the estimated time varying efficiency parameter link between the reform proxy variables. The statistical adjustment conducted for the variables coefficients to allow for the comparability of proxy variables' parameters is presented in this chapter.

Chapter Four presented the reform measures implemented pertinent to the stock market. It categorized reforms based on the impact on the market as follows: 1) market depth and breadth reforms, 2) volatility curbing measures, 3) turnover and liquidity enhancement reforms, and finally, 4) price manipulation, information asymmetry reduction and transparency reforms. The details of each reforms within each category is presented in this chapter. The expected impact of these reforms on the market has been presented to assess whether the empirical assessment of their impact matches the beforehand expectations towards them.

Chapter Five covered the proxy variables construction and sources of data. The detailed data gathered and requested from the exchange is quite unique in a sense that the proxy variables pertinent to liquidity enhancement measures such as the same day and omnibus trading required breaking down the daily trading volume and value using those mechanisms per stock and aggregating this data to get market proxies. It is the first type of studies to obtain such data.

In Chapter Six, we estimated the time varying efficiency parameter for the market at large using EGX30 index as the market proxy. The parameter was found to be statistically significant and evolving though time. Regressing the proxy variables constructed in Chapter Five on the estimated time varying efficiency parameter was conducted in this chapter. The estimated variables coefficients sign indicated its impact on the estimated time varying efficiency parameter. Chapter Seven implemented the same routine but for

individual stocks, however, with different proxy variables reflecting the reforms that impacted those stocks.

The standardized coefficients of the proxy variables parameters have been calculated in this chapter (Chapter Eight), and a rank of reforms that had the best impact on improving the time-varying efficiency parameter has been conducted. The findings and conclusions of this chapter are the guiding factor for policy makers formulation of reform agendas for capital markets and the contributions of this research are presented below.

8.4.2 Contribution to Research

The financial sector reform programs implemented in Egypt starting 2004 were welcomed by market participants, domestic investors, and international investors whether investing in listed equities or investing directly in the country in greenfield or brownfield projects. However, the financial crisis and the two revolutions masked the reforms implemented in those periods and had a negative impact on the market activity. The contribution to researchers could summarized as follows:

1) This research extended the assessment of the time-varying efficiency of the Egyptian stock market on the market level beyond the year 2009 to cover the period of financial crisis and the two revolutions witnessed in Egypt in 2011 and 2013. The findings are generally consistent with other researches covering the efficiency of the Egyptian stock market that the market is not consistent with the weak-form efficiency market hypothesis, and that indeed the efficiency level

showed improvements in some periods and a deterioration in some other periods post 2006.

2) The research was the first to assess individual stocks price efficiency in the Egyptian market on a time-varying basis.

3) First study to construct numerical proxy variables that represent specific reform measures implemented during the financial sector reform programs such as same day trading, omni-bus accounts, circuit breakers widening/narrowing and more. The variables construction will enable future research to be conducted on the specific reforms and other areas such as the impact of reforms on stock market volatility that has not been assessed in this thesis.

4) The first research to formally and statistically link reforms to assess the overall impact of introducing and implementing the financial sector reform programs on the time-varying efficiency of the Egyptian stock market while segregating the impact of the financial crisis in 2008 and the two revolutions that took place in Egypt in 2011 and 2013. Indeed, the FSRP per se is found to have a positive impact on market efficiency and indeed market efficiency improved in the initial years of implementing the reforms

5) The first research to formally test for and quantify the impact of the specific reform measures using the constructed proxy variables on the time-varying efficiency for the Egyptian market on the market and individual stocks levels.

Identifying and ranking the impact of the reform measures on market and individual stocks efficiency is another contribution. Not only did we assess whether there was an impact or not, we ranked the impact to guide future research in this field.

To summarize the theoretical contribution of this research would be: 1) extending the time-varying efficiency estimation beyond 2009 on the market level, 2) estimating the time-varying efficiency for the first time on individual stock level, 3) assessing the financial sector reform measures explanatory power to the variability of the time-varying efficiency, 4) ranking the reforms impact on the time-varying efficiency on the market and individual stock level. This has not been formally conducted on a statistical level before and it lays the ground for future areas of research pertinent to this area in the Egyptian market that would not have been possible without the identification of reforms, proxy variables' construction and linkage between them and the stock market.

8.4.3 Contribution to Policy Making

8.4.3.1 Reform Plans Design

Stock markets in developed markets that are not bank-based have developed organically as companies are aware with the potential benefits of listing and trading their own stocks, and regulators, exchanges and other policy makers understood the importance and the impact of having a developed, vibrant and efficient capital markets. Accordingly, regulatory frameworks, trading rules, disclosure rules and more have been developed for a number of years, and the markets grew *organically* with significant participation by the different players including the pension funds and endowments. However, for emerging markets exchanges, the situation is quite different, with the relative recent inauguration of these markets, the development path could not rely solely on the organic development as it would have taken a prolonged period to witness improvement in the market.

Accordingly, different policy makers opted for drafting reform agendas and interventions with the aim to jump-start the stock market activity with the target of having the market grow organically afterwards.

As mentioned earlier, the GoE formulated a comprehensive FSRPs in 2004 over eight years that had an assumed positive impact on the activity of the market. However, the setbacks associated with the international financial crisis and the two revolutions slowed down extensively the potential organic growth and activity of Egypt's stock market. The current need of designing a reform plan for re-activating the market and moving towards more efficiency is on the rise. Several debates are being raised amongst all stakeholders regarding the priority and sequencing on reforms.

This thesis capitalized on the FSRPs implemented measures to assess the impact of reforms on the stock market efficiency. Finding that the FSRPs proxy variable as the most contributing variable to market efficiency is an indication that markets respond positively to clearly announced and implemented reform measures. Furthermore, breaking down the reforms with proxy variables measuring a specific category of reforms, detecting its impact, and finally ranking the impact is of paramount importance for policy makers, regulators and exchanges to design reform programs that would result in the best efficiency impact. Freedom of stock pricing by investors, and free float size – irrespective of the magnitude – proved to be of a significant positive impact, liquidity enhancing reforms and measures proved to be important on the market level but of a secondary

effect. For individual stocks, institutions trading proved to be another important pillar for efficiency improvement.

According to the above, the findings of all of the above implies that designing future reform plans and policies could be guided by those findings as follows:

1) A clearly articulated financial sector reform plan announced and widely accepted by the market, per se, should have a positive impact on the market efficiency.

2) Increasing the free float of listed companies improves market efficiency. This is true for the entire market and for individual stocks. Accordingly, incentivizing companies to increase the free float should be on the top of the stock market reform agenda.

3) Free pricing of stocks improves the price adjustment mechanism for stocks by investors, and hence improves market efficiency. Measures enabling for free pricing should on top of the agenda also.

4) Institutional trading is another improving variable, however, to a lesser extent to the previous potential category of reforms, and hence improving the ease of establishing funds, providing incentives for funds investors should be on the list as the higher institutional trading – irrespective of the magnitude – improves efficiency.

5) Offering sizable companies on exchanges proved to be an important pillar, and hence, partially floating state-owned enterprises is important to increase participation and the market breadth, and hence improve market efficiency.

6) Last but not least, trading mechanisms such as the same-day trading could improve efficiency, albeit to a lesser extent compared to the aforementioned reforms, are still an important pillar to be incorporated in the reform agenda.

From the above, it can be deduced that the research findings can contribute significantly as a guidance to the policy formulation of reform programs and agenda. Additionally, it is worthy of mention that the potential use of this policy guidance can be extended to other emerging markets in terms of policy guidance and of the trading mechanisms to assess the impact of the reform measures on other emerging markets.

A final point to note, having a vibrant, efficient, and inclusive stock market, not only improves capital allocation in the economy and hence improves the long-term economic growth of the emerging and developed economy, it also facilitates the mandate of central banks regarding monetary policy management. When stock prices efficiently reflects public information in the market coupled with sizable participation from the general public, a contractionary or expansionary monetary policy will have an impact on the real economy in terms of investment and consumption decisions and hence achieve the monetary policy target. This is called the asset price channel of the monetary policy transmission mechanism.

8.4.3.2 Stock Exchanges' Business Models

Most securities exchange - especially in emerging markets – are primarily concerned with the trading rules form the one hand, and the technological advancement of their trading

and surveillance platforms. However, with the other competing markets in the financial field from venture capital, private equity, crowd funding platforms, bank lending and the new rise of crypto currency markets and the Initial Coins Offerings, exchanges are under extreme pressure for securing sufficient business and trading activity on the exchanges themselves.

According to the above, a potential policy outcome and contribution of this research is that exchanges should seriously reconsider their business model. It is not sufficient for exchanges to be on the wait for companies to approach the exchanges for listing and trading if they are aiming to have an efficient market. Exchanges should have an active role in attracting new companies to get listed and traded via changing the approach of dealing with potential companies and educating them aggressively with the benefits of listing, and work extensively with listed companies on the importance of increasing the free float of shares. Additionally, exchanges should have a role in the early stages of finance of companies with guidance, support, and possibly targeted policies to increase the pipeline of potential companies to be listed and traded.

All of the above stems from the findings that the free float had a superior impact compared to both same day and omni bus trading variables, and that the traded shares of publicly offered companies improved efficiency given it is sizable enough of an offering.

8.5 Research Limitations & Possible Future Areas of Investigation

The limitations pertinent to the research would be the segregation of companies according to size. The construction of proxy variables was designed to eliminate the size impact on the variable to derive size-neutral results. Further investigation could be possible to see if the results change based on the size of companies being investigated.

Another possible additional limitation is the lack of specific announced data regarding the price manipulation practices conducted in the market and on which specific stocks, and hence the impact of the issuance of the regulatory framework could not be assessed. The data required would require the approval by the market regulator and the exchange to disclose this data to the researcher, but they will definitely refute for this particular information on the cases including the specific stocks that witnessed such manipulation practices to be disclosed to the public, and accordingly, rendering the research unpublishable given the lack of disclosure. However, if researchers could come up with other proxy variables to measure the perception of those practices, or quantify via issuing an index, the impact of this reform measure could be tested.

Formally testing the quality of disclosure and governance would require extensive company specific research and data gathering. This is another area of limitation as the thesis was trying to cover the impact of reforms at large and the impact of specific quantifiable reforms and measures. An extension that would add more insights towards the findings and the historical impact assessment rank of reform measures used to guide future designs of reform programs would be formally testing the impact of improved

disclosure quality, governance practices, and finally protecting minority shareholders on the stock market efficiency. An indicator that can be used, that relies on secondary data or the presence of the regulations irrespective of the implementation of those regulations is the Minority Investors Protection rank published in the Doing Business annual reports developed by The World Bank Group. Having said that, the rank is published with a time lag and is of an annual frequency only. This does not avail the testing on high frequency data and observations such as the ones used in this thesis.

8.6 Research Conclusion

In this research we aimed at assessing the financial sector reforms and measures impact on the time-varying efficiency of the stock market. The research hypothesis have been addressed and it was found that indeed the first hypothesis was not rejected of having the overall reform measures improving the efficiency of the time-varying efficiency, the second hypothesis as well was not rejected as some of the reforms had a positive impact on efficiency but with a varying magnitude. Finally, the implications of the findings of this research can be extended beyond the Egyptian context. The similarities between emerging stock exchanges renders the findings to be possibly used as a guidance in other markets.

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9. Annex (1): Variables with expected no explanatory powers and the number of models associated with the variable

Table 9.1: Category B Expected No Explanatory Powers Variables

Number of Stocks	Variable(s) without explanatory powers
23	VWAP 20
7	Omnibus
7	ORDER5
6	DS_TOP
2	SD (T+0)

Source: Researcher

Table 9.2: Category C Expected No Explanatory Powers Variables

Number of Stocks	Variable(s) without explanatory powers
12	VWAP20 + Omnibus
3	DS_TOP + Omnibus
4	DS_TOP + SD (T+0)
3	DS_TOP + PERC5
1	DS_TOP + VWAP20
1	Omnibus + SD (T+0)
4	PERC5 + VWAP20
2	VWAP20 + ORDER20
3	VWAP20 + SD (T+0)

Source: Researcher

Table 9.3: Category D Expected No Explanatory Powers Variables

Number of Stocks	Variable(s) without explanatory powers
3	VWAP20 + DS_TOP + ORDER20
2	DS_TOP + Omnibus + SD (T+0)
1	DS_TOP + PERC5 + VWAP20

1	DS_TOP + Omnibus + VWAP20
1	DS_TOP + Omnibus + ORDER5
2	DS_TOP + Omnibus + VWAP20
1	VWAP20 + Omnibus + ORDER20
4	VWAP20 + Omnibus + ORDER5
1	VWAP20 + SD (T+0) + Omnibus
1	VWAP20 + ORDER5 + Omnibus

Source: Researcher

Table 9.4: Category E Expected No Explanatory Powers Variables

Number of Stocks	Variable(s) without explanatory powers
9	VWAP20 + DS_TOP + Omnibus + SD (T+0)
4	DS_TOP + Omnibus + VWAP20 + ORDER20
3	PERC 5 + VWAP20 + ORDER20 + ORDER10
3	Omnibus + SD (T+0) + VWAP20 + ORDER20
2	DS_TOP + Omnibus + PERC5 + VWAP20
1	Omnibus + SD (T+0) + PERC5 + VWAP20

Source: Researcher

Table 9.5: Category F Expected No Explanatory Powers Variables

Number of Stocks	Variable(s) without explanatory powers
9	DS_TOP + PERC5 + VWAP20 + ORDER20 + ORDER10
2	DS_TOP + Omnibus + SD (T+0) + VWAP20 + ORDER20

Source: Researcher

Table 9.6: Category G Expected No Explanatory Powers Variables

Number of Stocks	Variable(s) without explanatory powers
2	DS_TOP + SD (T+0) + PERC5 + VWAP20 + ORDER20 + ORDER10
3	DS_TOP + Omnibus + PERC5 + VWAP20 + ORDER20 + ORDER10

Source: Researcher's Calculations

10. Annex (2): Models Results Summary per Variable per Category of Stocks

10.1 Discovery Sessions (DS_TOP)

Category A

This variable showed explanatory powers to the variability of the time-varying AR(1) variable, however, this explanatory powers was not statistically significant for most stocks regressions in this category. The variable parameter was statistically significant for 4 stocks only at the traditional significance level of 1%, 5% and 10%, for 3 stocks at the 10% significance level only, and was statistically insignificant for the remaining 34 stocks in this category.

Further analysis of the results indicates that amongst the significant variables' coefficients, only one stock witnessed a negative correlation with the time-varying efficiency parameter (AR(1)) as evidenced by the negative value of the coefficient.

Category B

Out of the 45 companies representing this category that yielded statistical outcome for this variable, 39 were insignificant variable coefficients, and 2 were significant at the 1%, 5%, and 10%, and 3 at the 5% and 10%, and 1 at the 10% significance levels. The 6 significant variables at the different levels of significance yielded the wrong sign.

Category C

Out of the 33 companies, 7 witnessed significant coefficient on all conventional levels of statistical significance for this variable with 2 only with the right sign (negative value), one stock model variable coefficient was significant at the 5% and 10% only while the remaining 25 yielded insignificant variable coefficients.

Category D

Out of the 17 companies represented in this category, 6 models yielded statistically significant results for this variable, albeit at different degrees of significance with 2 models with variable coefficient significant at the 1%, 5%, and 10% significance levels with one of them having the right sign (negative sign for the variable coefficient), 3 of them are significant at the 5% and 10% and the two of them having the right sign, and 1 at the 10% only with one having the right sign. The remaining 11 companies models had coefficients with no statistical significance and hence could not be accounted for in the analysis.

Category E

Out of the 22 companies' models 19 yielded statistical results for the variable out of which 5 models yielded statistically significant results for this variable at all degrees of significance, 2 models at the 5% and 10%, and 1 model at the 10% and 11 models yielded insignificant statistical results. Out of the 8 models with significant variable coefficients, 2 yielded the right sign and 6 with the wrong sign.

Category F

In this category that comprises 11 companies, all of them yielded statistical results, however, 6 of them with insignificant variable coefficient. From the remaining 5 models, 1 was significant at 1%, 5%, and 10% significance levels and 2 at the 5% and 10% and 2 at the 10%. From the 5 significant variable models, 2 yielded the right sign and 3 the wrong one.

Category G

In this category that comprises 5 companies, the five yielded statistical results, however, 1 was with a variable coefficient that was insignificant, 2 with a variable coefficient significant at the 1%, 5%, and 10% and 2 at the 5% and 10% significance levels. All 4 significant models yielded the wrong sign.

10.2 VWAP20

Category A

In this category, we had 41 company regressions. The statistical models resulted in 29 models with statistical results for the variable VWAP20, out of which 25 model variable coefficient was significant at the 1%, 5%, and 10% levels of significance, 1 model at the 5% and 10%, and 1 model at the 10% significance level, and 2 models with statistically insignificant results. For the 25 significant models results, 20 had the right sign (negative coefficient sign) indicating a positive impact on the time-varying efficiency estimated parameter derived from the AR(1) model, 5 had the wrong sign indicating a negative impact on the time-varying efficiency estimated parameter. The model with significance

at 10% had a VWAP20 coefficient with the right sign, while the remaining model had the wrong sign.

Category B

In this category, 45 models are available, out of which 24 models yielded no statistical results for this variable. This left us with 21 models with statistical results. Out of the 21 model, 14 model comprised the VWAP20 variable being statistically significant in partially explaining the variability in the independent variable representing the AR(1) time-varying model parameter at the 1%, 5% and 10% significance levels, 1 model with the VWAP20 variable parameter significant at the 10% significance level only, and 6 models with the VWAP20 variable parameter being statistically insignificant.

Out of the 14 VWAP20 significant models, 8 had a positive impact on the time-varying estimated beta and 6 had a negative impact. The model with significance at 10% only resulted that the VWAP20 had a positive impact on the time varying efficiency.

Category C

This category comprises 33 companies, 22 models yielded no statistical results for this variable. This leaves us with 11 models whereby 1 had the VWAP20 variable coefficient being insignificant, and 9 models with significant variable coefficients at the 1%, 5%, and 10% levels of significance and 1 model at the 10%. Out of the 10 models, 3 models had VWAP20 variable coefficient indicating a positive impact on the time-varying efficiency of those stocks, and 7 variable coefficient sign indicating the opposite.

Category D

Out of the 17 representing this category, 15 models yielded no statistical results for this variable. This left us with 2 models; 1 resulted in statistically significant coefficients for the VWAP20 variable with the right sign implying it had a positive impact on efficiency, and 1 yielded statistically insignificant results.

Categories E, F and G

Category E resulted in 2 models with insignificant results, while categories F and G yielded no statistical results for this variable.

10.3 Order 20

Despite that this reform measure enables investors to freely price stocks up to the price limits of ±20%, it still limits the pricing decision for investors in some instances. The following analysis will be presenting the results pertinent to this variable on the different stocks in each category.

Category A

This variable had statistical results for 25 stocks from the 41 eligible stocks in this category. In other words, this variable had no explanatory powers for the variability of the time-varying efficiency parameter for 18 stocks in this category. Out of the 25, one model yielded results for the variable parameter of levels of statistical significance at 5% and 10% significance levels, the remaining 24 models yielded significant results at all levels

of significance (1%, 5%, and 10%). The variable coefficient sign was negative for 2 of the 24 models, implying that for two cases only was this variable of positive impact on the time-varying AR (1) parameter. The variable coefficient was positive in the remaining 22 models.

Category B

Out of the potential 45 models, 27 only yielded statistical results for this variable. Out of the 27 model, the variable coefficient was insignificant for 5 models, significant at the 5%, and 10% significance level for 1 model, and significant at the 1%, %5, and 10% significance levels for 21 stocks.

From the 22 models of significant variable coefficient, the variable coefficient was with the right sign for 3 cases only, while it yielded the wrong the sign for 19 cases. Implying that having this price limitations had a negative impact on efficiency for more individual stocks than a positive impact.

Category C

From the 31 stock models. 19 yielded statistical results. From the 19 models, 1 variable parameter was significant at the 10% significance level, 1 variable parameter was significant at the 5% and 10% significance levels, 13 models with the variable parameter significant at the 1%, 5%, and 10% significance levels, and 4 models with insignificant variable parameter.

From the 15 models, 2 had variable coefficients with a negative sign, implying that the presence of this variable improved the time-varying efficiency parameter, while had a positive sign for 13 models, implying that this variable reduced specific stock efficiency for those stocks.

Category D

We have in this category 17 stocks, out of which 4 only yielded statistical outcomes, out of which 3 were statistically significant coefficients at the 1%, 5% and 10% significance level and 1 was insignificant. From the 3 statistically significant results, the variable had the right sign in 1 model only and the wrong sign in 2 models.

Category E

We have in this category 22 stocks, 5 models only yielded statistical results for this variable, out of which 4 were statistically significant results at the 1%, 5% and 10% and 1 was insignificant. The variable had the wrong sign for all 4 models with statistically significant results.

Categories F and G

All models yielded no statistical results.

10.4 Order 10

This measure further reduced the price limits from ±20 on the order to ±10 on the order. This reduction in price limits was a decision taken by The EGX management in March 2011 to curb the expected volatility in the market and limit price declines. The following subsections will be presenting the statistical findings of the models with this variable added to the list of explanatory variables.

Category A

This variable is present in the 41 models implemented on the individual stocks constituting this category, and all 41 models yielded statistical results. Out of these 41 models, the variable coefficient was statistically significant at the 1%, 5% and 10% level of significance for 37 models, at the 5% and 10% level of significance for 2 models, and insignificant results for 2 models.

Out of the 37 models with statistically significant results, 9 models resulted in variables coefficients with the right sign implying an improvement in efficiency, however, 28 models resulted in variables coefficients with the wrong sign implying a deterioration in efficiency when this variable is added to the model, and hence implying that this measure adopted by The EGX resulted in a deterioration in market efficiency on the stocks level.

Category B

All 45 stocks models yielded statistical results for this variable. Out of the 45 estimated models, 32 had significant variable parameter at the 1%, 5%, and 10% significance levels,

2 at the 5% and 10% significance levels, 2 at the 10% significance level, and 9 insignificant variable parameters for the 9 stocks model.

Out of the 36 significant variables parameter, 15 models resulted in the right variable sign implying that for 15 stocks, this variable improve the time-varying stock price efficiency, while for the remaining 21 stocks model, the model yielded variables parameters with the wrong sign implying that this variable had a negative impact regarding the time-varying efficiency parameter estimated from the AR (1) model.

Category C

Out of the 33 potential stock models, 29 yielded a statistical output for this variable out of which 24 resulted in statistically significant variables coefficient at the 1%, 5%, and 10% significance levels, and 2 at the 5% and 10% significance levels, and 3 insignificant variable parameter or coefficients.

Out of the 24 significant parameter models, 8 coefficients had the right sign indicating an improvement to the time-varying estimated efficiency parameter, while 18 had the wrong sign.

Category D

From the 17 stock models constituting this category, 15 yielded statistical results and 2 did not. Out of the 15, 14 model resulted in significant coefficient variable at 1%, 5% and

10% significance levels, and 1 model at the 5% and 10% levels. The variable coefficient was of the right sign in 6 models only and the wrong sign for 9 models.

Category E

From the 22 stock models constituting this category, 13 yielded statistical results of which 11 models resulted in significant coefficient variable at 1%, 5% and 10% significance levels, and 2 model resulted in insignificant variables. The variable coefficient was of the right sign in 5 models only and the wrong sign for 6 models.

Category F

In this category, two models only yielded statistical results with 1 of them only significant at the 5% and 10% accompanied with the wrong sign.

Category G

Only 1 model yielded statistical results for the variable coefficient and was significant at the 1%, 5%, and 10% significance levels accompanied with the right sign.

10.5 Same Day Trading (T+0)

This reform measure was with the aim at improving market liquidity and enable investors the freedom of trading on an intra-day basis. We conducted the econometric analysis for all categories and the outcomes are presented in the following subsections.

Category A

All 41 stock models yielded statistical results. Of the 41, 2 resulted in insignificant variable coefficient, 37 significant variable coefficient at the 1%, 5% and 10% significance levels, 1 model with a significant variable at the 5% and 10% levels, and 1 at the 10% significance level. Out of the significant variable models, 7 were with the right sign and 32 with the wrong sign.

Category B

Out of the 45 stock models, 44 yielded statistical results. Of the 44, 4 resulted in insignificant variable coefficient, 39 models with significant variable coefficient at the 1%, 5% and 10% significance levels, 1 model with a significant variable at the 5% and 10% levels. Out of the significant variable models, 5 were with the right sign and 35 with the wrong sign.

Category C

Out of the 33 stock models, 27 yielded statistical results. Of the 27, 10 resulted in insignificant variable coefficient, 15 significant variable coefficient at the 1%, 5% and 10% significance levels, 1 model with a significant variable at the 5% and 10% levels, and 1 at the 10% significance level. Out of the significant variable models, 2 were with the right sign and 15 with the wrong sign.

Category D

Out of the 17 stock models, 12 yielded statistical results. Of the 12, 2 resulted in insignificant variable coefficient, 9 significant variable coefficient at the 1%, 5% and 10%

significance levels, 1 model with a significant variable at the 5% and 10% levels. Out of the significant variable models, 5 were with the right sign and 5 with the wrong sign.

Category E

Out of the 22 stock models, 15 yielded statistical results. Of the 15, 7 resulted in insignificant variable coefficient, 6 significant variable coefficient at the 1%, 5% and 10% significance levels, 1 model with a significant variable at the 5% and 10% levels, and 1 at the 10% significance level. Out of the significant variable models, 1 was with the right sign and 7 with the wrong sign.

Category F

Out of the 11 stock models, 10 yielded statistical results. Of the 10, 3 resulted in insignificant variable coefficient, 6 significant variable coefficient at the 1%, 5% and 10% significance levels, and 1 at the 10% significance level. Out of the significant variable models, 4 were with the right sign and 3 with the wrong sign.

Category G

Out of the 5 stock models, 5 yielded statistical results. Of the 5, 1 resulted in insignificant variable coefficient, 2 significant variable coefficient at the 1%, 5% and 10% significance levels, and 2 at the 5% and 10% significance levels. Out of the significant variable models, 1 was with the right sign and 3 with the wrong sign.

10.6 Omnibus Variable

Category A

All 41 stocks models yielded statistical results. From the 41 models, 21 yielded variable coefficient that is significant at the 1%, 5%, and 10% significance levels, 2 at the 5% and 10%, and 4 at the 10%. The remaining 14 models resulted in insignificant variable coefficients that are insignificant at the traditional significance levels. The findings indicate that 2 only out of the estimated models resulted in a coefficient variable that is of the right sign while the remaining 25 models resulted in coefficient variables of the wrong sign.

Category B

Out of the 45 available models, 44 yielded statistical results. The variable coefficient was insignificant in 24 models and significant in 20. In the 20 significant variable coefficient models, 14 were significant at the 1%, 5% and 10% significance levels, while 3 at the 5% and 10%, and 3 at the 10% only.

It is worthwhile that 8 of the significant variable models yielded the right sign indicating they improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 12 resulted in wrong signs indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category C

Out of the 33 stock models, 30 yielded statistical results. The variable coefficient was insignificant in 16 models and significant in 14. In the 14 significant variable coefficient

models, 9 were significant at the 1%, 5% and 10% significance levels, while 4 at the 5% and 10%, and 1 at the 10% only.

It is worthwhile that 2 only of the significant variable models yielded the right sign indicating they improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 12 resulted in wrong signs indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category D

Out of the 17 stock models, 14 yielded statistical results. The variable coefficient was insignificant in 10 models and significant in 4. In the 4 significant variable coefficient models, 3 were significant at the 5% and 10% significance levels, while 1 only at the 10%.

It is worthwhile that 1 only of the significant variable models yielded the right sign indicating they improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 3 resulted in wrong signs indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category E

Out of the 22 stock models, 10 yielded statistical results. The variable coefficient was insignificant in 5 models and significant in 5. In the 5 significant variable coefficient

models, 2 were significant at the 1%, 5% and 10% significance levels, while 1 at the 5% and 10%, and 2 at the 10% only.

It is worthwhile that 2 only of the significant variable models yielded the right sign indicating they improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 3 resulted in wrong signs indicating no-improvement or a negative impact on the time-varying efficiency parameter.

Category F

Out of the 11 stock models, 9 yielded statistical results. The variable coefficient was insignificant in 6 models and significant in 3. In the 3 significant variable coefficient models, the 3 were significant at the 1%, 5% and 10% significance levels having 1 with the right sign indicating they improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 2 resulted in wrong signs indicating no-improvement or a negative impact on the time-varying efficiency parameter

Category G

Out of the 5 stock models, 4 yielded statistical results. The variable coefficient was insignificant in 2 models and significant in 2 at the 1%, 5% and 10% significance levels having 1 with the right sign indicating they improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining model resulted in wrong signs indicating no-improvement or a negative impact on the time-varying efficiency parameter

10.7 FF Percent Variable

This variable is one of the most important variables to assess its impact against the time-varying stock efficiency variable. We conducted the analysis by applying the techniques mentioned earlier from estimating the time-varying parameter in the AR(1) model using state space modelling, and then regressing the estimated time varying parameter against the set of variables described earlier including the free float percent variable. The following subsections will summarize the main findings pertinent to this variable. This variable is a proxy for the reform pertinent to setting a minimum threshold for companies to have a free float in the stock market.

Category A

All 41 stocks yielded statistical results implying there has a been a change in the free floated shares of the companies at any point of time and hence the variable had explanatory powers of the estimated time-varying efficiency parameter. The variable coefficient was insignificant in 4 models only and significant in 37 models. In the 37 significant variable coefficient models, 36 were significant at the 1%, 5% and 10% significance levels, while 1 at the 5% and 10% significance levels.

It is worthwhile that 12 of the significant variable models yielded the right sign indicating they improved the time-varying efficiency variable estimated from the AR(1) model, while

the remaining 25 resulted in a wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category B

All 45 stock models in this category yielded statistical results. The variable coefficient was insignificant in 4 models and significant in 41. In the 41 significant variable coefficient models, 40 were significant at the1%, 5% and 10% significance levels, while 1 only at the 5% and 10%.

It is worthwhile that 21 of the significant variable models yielded the right sign indicating that larger free float improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 20 resulted in wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category C

All 33 stock models in this category yielded statistical results. The variable coefficient was insignificant in 1 model and significant in 32. In the 32 significant variable coefficient models, 31 were significant at the1%, 5% and 10% significance levels, while 1 only at the 5% and 10%.

It is worthwhile that 15 of the significant variable models yielded the right sign indicating that larger free float improved the time-varying efficiency variable estimated from the

AR(1) model, while the remaining 17 resulted in wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category D

All 17 stock models in this category yielded statistical results. The variable coefficient was insignificant in 2 models and significant in 15 with significance at the1%, 5% and 10% significance levels.

It is worthwhile that 8 of the significant variable models yielded the right sign indicating that larger free float improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 7 resulted in wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category E

In this category, 21 stock models yielded statistical results from the available 22. The variable coefficient was insignificant in 3 models and significant in 18. In the 18 significant variable coefficient models, 17 were significant at the1%, 5% and 10% significance levels, while 1 only at the 10% significance level.

It is worthwhile that 10 of the significant variable models yielded the right sign indicating that larger free float improved the time-varying efficiency variable estimated from the

AR(1) model, while the remaining 8 resulted in wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category F

All 11 stock models in this category yielded statistical results. The variable coefficient was insignificant in 3 models and significant in 8. In the 8 significant variable coefficient models, 7 were significant at the1%, 5% and 10% significance levels, while 1 only at the 5% and 10% significance level.

It is worth mentioning that 6 of the significant variable models yielded the right sign indicating that larger free float improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 2 resulted in wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category G

All 5 stock models in this category yielded significant statistical results at the1%, 5% and 10% significance levels, out of which 3 of the significant variable models yielded the right sign indicating that larger free float improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 2 resulted in wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

10.8 Fix (Online) Trading Percent Variable

This proxy variable represents the introduction of online trading that accompanied the introduction of what is technologically known as the FIX protocol by The EGX. Additionally, EFSA issued the regulatory framework for licensing brokerage companies to introduce online trading for investors. The following subsections will be presenting the estimation models outcomes regarding this variable.

Category A

Out of the 41 stocks models constituting this category, 17 stock models yielded statistical results. The variable coefficient was insignificant in 2 models and significant in 15. In the 15 significant variable coefficient models, 12 were significant at the1%, 5% and 10% significance levels, 2 models significant at the 5% and 10%, while 1 only at the 10% significance levels.

It is worth mentioning that 8 of the significant variable models yielded the right sign indicating that higher FIX (online) trading percentage improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 7 resulted in the wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category B

Out of the 45 stocks models constituting this category, 27 stock models yielded statistical results. The variable coefficient was insignificant in 3 models and significant in 24. In the

24 significant variable coefficient models, 23 were significant at the1%, 5% and 10% significance levels, while 1 only at the 10% significance levels.

It is worth mentioning that 12 of the significant variable models yielded the right sign indicating that higher FIX (online) trading percentage improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 12 resulted in the wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category C

Out of the 33 stocks models constituting this category, 18 stock models yielded statistical results. The variable coefficient was insignificant in 3 models and significant in 15. In the 15 significant variable coefficient models, 14 were significant at the 1%, 5% and 10% significance levels, while 1 only at the 5% and 10% significance levels.

It is worth mentioning that 10 of the significant variable models yielded the right sign indicating higher online trading percentage improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 5 models resulted in the wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category D

Out of the 17 stocks models constituting this category, 8 stock models yielded statistical results whereby all of them were significant at the 1%, 5% and 10% significance levels and 7 of the 8 models yielded the right sign indicating that higher online trading percentage improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 5 models resulted in the wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category E

Out of the 22 stocks models constituting this category, 7 stock models yielded statistical results whereby 6 of them were significant at the 1%, 5% and 10% significance levels with 5 of them resulting in the right sign for the variable coefficient indicating that higher online trading percentage improved the time-varying efficiency variable estimated from the AR(1) model, while the remaining 5 models resulted in the wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category F

Out of the 11 stocks models constituting this category, 8 stock models yielded statistical results. The variable coefficient was insignificant in 4 models and significant in 4. In the 4 significant variable coefficient models, 2 were significant at the 1%, 5% and 10% significance levels, while 1 at the 5% and 10% and 1 at the 10% significance levels.

It is worth mentioning that 2 of the significant variable models yielded the right sign indicating higher online trading percentage improved the time-varying efficiency variable

estimated from the AR(1) model, while the remaining 2 models resulted in the wrong sign indicating no-improvement or a deteriorating impact on the time-varying efficiency parameter.

Category G

Out of the 5 stocks models constituting this category, 3 stock models yielded statistical results whereby all of them were significant at the 1%, 5% and 10% significance levels with 2 of them resulting in the right sign for the variable coefficient, while 1 model resulted in the wrong sign.

10.9 Foreign Institutions Trading Percent Variable

Foreign institutions trading percentage variable is a proxy variable to assess to what extent the listing and disclosure rules entice investors to trade in the Egyptian market, especially after the issuance of the listing, delisting and disclosure rules by the CMA Board in 2002 and its updates. It is worthy of mention that this variable proxy could be assessing also the extent of the market depth, however, this should have been captured by the free float percentage proxy variable incorporated in the estimation models that should have captured the market depth impact on time-varying efficiency. The following subsections will be presenting the findings pertinent to each category.

Category A

Out of the 41 stocks models constituting this category, 28 stock models yielded statistical results. The variable coefficient was insignificant in 6 models and significant in 22. In the 22 significant variable coefficient models, 16 were significant at the1%, 5% and 10% significance levels, 4 models significant at the 5% and 10%, while 2 at the 10% significance level. It is worthy of mention that 14 of the significant variable models yielded the right sign, while the remaining 8 resulted in the wrong sign.

Category B

Out of the 45 stocks models constituting this category, 30 stock models yielded statistical results. The variable coefficient was insignificant in 12 models and significant in 18. In the 18 significant variable coefficient models, 9 were significant at the1%, 5% and 10% significance levels, 5 models significant at the 5% and 10%, while 4 at the 10% significance level. It is worthy of mention that 11 of the significant variable models yielded the right sign, while the remaining 7 resulted in the wrong sign.

Category C

Out of the 33 stocks models constituting this category, 19 stock models yielded statistical results. The variable coefficient was insignificant in 8 models and significant in 11. In the 11 significant variable coefficient models, 8 were significant at the1%, 5% and 10% significance levels, 3 models significant at the 5% and 10%, while no models at the 10% significance level. It is worthy of mention that 6 of the significant variable models yielded the right sign, while the remaining 5 resulted in the wrong sign.

Category D

Out of the 17 stocks models constituting this category, 14 stock models yielded statistical results. The variable coefficient was insignificant in 2 models and significant in 12. In the 12 significant variable coefficient models, 8 were significant at the1%, 5% and 10% significance levels, 2 models significant at the 5% and 10%, while 2 at the 10% significance level. It is worthy of mention that 8 of the significant variable models yielded the right sign, while the remaining 4 resulted in the wrong sign.

Category E

Out of the 22 stocks models constituting this category, 14 stock models yielded statistical results. The variable coefficient was insignificant in 5 models and significant in 9. In the 9 significant variable coefficient models, 7 were significant at the1%, 5% and 10% significance levels, 1 model significant at the 5% and 10%, while 1 at the 10% significance level. It is worthy of mention that 6 of the significant variable models yielded the right sign, while the remaining 3 resulted in the wrong sign.

Category F

Out of the 11 stocks models constituting this category, 10 stock models yielded statistical results. The variable coefficient was insignificant in 4 models and significant in 6. The 6 significant variable coefficient models were significant at the1%, 5% and 10% significance levels with the right sign.

Category G

Out of the 5 stocks models constituting this category, 1 stock model yielded insignificant statistical results for the variable proxy.

10.10 Egyptian Institutions Trading Percent Variable

This variable represents the percentage of Egyptian institutions value trading as percent of total trading per stock. This is proxy variable should be reflecting the impact of the funds regulatory framework and any other reform measure that aims at facilitating the establishment of new funds in the market and facilitating the trading of asset managers. The following subsections will be presenting the findings for category.

Category A

Out of the 41 stocks models constituting this category, 30 stock models yielded statistical results for this variable. The variable coefficient was insignificant in 8 models and significant in 22. In the 22 significant variable coefficient models, 18 were significant at the 1%, 5% and 10% significance levels, 4 models significant at the 5% and 10%. It is worthy of mention that 17 of the significant variable models yielded the right sign, while the remaining 5 resulted in the wrong sign.

Category B

Out of the 45 stocks models constituting this category, 36 stock models yielded statistical results for this variable. The variable coefficient was insignificant in 13 models and

significant in 23. In the 23 significant variable coefficient models, 15 were significant at the 1%, 5% and 10% significance levels, 4 models with a variable coefficient significant at the 5% and 10%, and 4 models with a variable coefficient that is significant at the 10%. It is worthy of mention that 12 of the significant variable models yielded the right sign, while the remaining 11 resulted in the wrong sign.

Category C

Out of the 33 stocks models constituting this category, 27 stock models yielded statistical results for this variable. The variable coefficient was insignificant in 16 models and significant in 11 all with the variable significant at 1%, 5% and 10% significance levels. It is worthy of mention that 6 of the significant variable models yielded the right sign, while the remaining 5 resulted in the wrong sign.

Category D

Out of the 17 stocks models constituting this category, 11 stock models yielded statistical results for this variable. The variable coefficient was insignificant in 2 models and significant in 9. In the 9 significant variable coefficient models, 3 were significant at the 1%, 5% and 10% significance levels, and 6 models with a variable coefficient significant at the 5% and 10%. It is worthy of mention that 6 of the significant variable models yielded the right sign, while the remaining 3 resulted in the wrong sign.

Category E

Out of the 22 stocks models constituting this category, 17 stock models yielded statistical results for this variable. The variable coefficient was insignificant in 8 models and significant in 9. In the 9 significant variable coefficient models, 7 were significant at the 1%, 5% and 10% significance levels, 1 model with a variable coefficient significant at the 5% and 10%, and 1 model with a variable coefficient that is significant at the 10%. It is worthy of mention that 8 of the significant variable models yielded the right sign, while the remaining 1 resulted in the wrong sign.

Category F

Out of the 11 stocks models constituting this category, 8 stock models yielded statistical results for this variable. The variable coefficient was insignificant in 4 models and significant in 4. In the 4 significant variable coefficient models, 2 were significant at the 1%, 5% and 10% significance levels and 2 models with a variable coefficient that is significant at the 10%. It is worthy of mention that the 4 significant variable models yielded the right sign.

Category G

The 5 stocks models constituting this category yielded statistical results for this variable. The variable coefficient was insignificant in 3 models and significant in 2 at the 1%, 5% and 10% significance levels with 1 yielding the right sign and 1 the wrong sign.

11. Annex (3): Individual Stocks Regressions per Category

Table 11.1: Category A Regressions Summary

Company Name	Coefficient	Std.Error	t-value	t-prob	Standardized Coefficients
Al Baraka Bank Egypt					
FF_PERC	-1.7551	0.06306	-27.8	0	-0.693438026
EGP_RETAIL_EGP_VALUE_PERC	-0.166394	0.02286	-7.28	0	-0.254862561
EGP_INSTIT_EGP_VALUE_PERC	-0.185686	0.02625	-7.07	0.00000	-0.213650996
FOR_INSTIT_EGP_VALUE_PERC	-0.16365	0.02754	-5.94	0	-0.144964515
EGP_VALUE_FIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
Constant	0.305552	0.02649	11.5	0.00000	
EGP_VALUE_T0_PERC	0.080522	0.04969	1.62	0.1052	0.029270608
DS_TOP_PERC	1.00205	0.34	2.95	0.00320	0.039780432
EGP_VALUE_OMNIBUS_PERC	0.120245	0.03903	3.08	0.0021	0.045145117
EGP_VALUE_NOFIX_PERC	0.0297838	0.01085	2.75	0.0061	0.066802375
ORDER20	0.334234	0.01072	31.2	0	0.823890477
ORDER10	0.272565	0.01099	24.8	0	0.962141001
Ezz Steel					
VWAP20	-0.124858	0.005863	-21.3	0.00000	-0.60647141
FF_PERC	-0.189431	0.02294	-8.26	0	-0.142398515
EGP_VALUE_FIX_PERC	-0.0433514	0.0121	-3.58	0.0003	-0.109644789
EGP_VALUE_T0_PERC	-0.0948428	0.02205	-4.3	0	-0.077666534
EGP_VALUE_NOFIX_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.161642	0.01557	10.4	0.00000	
ORDER20	0	0			0
DS_TOP_PERC	0.348156	0.2086	1.67	0.09510	0.021869174
ORDER10	0.0138133	0.006572	2.1	0.0356	0.068544601
EGP_VALUE_OMNIBUS_PERC	0.212238	0.03457	6.14	0	0.08887834
FOR_RETAIL_EGP_VALUE_PERC	0.122621	0.0212	5.79	0	0.096210964
FOR_INSTIT_EGP_VALUE_PERC	0.0599508	0.01509	3.97	0.0001	0.099920992
EGP_RETAIL_EGP_VALUE_PERC	0.174621	0.01332	13.1	0	0.366420958
Global Telecom Holding					
VWAP20	-0.0511699	0.002172	-23.6	0.00000	-0.286150522
EGP_RETAIL_EGP_VALUE_PERC	-0.0356973	0.004581	-7.79	0	-0.078724452
FOR_RETAIL_EGP_VALUE_PERC	-0.0165607	0.007119	-2.33	0.02	-0.013907177
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.128853	0.004479	28.8	0.00000	

EGP_INSTIT_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.0704863	0.04183	1.69	0.09200	0.007861768
FF_PERC	0.00692426	0.002993	2.31	0.0207	0.013430861
FOR_INSTIT_EGP_VALUE_PERC	0.0132045	0.004834	2.73	0.0063	0.02686466
EGP_VALUE_OMNIBUS_PERC	0.128239	0.0124	10.3	0	0.050865532
EGP_VALUE_FIX_PERC	0.0471218	0.004233	11.1	0	0.1423519
ORDER20	0.0477158	0.002645	18	0	0.184200752
EGP_VALUE_T0_PERC	0.201609	0.006022	33.5	0	0.255186107
ORDER10	0.075328	0.002863	26.3	0	0.431957474
Egypt Aluminum					
VWAP20	-0.516461	0.01825	-28.3	0.00000	-0.415925978
ORDER10	-0.100139	0.00997	-10	0	-0.23626076
EGP_INSTIT_EGP_VALUE_PERC	-0.213905	0.05767	-3.71	0.00020	-0.150417768
EGP_VALUE_NOFIX_PERC	-0.0745785	0.0165	-4.52	0	-0.102551952
EGP_RETAIL_EGP_VALUE_PERC	-0.121444	0.05413	-2.24	0.0249	-0.09856265
FOR_RETAIL_EGP_VALUE_PERC	-0.0651305	0.06439	-1.01	0.3118	-0.023850557
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
Constant	0.21946	0.05589	3.93	0.00010	
DS_TOP_PERC	1.39997	0.5115	2.74	0.00620	0.035183406
EGP_VALUE_OMNIBUS_PERC	0.248607	0.08814	2.82	0.0048	0.037967677
FF_PERC	0.653451	0.1309	4.99	0	0.101749368
EGP_VALUE_T0_PERC	1.61896	0.07037	23	0	0.328124956
Egyptian for Tourism Resorts					
FF_PERC	-0.215943	0.01362	-15.9	0	-0.426037032
EGP_VALUE_FIX_PERC	-0.0531772	0.0133	-4	0.0001	-0.136438782
EGP_VALUE_OMNIBUS_PERC	-0.235027	0.06777	-3.47	0.0005	-0.049646088
Constant	-0.166014	0.02124	-7.81	0.00000	
VWAP20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.155717	0.1823	0.854	0.39290	0.011793641
ORDER20	0.0132966	0.006659	2	0.0459	0.048139039
EGP_VALUE_T0_PERC	0.166368	0.02067	8.05	0	0.145387116
FOR_RETAIL_EGP_VALUE_PERC	0.35676	0.02957	12.1	0	0.257534882
EGP_INSTIT_EGP_VALUE_PERC	0.414556	0.02604	15.9	0.00000	0.370122305
EGP_RETAIL_EGP_VALUE_PERC	0.408016	0.02097	19.5	0	0.547305553
ORDER10	0.153486	0.008149	18.8	0	0.756780052
Canal Shipping Agencies					
EGP_RETAIL_EGP_VALUE_PERC	-0.0877042	0.01246	-7.04	0	-0.084143325

EGP_INSTIT_EGP_VALUE_PERC	-0.10548	0.01603	-6.58	0.00000	-0.061223152
FOR_RETAIL_EGP_VALUE_PERC	-0.096336	0.01578	-6.11	0	-0.057811487
VWAP20	-0.0118716	0.002365	-5.02	0.00000	-0.053770398
EGP_VALUE_NOFIX_PERC	-0.0108382	0.004336	-2.5	0.0125	-0.035141483
EGP_VALUE_T0_PERC	-0.0366596	0.007583	-4.83	0	-0.033505642
DS_TOP_PERC	-0.0818985	0.1069	-0.766	0.44350	-0.004089243
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
Constant	0.172406	0.0134	12.9	0.00000	
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.143523	0.03593	3.99	0.0001	0.022500426
ORDER10	0.0555806	0.002252	24.7	0	0.301433069
FF_PERC	2.02373	0.04067	49.8	0	0.426113452
El Ezz Porcelain (Gemma)					
VWAP20	-0.0154837	0.008517	-1.82	0.06920	-0.071031275
EGP_VALUE_T0_PERC	-0.073603	0.02473	-2.98	0.0029	-0.038620796
EGP_VALUE_FIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	-0.359482	0.0246	-14.6	0.00000	
DS_TOP_PERC	0.380999	0.4225	0.902	0.36720	0.0113921
EGP_VALUE_OMNIBUS_PERC	0.0977221	0.045	2.17	0.0299	0.031568527
FOR_INSTIT_EGP_VALUE_PERC	0.201669	0.03124	6.46	0	0.103143711
EGP_VALUE_NOFIX_PERC	0.040921	0.00929	4.4	0	0.120140505
EGP_RETAIL_EGP_VALUE_PERC	0.121588	0.01886	6.45	0	0.147471316
EGP_INSTIT_EGP_VALUE_PERC	0.189507	0.02644	7.17	0.00000	0.158100493
FF_PERC	0.763693	0.04708	16.2	0	0.221648987
ORDER10	0.0941412	0.01014	9.29	0	0.441266744
ORDER20	0.149331	0.009342	16	0	0.472279437
Sidi Kerir Petrochemicals					
VWAP20	-0.118604	0.005605	-21.2	0.00000	-0.46747345
ORDER10	-0.065312	0.005619	-11.6	0	-0.319610104
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.0628772	0.009868	6.37	0.00000	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.22045	0.2508	0.879	0.37940	0.012081129
FOR_RETAIL_EGP_VALUE_PERC	0.0253578	0.01823	1.39	0.1644	0.023750837
EGP_VALUE_OMNIBUS_PERC	0.0418459	0.02177	1.92	0.0547	0.02980067
FOR_INSTIT_EGP_VALUE_PERC	0.0341015	0.01163	2.93	0.0034	0.061106223
EGP_RETAIL_EGP_VALUE_PERC	0.0383551	0.01067	3.59	0.0003	0.07929109
EGP_VALUE_FIX_PERC	0.0606678	0.0103	5.89	0	0.155359401
EGP_VALUE_T0_PERC	0.3213	0.02797	11.5	0	0.193341986

FF_PERC	0.192042	0.01659	11.6	0	0.239370013

Samad Misr -EGYFERT					
EGP_RETAIL_EGP_VALUE_PERC	-0.184964	0.0452	-4.09	0	-0.135450428
FF_PERC	-0.0981813	0.01239	-7.93	0	-0.130434726
EGP_INSTIT_EGP_VALUE_PERC	-0.183965	0.05258	-3.5	0.00050	-0.088719369
EGP_VALUE_NOFIX_PERC	-0.0321264	0.009689	-3.32	0.0009	-0.085507168
FOR_RETAIL_EGP_VALUE_PERC	-0.113665	0.05357	-2.12	0.0339	-0.052325629
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.0364238	0.05051	0.721	0.47090	
DS_TOP_PERC	0.420146	0.2661	1.58	0.11440	0.019347117
EGP_VALUE_OMNIBUS_PERC	0.265712	0.131	2.03	0.0426	0.02565277
EGP_VALUE_T0_PERC	0.141709	0.05644	2.51	0.0121	0.049015345
ORDER20	0.410749	0.01072	38.3	0	1.263825246
ORDER10	0.359494	0.01026	35	0	1.563624185

Mena Touristic & Real Estate Investment					
FF_PERC	-0.162585	0.006421	-25.3	0	-0.471396831
VWAP20	-0.0529998	0.005317	-9.97	0.00000	-0.167806366
EGP_VALUE_NOFIX_PERC	-0.0386883	0.008406	-4.6	0	-0.136300316
FOR_RETAIL_EGP_VALUE_PERC	-0.0193085	0.01677	-1.15	0.2496	-0.019451765
DS_TOP_PERC	-0.105022	0.1567	-0.67	0.50290	-0.007792812
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
Constant	0.156035	0.0151	10.3	0.00000	
FOR_INSTIT_EGP_VALUE_PERC	0.0404441	0.02065	1.96	0.0503	0.029610931
EGP_VALUE_OMNIBUS_PERC	0.230568	0.05454	4.23	0	0.051219984
EGP_RETAIL_EGP_VALUE_PERC	0.0505722	0.01251	4.04	0.0001	0.07915852
EGP_VALUE_T0_PERC	0.240541	0.02541	9.47	0	0.179887556
ORDER10	0.0714666	0.005719	12.5	0	0.419434997

Arab Cotton Ginning					
EGP_VALUE_FIX_PERC	-0.0220422	0.004294	-5.13	0	-0.061958373
FF_PERC	-0.0131224	0.003471	-3.78	0.0002	-0.023822799
DS_TOP_PERC	-0.188954	0.05467	-3.46	0.00060	-0.014346258
EGP_RETAIL_EGP_VALUE_PERC	-0.0146168	0.007422	-1.97	0.049	-0.013803576
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.0310512	0.008763	3.54	0.00040	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0.00304223	0.01174	0.259	0.7955	0.001465051

EGP_VALUE_OMNIBUS_PERC	0.0665966	0.02288	2.91	0.0036	0.012745606
FOR_INSTIT_EGP_VALUE_PERC	0.0695924	0.01007	6.91	0	0.041394155
EGP_VALUE_T0_PERC	0.140343	0.008147	17.2	0	0.105613305
VWAP20	0.072062	0.005029	14.3	0.00000	0.338109041
ORDER20	0.188895	0.00524	36	0	0.684971121
ORDER10	0.279512	0.005441	51.4	0	1.435600289
Heliopolis Housing					
EGP_RETAIL_EGP_VALUE_PERC	-0.1009	0.01211	-8.33	0	-0.155606899
EGP_VALUE_NOFIX_PERC	-0.0550302	0.007005	-7.86	0	-0.097977903
EGP_INSTIT_EGP_VALUE_PERC	-0.0734497	0.01321	-5.56	0.00000	-0.091126156
FOR_INSTIT_EGP_VALUE_PERC	-0.0245183	0.0145	-1.69	0.091	-0.020643139
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.108129	0.01932	-5.6	0.00000	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.0711341	0.1926	0.369	0.71190	0.002437376
EGP_VALUE_OMNIBUS_PERC	0.0439896	0.02454	1.79	0.0732	0.012464832
EGP_VALUE_T0_PERC	0.104139	0.01344	7.75	0	0.062795916
FF_PERC	0.378671	0.05226	7.25	0	0.147104772
VWAP20	0.263632	0.01001	26.3	0.00000	0.718433902
ORDER20	0.327907	0.01049	31.3	0	0.885266544
ORDER10	0.359929	0.01124	32	0	1.381286968
ELSWEDY ELECTRIC					
EGP_VALUE_NOFIX_PERC	-0.0986248	0.01008	-9.79	0	-0.193840762
EGP_RETAIL_EGP_VALUE_PERC	-0.0646827	0.01237	-5.23	0	-0.104578526
FOR_INSTIT_EGP_VALUE_PERC	-0.0317125	0.01194	-2.66	0.008	-0.0532121
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.114265	0.03101	-3.68	0.00020	
VWAP20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0.00597601	0.0233	0.256	0.7976	0.003948041
DS_TOP_PERC	0.611592	0.3776	1.62	0.10540	0.022524592
EGP_VALUE_OMNIBUS_PERC	0.0815479	0.02785	2.93	0.0034	0.043818144
ORDER20	0.0640916	0.007786	8.23	0	0.179934583
EGP_VALUE_T0_PERC	0.477541	0.04258	11.2	0	0.188838363
FF_PERC	0.627493	0.07903	7.94	0	0.219533825
ORDER10	0.124656	0.007693	16.2	0	0.437126771
Suez Canal Bank					
FF_PERC	-0.598224	0.05611	-10.7	0	-0.213491105
EGP_RETAIL_EGP_VALUE_PERC	-0.20447	0.03019	-6.77	0	-0.182929523
EGP_INSTIT_EGP_VALUE_PERC	-0.219123	0.03466	-6.32	0.00000	-0.154174346
FOR_INSTIT_EGP_VALUE_PERC	-0.340104	0.0439	-7.75	0	-0.136419204

EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.115226	0.03525	3.27	0.00110	
EGP_VALUE_OMNIBUS_PERC	0.0592131	0.1424	0.416	0.6776	0.005376348
DS_TOP_PERC	0.839469	0.7716	1.09	0.27670	0.013923433
VWAP20	0.0430282	0.01939	2.22	0.02660	0.049630531
EGP_VALUE_FIX_PERC	0.0600866	0.01433	4.19	0	0.093193704
EGP_VALUE_T0_PERC	0.572754	0.05354	10.7	0	0.143996854
ORDER20	0.142829	0.01873	7.63	0	0.254033383
ORDER10	0.173894	0.01949	8.92	0	0.460760762
Sinai Cement					
EGP_INSTIT_EGP_VALUE_PERC	-0.28828	0.09926	-2.9	0.00370	-0.36853544
VWAP20	-0.129002	0.008451	-15.3	0.00000	-0.360555557
ORDER10	-0.0776444	0.008892	-8.73	0	-0.225711772
EGP_RETAIL_EGP_VALUE_PERC	-0.150633	0.09927	-1.52	0.1292	-0.192092199
EGP_VALUE_FIX_PERC	-0.110866	0.01485	-7.47	0	-0.161719104
FF_PERC	-0.0614604	0.01678	-3.66	0.0003	-0.058278128
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
Constant	0.314537	0.09971	3.15	0.00160	
DS_TOP_PERC	0.295961	0.7218	0.41	0.68180	0.005865582
FOR_INSTIT_EGP_VALUE_PERC	0.174623	0.1304	1.34	0.1805	0.033320137
EGP_VALUE_OMNIBUS_PERC	0.430907	0.07814	5.51	0	0.080995212
EGP_VALUE_T0_PERC	2.25028	0.2335	9.64	0	0.13886944
El Shams Housing & Urbanization					
VWAP20	-0.0558246	0.0052	-10.7	0.00000	-0.156005284
EGP_INSTIT_EGP_VALUE_PERC	-0.284081	0.07334	-3.87	0.00010	-0.119766946
EGP_RETAIL_EGP_VALUE_PERC	-0.106262	0.06859	-1.55	0.1214	-0.059212747
FOR_RETAIL_EGP_VALUE_PERC	-0.0682979	0.07619	-0.896	0.3701	-0.023205224
EGP_VALUE_OMNIBUS_PERC	-0.172905	0.1638	-1.06	0.2913	-0.011537241
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	-0.3328	0.07172	-4.64	0.00000	
EGP_VALUE_FIX_PERC	0	0			0
DS_TOP_PERC	0.299296	0.2661	1.12	0.26070	0.012120783
EGP_VALUE_T0_PERC	0.168521	0.02944	5.72	0	0.073145129
ORDER10	0.0483131	0.0159	3.04	0.0024	0.159078373
ORDER20	0.0913242	0.009613	9.5	0	0.202149923
EGP_VALUE_NOFIX_PERC	0.169489	0.01603	10.6	0	0.328134308
FF_PERC	2.02563	0.1173	17.3	0	0.699190071
Middle Egypt Flour Mills					

EGP_INSTIT_EGP_VALUE_PERC	-0.0635905	0.02805	-2.27	0.02350	-0.054530674
EGP_RETAIL_EGP_VALUE_PERC	-0.024067	0.02531	-0.951	0.3417	-0.023232342
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.283124	0.02953	-9.59	0.00000	
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.234273	0.388	0.604	0.54600	0.006449547
FOR_INSTIT_EGP_VALUE_PERC	0.0676492	0.04664	1.45	0.147	0.018023262
EGP_VALUE_OMNIBUS_PERC	0.25021	0.05407	4.63	0	0.05163863
EGP_VALUE_T0_PERC	0.142159	0.04014	3.54	0.0004	0.057474168
EGP_VALUE_NOFIX_PERC	0.0448131	0.01179	3.8	0.0001	0.084463848
ORDER20	0.085929	0.0118	7.28	0	0.179477623
ORDER10	0.0613257	0.01146	5.35	0	0.194542891
FF_PERC	1.32375	0.05792	22.9	0	0.404254064
Orascom Development Egypt					
FOR_INSTIT_EGP_VALUE_PERC	-0.253042	0.02591	-9.77	0	-0.286748322
FF_PERC	-0.0333127	0.0402	-0.829	0.4073	-0.022801817
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.171485	0.02843	-6.03	0.00000	
ORDER20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.174746	0.3926	0.445	0.65630	0.006471894
FOR_RETAIL_EGP_VALUE_PERC	0.0628385	0.03704	1.7	0.0899	0.03044636
EGP_VALUE_NOFIX_PERC	0.0464032	0.02006	2.31	0.0208	0.083046631
EGP_VALUE_OMNIBUS_PERC	0.384097	0.06369	6.03	0	0.097456264
EGP_VALUE_T0_PERC	0.314937	0.05505	5.72	0	0.099287719
VWAP20	0.101752	0.01435	7.09	0.00000	0.296679687
EGP_RETAIL_EGP_VALUE_PERC	0.212712	0.02103	10.1	0	0.330245226
ORDER10	0.128357	0.01278	10	0	0.362098111
South Valley Cement					
VWAP20	-0.0266861	0.007253	-3.68	0.00020	-0.075927748
DS_TOP_PERC	-0.141586	0.341	-0.415	0.67800	-0.005889001
EGP_VALUE_FIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	-0.233855	0.04001	-5.84	0.00000	
EGP_VALUE_T0_PERC	0.0200301	0.0276	0.726	0.4681	0.014148754
EGP_VALUE_OMNIBUS_PERC	0.0923953	0.05627	1.64	0.1007	0.025046732
EGP_INSTIT_EGP_VALUE_PERC	0.0956245	0.03936	2.43	0.01520	0.095191111
FOR_INSTIT_EGP_VALUE_PERC	0.226669	0.04134	5.48	0	0.149511839
FF_PERC	0.158153	0.0339	4.66	0	0.199564576
EGP_VALUE_NOFIX_PERC	0.115728	0.01611	7.18	0	0.240098693
EGP_RETAIL_EGP_VALUE_PERC	0.201841	0.03619	5.58	0	0.242718909

ORDER20	0.133443	0.008998	14.8	0	0.35884614
ORDER10	0.118728	0.01315	9.03	0	0.448450639

North Cairo Mills					
VWAP20	-0.065159	0.001751	-37.2	0.00000	-0.349210316
EGP_RETAIL_EGP_VALUE_PERC	-0.0296889	0.004638	-6.4	0	-0.070610737
EGP_VALUE_OMNIBUS_PERC	-0.0245432	0.006466	-3.8	0.0001	-0.017212806
EGP_INSTIT_EGP_VALUE_PERC	-0.00463508	0.005062	-0.916	0.35990	-0.009600696
FOR_INSTIT_EGP_VALUE_PERC	-0.00533616	0.006922	-0.771	0.4408	-0.004480407
DS_TOP_PERC	-0.0546722	0.07832	-0.698	0.48520	-0.002970977
ORDER20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.0587981	0.005143	11.4	0.00000	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_T0_PERC	0.113059	0.02248	5.03	0	0.02181208
FF_PERC	0.0680161	0.005767	11.8	0	0.102465775
EGP_VALUE_FIX_PERC	0.0387188	0.00198	19.6	0	0.145568463
ORDER10	0.0440945	0.001127	39.1	0	0.297396952

El Nasr Clothes & Textiles (Kabo)					
EGP_VALUE_T0_PERC	-0.385407	0.03565	-10.8	0	-0.192519373
FOR_RETAIL_EGP_VALUE_PERC	-0.454121	0.07328	-6.2	0	-0.177803417
EGP_RETAIL_EGP_VALUE_PERC	-0.191829	0.06637	-2.89	0.0039	-0.120335009
FF_PERC	-0.142616	0.02467	-5.78	0	-0.083679955
EGP_INSTIT_EGP_VALUE_PERC	-0.169144	0.07104	-2.38	0.01730	-0.081868916
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.0570695	0.06962	-0.82	0.41240	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.151987	0.2477	0.614	0.5395	0.007896962
DS_TOP_PERC	0.267214	0.3439	0.777	0.43730	0.009940115
EGP_VALUE_NOFIX_PERC	0.172181	0.01963	8.77	0	0.295953728
VWAP20	0.253305	0.009236	27.4	0.00000	0.624717177
ORDER20	0.452541	0.013	34.8	0	0.905601926
ORDER10	0.453249	0.01463	31	0	1.289153931

Natural Gas & Mining Project (Egypt Gas)					
ORDER10	-0.508699	0.04277	-11.9	0	-1.0464009
VWAP20	-0.498259	0.04185	-11.9	0.00000	-0.77671281
ORDER20	-0.316389	0.04264	-7.42	0	-0.452445165
EGP_RETAIL_EGP_VALUE_PERC	-0.325704	0.2085	-1.56	0.1184	-0.310070468
EGP_INSTIT_EGP_VALUE_PERC	-0.340398	0.2094	-1.63	0.10420	-0.257327495
FOR_INSTIT_EGP_VALUE_PERC	-0.424795	0.2105	-2.02	0.0436	-0.198073527
FOR_RETAIL_EGP_VALUE_PERC	-0.176677	0.2116	-0.835	0.4038	-0.065815917
EGP_VALUE_NOFIX_PERC	-0.0363367	0.0193	-1.88	0.0598	-0.045995817

Constant	-0.0898035	0.2195	-0.409	0.68250	
EGP_VALUE_FIX_PERC	0	0			0
DS_TOP_PERC	3.75733	1.103	3.41	0.00070	0.047428903
EGP_VALUE_T0_PERC	0.963433	0.1377	7	0	0.100695111
EGP_VALUE_OMNIBUS_PERC	0.775566	0.08333	9.31	0	0.1350329
FF_PERC	4.75606	0.2455	19.4	0	0.328530874

Telecom Egypt					
FOR_RETAIL_EGP_VALUE_PERC	-0.0803609	0.007792	-10.3	0	-0.06478526
FOR_INSTIT_EGP_VALUE_PERC	-0.0260591	0.004697	-5.55	0	-0.0626923
EGP_RETAIL_EGP_VALUE_PERC	-0.0186392	0.005421	-3.44	0.0006	-0.040116898
DS_TOP_PERC	-0.0232592	0.07967	-0.292	0.77030	-0.00155864
Constant	-0.550942	0.0139	-39.6	0.00000	
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.00416546	0.01046	0.398	0.6904	0.002300661
EGP_VALUE_T0_PERC	0.134109	0.00876	15.3	0	0.101123079
EGP_VALUE_FIX_PERC	0.0504485	0.00359	14.1	0	0.147305608
FF_PERC	2.6605	0.06952	38.3	0	0.272013991
ORDER20	0.101567	0.001971	51.5	0	0.416528193
ORDER10	0.164491	0.002248	73.2	0	0.865869191

Cairo Poultry					
ORDER10	-0.127483	0.005102	-25	0	-0.517778467
VWAP20	-0.274653	0.008752	-31.4	0.00000	-0.501387448
FOR_INSTIT_EGP_VALUE_PERC	-0.122693	0.01539	-7.97	0	-0.169604793
EGP_RETAIL_EGP_VALUE_PERC	-0.0366645	0.01373	-2.67	0.0076	-0.069918883
FF_PERC	-0.0848104	0.02146	-3.95	0.0001	-0.058313149
EGP_INSTIT_EGP_VALUE_PERC	-0.0112625	0.01589	-0.709	0.47860	-0.014332022
DS_TOP_PERC	-0.0134948	0.2566	-0.0526	0.95810	-0.000575812
Constant	0.211729	0.01739	12.2	0.00000	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_NOFIX_PERC	0.0150893	0.007471	2.02	0.0435	0.038415277
EGP_VALUE_OMNIBUS_PERC	0.196443	0.03312	5.93	0	0.069737742
EGP_VALUE_T0_PERC	0.605697	0.04038	15	0	0.169383045

Oriental Weavers					
VWAP20	-0.18048	0.01832	-9.85	0.00000	-0.617024746
ORDER10	-0.145298	0.01889	-7.69	0	-0.515066733
FOR_INSTIT_EGP_VALUE_PERC	-0.138918	0.01618	-8.58	0	-0.23699854
ORDER20	-0.0881242	0.0186	-4.74	0	-0.212830967

EGP_RETAIL_EGP_VALUE_PERC	-0.101762	0.01586	-6.42	0	-0.201727813
EGP_INSTIT_EGP_VALUE_PERC	-0.0601322	0.01635	-3.68	0.00020	-0.09177724
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	-0.00338402	0.02464	-0.137	0.89080	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.134795	0.2546	0.529	0.59650	0.005043302
EGP_VALUE_OMNIBUS_PERC	0.0846011	0.02439	3.47	0.0005	0.035010475
EGP_VALUE_T0_PERC	0.221167	0.03492	6.33	0	0.068458126
EGP_VALUE_FIX_PERC	0.0582264	0.008075	7.21	0	0.117702692
FF_PERC	0.642282	0.02018	31.8	0	0.595773035

United Housing & Development

EGP_RETAIL_EGP_VALUE_PERC	-0.431343	0.06503	-6.63	0	-0.341583499
EGP_INSTIT_EGP_VALUE_PERC	-0.464316	0.06716	-6.91	0.00000	-0.316513113
FOR_INSTIT_EGP_VALUE_PERC	-0.495174	0.07716	-6.42	0	-0.182852175
EGP_VALUE_NOFIX_PERC	-0.0270951	0.02355	-1.15	0.2501	-0.031413347
VWAP20	-0.0127599	0.01157	-1.1	0.27030	-0.02507187
Constant	0.0746309	0.07556	0.988	0.32330	
EGP_VALUE_FIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER10	0.00667443	0.01781	0.375	0.7079	0.014867846
DS_TOP_PERC	0.874637	0.5334	1.64	0.10110	0.023672733
EGP_VALUE_T0_PERC	0.206374	0.06806	3.03	0.0024	0.060682242
ORDER20	0.0554306	0.0177	3.13	0.0018	0.083744007
EGP_VALUE_OMNIBUS_PERC	0.616296	0.09947	6.2	0	0.094206631
FF_PERC	0.623433	0.05333	11.7	0	0.216845496

Six of October Development & Investment (SODIC)

VWAP20	-0.188547	0.009798	-19.2	0.00000	-0.431942009
EGP_RETAIL_EGP_VALUE_PERC	-0.287974	0.02827	-10.2	0	-0.365155192
EGP_INSTIT_EGP_VALUE_PERC	-0.302362	0.03389	-8.92	0.00000	-0.219292065
FOR_INSTIT_EGP_VALUE_PERC	-0.220248	0.03141	-7.01	0	-0.194963994
EGP_VALUE_OMNIBUS_PERC	-0.0210613	0.06875	-0.306	0.7594	-0.004236491
Constant	0.225276	0.0408	5.52	0.00000	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.276778	0.5204	0.532	0.59490	0.006761849
FF_PERC	0.0329362	0.03249	1.01	0.3108	0.028625476
EGP_VALUE_T0_PERC	0.406314	0.04996	8.13	0	0.143824348
EGP_VALUE_NOFIX_PERC	0.179448	0.02007	8.94	0	0.249894889
ORDER10	0.117884	0.01045	11.3	0	0.306635768

El Ahli Investment and Development

EGP_INSTIT_EGP_VALUE_PERC	-0.994794	0.07097	-14	0.00000	-0.639650808
EGP_RETAIL_EGP_VALUE_PERC	-0.28514	0.0702	-4.06	0	-0.198198027
EGP_VALUE_TO_PERC	-0.219506	0.03643	-6.03	0	-0.081426283
FOR_RETAIL_EGP_VALUE_PERC	-0.0584903	0.08476	-0.69	0.4902	-0.013040662
DS_TOP_PERC	-0.0301886	0.3732	-0.0809	0.93550	-0.000800395
EGP_VALUE_FIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.147541	0.07338	2.01	0.04440	
VWAP20	0.00912851	0.007164	1.27	0.20260	0.017358856
EGP_VALUE_OMNIBUS_PERC	1.2157	0.2461	4.94	0	0.049026808
EGP_VALUE_NOFIX_PERC	0.072128	0.01689	4.27	0	0.103553114
FF_PERC	0.230611	0.02318	9.95	0	0.121528499
ORDER20	0.25415	0.01104	23	0	0.419509576
ORDER10	0.263348	0.01205	21.9	0	0.63042348
Egyptian Kuwaiti Holding					
EGP_RETAIL_EGP_VALUE_PERC	-0.122405	0.03857	-3.17	0.0015	-0.120789362
FOR_INSTIT_EGP_VALUE_PERC	-0.082205	0.04184	-1.96	0.0495	-0.070598047
EGP_VALUE_FIX_PERC	-0.0515583	0.02375	-2.17	0.03	-0.064546563
EGP_INSTIT_EGP_VALUE_PERC	-0.00737247	0.04912	-0.15	0.88070	-0.003797052
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.0506643	0.0416	1.22	0.22340	
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.695814	0.7868	0.884	0.37650	0.013639353
EGP_VALUE_OMNIBUS_PERC	0.100323	0.08371	1.2	0.2308	0.019883389
FF_PERC	0.0846643	0.02456	3.45	0.0006	0.061445857
EGP_VALUE_TO_PERC	0.815315	0.1693	4.81	0	0.09729967
ORDER10	0.0591039	0.0176	3.36	0.0008	0.127528205
ORDER20	0.104835	0.01862	5.63	0	0.158369633
Delta Sugar					
EGP_VALUE_FIX_PERC	-0.0492092	0.01006	-4.89	0	-0.136157526
ORDER10	-0.00433883	0.008141	-0.533	0.5941	-0.020245195
EGP_VALUE_OMNIBUS_PERC	-0.0216501	0.04321	-0.501	0.6164	-0.008242094
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	-0.0247933	0.01747	-1.42	0.15600	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
DS_TOP_PERC	0.326891	0.4144	0.789	0.43030	0.0126305
FOR_RETAIL_EGP_VALUE_PERC	0.0859814	0.02621	3.28	0.001	0.069699872
EGP_VALUE_TO_PERC	0.397491	0.05444	7.3	0	0.120779342
EGP_RETAIL_EGP_VALUE_PERC	0.0931034	0.01685	5.52	0	0.200165788
EGP_INSTIT_EGP_VALUE_PERC	0.115919	0.019	6.1	0.00000	0.209677073

FF_PERC	0.164529	0.01603	10.3	0	0.239936799
ORDER20	0.0856383	0.007413	11.6	0	0.293350774

Acrow Misr					
FOR_INSTIT_EGP_VALUE_PERC	-0.349331	0.04054	-8.62	0	-0.125723936
EGP_RETAIL_EGP_VALUE_PERC	-0.0946585	0.01916	-4.94	0	-0.10313443
EGP_VALUE_FIX_PERC	-0.016214	0.008826	-1.84	0.0663	-0.0351584
EGP_INSTIT_EGP_VALUE_PERC	-0.00129334	0.02672	-0.0484	0.96140	-0.000885545
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	-0.297212	0.01772	-16.8	0.00000	
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.240828	0.3815	0.631	0.52790	0.007971955
EGP_VALUE_OMNIBUS_PERC	0.0706893	0.07409	0.954	0.3401	0.012552745
EGP_VALUE_T0_PERC	0.815838	0.1	8.16	0	0.109206004
ORDER20	0.118911	0.009143	13	0	0.331308333
FF_PERC	0.988502	0.03078	32.1	0	0.478841244
ORDER10	0.135326	0.009068	14.9	0	0.512700522

Giza General Contracting					
EGP_VALUE_FIX_PERC	-0.200408	0.01292	-15.5	0	-0.402134985
FOR_RETAIL_EGP_VALUE_PERC	-0.203506	0.0571	-3.56	0.0004	-0.093295461
EGP_RETAIL_EGP_VALUE_PERC	-0.11968	0.05189	-2.31	0.0211	-0.092787566
EGP_INSTIT_EGP_VALUE_PERC	-0.127164	0.05395	-2.36	0.01850	-0.079342893
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.0586796	0.05315	1.1	0.26960	
VWAP20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.00747423	0.09988	0.0748	0.9404	0.000829429
DS_TOP_PERC	0.0819165	0.2385	0.344	0.73120	0.003651176
EGP_VALUE_T0_PERC	0.123507	0.04426	2.79	0.0053	0.033371961
FF_PERC	0.0818629	0.02031	4.03	0.0001	0.072703278
ORDER20	0.273747	0.008633	31.7	0	0.605929224
ORDER10	0.286213	0.01	28.6	0	0.957893668

Abu Dhabi Islamic Bank- Egypt					
VWAP20	-0.280875	0.007252	-38.7	0.00000	-0.62949517
ORDER10	-0.0465404	0.006947	-6.7	0	-0.143552051
EGP_INSTIT_EGP_VALUE_PERC	-0.114466	0.02073	-5.52	0.00000	-0.093891712
EGP_RETAIL_EGP_VALUE_PERC	-0.0197612	0.01663	-1.19	0.2347	-0.022334858
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.0437247	0.01991	2.2	0.02820	
ORDER20	0	0			0

DS_TOP_PERC	0.0334358	0.3201	0.104	0.91680	0.000991705
FOR_RETAIL_EGP_VALUE_PERC	0.0201837	0.02707	0.745	0.456	0.00904181
EGP_VALUE_OMNIBUS_PERC	0.0830819	0.04299	1.93	0.0533	0.01992642
EGP_VALUE_FIX_PERC	0.0129755	0.01276	1.02	0.3094	0.022476029
EGP_VALUE_T0_PERC	0.288998	0.02455	11.8	0	0.147105388
FF_PERC	0.553329	0.03097	17.9	0	0.209159539

Housing & Development Bank					
FF_PERC	-0.185772	0.03249	-5.72	0	-0.158039337
FOR_INSTIT_EGP_VALUE_PERC	-0.0867543	0.0354	-2.45	0.0143	-0.058720267
EGP_RETAIL_EGP_VALUE_PERC	-0.0322504	0.02744	-1.18	0.2399	-0.033196748
EGP_VALUE_OMNIBUS_PERC	-0.0380242	0.093	-0.409	0.6827	-0.006721519
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.0593653	0.02867	2.07	0.03850	
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0.00436084	0.03912	0.111	0.9113	0.002279153
DS_TOP_PERC	2.04471	1.237	1.65	0.09850	0.025640685
ORDER20	0.0420383	0.01514	2.78	0.0055	0.057495546
EGP_VALUE_FIX_PERC	0.0564633	0.0233	2.42	0.0154	0.061698238
EGP_VALUE_T0_PERC	0.471238	0.1223	3.85	0.0001	0.064684356
ORDER10	0.0508446	0.01621	3.14	0.0017	0.100184925

Egyptian Financial Group-Hermes Holding Company					
VWAP20	-0.140261	0.004239	-33.1	0.00000	-0.616025954
FF_PERC	-0.0149739	0.01013	-1.48	0.1392	-0.024501688
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.0559103	0.01634	-3.42	0.00060	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.0178592	0.1619	0.11	0.91220	0.001045965
FOR_RETAIL_EGP_VALUE_PERC	0.0151083	0.01983	0.762	0.4463	0.009635522
EGP_RETAIL_EGP_VALUE_PERC	0.00739028	0.01295	0.571	0.5683	0.016804019
EGP_VALUE_OMNIBUS_PERC	0.108715	0.02294	4.74	0	0.047797215
FOR_INSTIT_EGP_VALUE_PERC	0.0292335	0.01266	2.31	0.021	0.060749385
EGP_VALUE_T0_PERC	0.207475	0.01963	10.6	0	0.12473731
EGP_VALUE_NOFIX_PERC	0.200018	0.009124	21.9	0	0.479970705
ORDER10	0.130672	0.004771	27.4	0	0.611872644

Credit Agricole Egypt					
EGP_VALUE_T0_PERC	-0.318575	0.09429	-3.38	0.0007	-0.061886714
FOR_RETAIL_EGP_VALUE_PERC	-0.0685611	0.0279	-2.46	0.014	-0.046139067
FOR_INSTIT_EGP_VALUE_PERC	-0.00767409	0.01545	-0.497	0.6195	-0.012894074
EGP_RETAIL_EGP_VALUE_PERC	-0.00428517	0.01346	-0.318	0.7503	-0.008897471

EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	-0.112496	0.02391	-4.71	0.00000	
EGP_VALUE_OMNIBUS_PERC	0.0242434	0.04052	0.598	0.5496	0.010661771
DS_TOP_PERC	0.843735	0.8535	0.989	0.32300	0.016782387
EGP_VALUE_NOFIX_PERC	0.0223768	0.01323	1.69	0.0909	0.041120092
FF_PERC	0.133216	0.05046	2.64	0.0083	0.071341338
ORDER20	0.0681939	0.01016	6.71	0	0.156298892
ORDER10	0.0665102	0.01064	6.25	0	0.196685492

Alexandria Mineral Oils Company

VWAP20	-0.239961	0.006702	-35.8	0.00000	-0.595633135
ORDER10	-0.0870988	0.006242	-14	0	-0.264867934
EGP_VALUE_NOFIX_PERC	-0.0110664	0.01323	-0.837	0.4029	-0.018915324
FOR_INSTIT_EGP_VALUE_PERC	-0.00171361	0.02745	-0.0624	0.9502	-0.001881711
Constant	0.0203715	0.02921	0.697	0.48560	
EGP_VALUE_FIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.0256868	0.0322	0.798	0.4251	0.009983451
DS_TOP_PERC	0.484892	0.3441	1.41	0.15880	0.01629575
EGP_INSTIT_EGP_VALUE_PERC	0.0214781	0.02799	0.767	0.44280	0.022919615
EGP_RETAIL_EGP_VALUE_PERC	0.0661138	0.02647	2.5	0.0125	0.095573786
EGP_VALUE_T0_PERC	0.440144	0.04553	9.67	0	0.137190197
FF_PERC	0.49135	0.02602	18.9	0	0.379015316

Extracted Oils

EGP_INSTIT_EGP_VALUE_PERC	-0.193644	0.05024	-3.85	0.00010	-0.096380581
VWAP20	-0.0281373	0.005833	-4.82	0.00000	-0.087319165
FOR_RETAIL_EGP_VALUE_PERC	-0.00457583	0.05339	-0.0857	0.9317	-0.001759572
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.0742947	0.04674	-1.59	0.11200	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.0333636	0.26	0.128	0.89790	0.001553975
EGP_RETAIL_EGP_VALUE_PERC	0.0170056	0.04355	0.391	0.6962	0.011598931
EGP_VALUE_T0_PERC	0.0720201	0.04271	1.69	0.0918	0.03344265
EGP_VALUE_OMNIBUS_PERC	0.884888	0.2722	3.25	0.0012	0.039328782
EGP_VALUE_NOFIX_PERC	0.0193751	0.01578	1.23	0.2195	0.040915484
ORDER10	0.0402356	0.01731	2.32	0.0202	0.141006255
ORDER20	0.105414	0.01441	7.32	0	0.250042552
FF_PERC	0.239533	0.03658	6.55	0	0.35365536

Egyptian Iron & Steel

VWAP20	-0.146035	0.008196	-17.8	0.00000	-0.202131871
EGP_VALUE_T0_PERC	-0.139218	0.0221	-6.3	0	-0.078236045
EGP_RETAIL_EGP_VALUE_PERC	-0.0128789	0.03844	-0.335	0.7376	-0.006700088
DS_TOP_PERC	-0.155678	0.2357	-0.66	0.50910	-0.005743748
Constant	0.203878	0.03938	5.18	0.00000	
EGP_VALUE_FIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0.00974728	0.05094	0.191	0.8482	0.002591861
FF_PERC	0.000122969	0.0003682	0.334	0.7384	0.002920378
EGP_INSTIT_EGP_VALUE_PERC	0.0303256	0.0453	0.67	0.50320	0.011236337
EGP_VALUE_OMNIBUS_PERC	0.215611	0.1175	1.83	0.0666	0.016334394
EGP_VALUE_NOFIX_PERC	0.0286528	0.01464	1.96	0.0504	0.048606504
ORDER10	0.0884952	0.00672	13.2	0	0.266696029
Raya Holding For Financial Investments					
VWAP20	-0.0750706	0.001115	-67.3	0.00000	-0.792995278
FF_PERC	-0.0713344	0.003588	-19.9	0	-0.172487762
ORDER10	-0.0124168	0.00122	-10.2	0	-0.163310756
EGP_VALUE_NOFIX_PERC	-0.00462414	0.009969	-0.464	0.6428	-0.034057563
EGP_RETAIL_EGP_VALUE_PERC	-0.00355231	0.004208	-0.844	0.3987	-0.014454546
FOR_INSTIT_EGP_VALUE_PERC	-0.00403729	0.005095	-0.792	0.4282	-0.009867969
Constant	0.184925	0.00932	19.8	0.00000	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.00891288	0.04299	0.207	0.83580	0.001501544
EGP_VALUE_FIX_PERC	0.000253484	0.009947	0.0255	0.9797	0.001864331
EGP_VALUE_OMNIBUS_PERC	0.00566203	0.00761	0.744	0.4569	0.005715758
EGP_VALUE_T0_PERC	0.0188512	0.006237	3.02	0.0025	0.031446272
EGP_INSTIT_EGP_VALUE_PERC	0.0136826	0.004959	2.76	0.00580	0.038860965

Table 11.2: Category B Regressions Summary

Company Name	Coefficient	Std.Error	t-value	t-prob	Standardized Coefficients
Alexandria Spinning & Weaving (SPINALEX)					
VWAP20	-0.167277	0.008813	-19	0	-0.367389659
FF_PERC	-0.273218	0.01708	-16	0	-0.247200357
EGP_VALUE_FIX_PERC	-0.108306	0.01216	-8.91	0	-0.230839913
EGP_RETAIL_EGP_VALUE_PERC	-0.190596	0.05978	-3.19	0.0014	-0.112658754
FOR_RETAIL_EGP_VALUE_PERC	-0.14779	0.07089	-2.08	0.0372	-0.0517715
EGP_VALUE_OMNIBUS_PERC	-0.490917	0.4147	-1.18	0.2366	-0.015477926
ORDER10	-0.00424166	0.009213	-0.46	0.6453	-0.014952461
EGP_INSTIT_EGP_VALUE_PERC	-0.0326011	0.06729	-0.484	0.6281	-0.013647451
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.441934	0.06015	7.35	0	
EGP_VALUE_NOFIX_PERC	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.0746002	0.2578	0.289	0.7723	0.003782517
EGP_VALUE_T0_PERC	0.287794	0.0361	7.97	0	0.170915528
Upper Egypt Flour Mills					
FOR_RETAIL_EGP_VALUE_PERC	-0.0710725	0.02296	-3.1	0.002	-0.070050709
EGP_RETAIL_EGP_VALUE_PERC	-0.032784	0.01789	-1.83	0.0669	-0.064570172
EGP_VALUE_NOFIX_PERC	-0.011205	0.009089	-1.23	0.2177	-0.028109302
EGP_VALUE_OMNIBUS_PERC	-0.0762342	0.054	-1.41	0.1581	-0.021369113
DS_TOP_PERC	-0.598193	0.7032	-0.851	0.395	-0.012508533
Constant	-0.147208	0.02341	-6.29	0	
EGP_VALUE_T0_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0.0200726	0.02	1	0.3155	0.031608913
FF_PERC	0.0959827	0.02903	3.31	0.001	0.051279789
VWAP20	0.068832	0.007747	8.88	0.0000	0.290654074
ORDER10	0.107654	0.008878	12.1	0	0.45415979
ORDER20	0.164932	0.008878	18.6	0	0.49646576
Egyptian Gulf Bank					
EGP_RETAIL_EGP_VALUE_PERC	-0.520744	0.1962	-2.65	0.008	-0.614821102
FOR_INSTIT_EGP_VALUE_PERC	-0.583919	0.1969	-2.97	0.003	-0.489942503
EGP_INSTIT_EGP_VALUE_PERC	-0.478935	0.1975	-2.43	0.0153	-0.321010242
FOR_RETAIL_EGP_VALUE_PERC	-0.439976	0.1975	-2.23	0.026	-0.278758569
FF_PERC	-0.219233	0.02167	-10.1	0	-0.155956396
VWAP20	-0.11788	0.01441	-8.18	0.0000	-0.150319607
DS_TOP_PERC	-0.0907057	0.9669	-0.0938	0.9253	-0.00138133

EGP_VALUE_OMNIBUS_PERC	-0.00429307	0.1011	-0.0425	0.9661	-0.000640029
Constant	0.576446	0.1961	2.94	0.0033	
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_T0_PERC	1.33627	0.6299	2.12	0.0339	0.031239875
EGP_VALUE_NOFIX_PERC	0.0315866	0.0157	2.01	0.0443	0.047998794
ORDER10	0.0346828	0.01043	3.32	0.0009	0.082441748
Delta Construction & Rebuilding					
EGP_RETAIL_EGP_VALUE_PERC	-0.748616	0.08189	-9.14	0	-0.475856699
FOR_RETAIL_EGP_VALUE_PERC	-0.764432	0.0871	-8.78	0	-0.384435205
EGP_INSTIT_EGP_VALUE_PERC	-0.933324	0.09555	-9.77	0	-0.315041
FF_PERC	-0.187829	0.05728	-3.28	0.0011	-0.132060309
DS_TOP_PERC	-0.000906578	0.4261	-0.00213	0.9983	-3.02033E-05
EGP_VALUE_FIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
Constant	0.460865	0.08626	5.34	0	
EGP_VALUE_OMNIBUS_PERC	0.138024	0.2173	0.635	0.5254	0.00970356
EGP_VALUE_T0_PERC	0.628385	0.07695	8.17	0	0.121250697
EGP_VALUE_NOFIX_PERC	0.385375	0.01493	25.8	0	0.670753601
ORDER20	0.302939815	0.01246	24.3	0	0.688745731
ORDER10	0.2971875	0.01641	18.1	0	0.875671707
Misr Chemical Industries					
VWAP20	-0.0608922	0.03935	-1.55	0.1218	-0.47062245
EGP_VALUE_FIX_PERC	-0.0647108	0.004189	-15.4	0	-0.293701548
EGP_INSTIT_EGP_VALUE_PERC	-0.0305971	0.01152	-2.66	0.0079	-0.054670689
FOR_RETAIL_EGP_VALUE_PERC	-0.0408406	0.01327	-3.08	0.0021	-0.044372193
FF_PERC	-0.0550458	0.02576	-2.14	0.0326	-0.028525509
EGP_VALUE_T0_PERC	-0.0221261	0.01442	-1.53	0.125	-0.020301923
DS_TOP_PERC	-0.146736	0.1475	-0.995	0.3198	-0.00928189
EGP_VALUE_OMNIBUS_PERC	-0.0150578	0.02529	-0.595	0.5515	-0.005810858
Constant	0.060723	0.04125	1.47	0.141	
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_RETAIL_EGP_VALUE_PERC	0.0327906	0.009902	3.31	0.0009	0.074604479
ORDER20	0.0809448	0.03943	2.05	0.0401	0.426271268
ORDER10	0.06828	0.03941	1.73	0.0832	0.533244082
Alexandria Flour Mills					
VWAP20	-0.185926	0.01005	-18.5	0.0000	-0.360976794
EGP_RETAIL_EGP_VALUE_PERC	-0.132456	0.03644	-3.64	0.0003	-0.182952317
ORDER10	-0.0506386	0.006927	-7.31	0	-0.16139726

EGP_VALUE_T0_PERC	-0.415038	0.09217	-4.5	0	-0.065296783
EGP_INSTIT_EGP_VALUE_PERC	-0.0136932	0.04268	-0.321	0.7483	-0.010013059
FF_PERC	-0.384385	0.06101	-6.3	0	-0.004996733
Constant	0.283758	0.03948	7.19	0	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.369356	0.2514	1.47	0.1419	0.011127736
EGP_VALUE_OMNIBUS_PERC	0.19752	0.1276	1.55	0.1218	0.056409731
FOR_INSTIT_EGP_VALUE_PERC	0.0884595	0.05694	1.55	0.1204	0.09308616
EGP_VALUE_FIX_PERC	0.0646037	0.01115	5.79	0	0.125313792
Egyptian Transport (EGYTRANS)					
EGP_RETAIL_EGP_VALUE_PERC	-0.246421	0.03689	-6.68	0	-0.295016191
FOR_RETAIL_EGP_VALUE_PERC	-0.207657	0.04212	-4.93	0	-0.148844794
EGP_INSTIT_EGP_VALUE_PERC	-0.103994	0.04038	-2.58	0.0101	-0.094573648
EGP_VALUE_OMNIBUS_PERC	-0.24958	0.05743	-4.35	0	-0.065012252
EGP_VALUE_FIX_PERC	-0.0139943	0.01116	-1.25	0.2098	-0.037349927
DS_TOP_PERC	-0.0264824	0.1688	-0.157	0.8754	-0.002223923
Constant	0.33783	0.0368	9.18	0	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
FF_PERC	0.00543119	0.0151	0.36	0.719	0.009208476
EGP_VALUE_T0_PERC	0.107434	0.02689	3.99	0.0001	0.072744985
ORDER20	0.102424	0.005567	18.4	0	0.400220816
ORDER10	0.170456	0.007955	21.4	0	0.830735995
Elsaeed Contracting& Real Estate Investment Company SCCD					
EGP_RETAIL_EGP_VALUE_PERC	-0.262985	0.04579	-5.74	0	-0.123272849
EGP_INSTIT_EGP_VALUE_PERC	-0.329355	0.05522	-5.96	0	-0.11902424
EGP_VALUE_NOFIX_PERC	-0.0363571	0.01577	-2.31	0.0212	-0.057109053
VWAP20	-0.422878	0.1243	-3.4	0.0007	-0.035945848
FOR_INSTIT_EGP_VALUE_PERC	-0.181719	0.0791	-2.3	0.0217	-0.030652673
EGP_VALUE_FIX_PERC	0	0			0
Constant	0.185191	0.04985	3.72	0.0002	
ORDER20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.0322375	0.2471	0.13	0.8962	0.00137639
EGP_VALUE_OMNIBUS_PERC	0.334728	0.1286	2.6	0.0093	0.029020052
EGP_VALUE_T0_PERC	0.167494	0.04267	3.93	0.0001	0.056260742
ORDER10	0.0370032	0.009442	3.92	0.0001	0.098707938
FF_PERC	0.369348	0.01662	22.2	0	0.3022908

Commercial International Bank (Egypt)					
FF_PERC	-0.68534	0.02087	-32.8	0	-1496600532
EGP_VALUE_T0_PERC	-0.228571	0.04433	-5.16	0	-0.391791206
FOR_INSTIT_EGP_VALUE_PERC	-0.0673353	0.01236	-5.45	0	-0.037913161
FOR_RETAIL_EGP_VALUE_PERC	-0.0254642	0.02332	-1.09	0.2749	-0.024645309
EGP_VALUE_FIX_PERC	-0.0697157	0.01264	-5.51	0	-0.021237951
VWAP20	-0.054636	0.09882	-0.553	0.5804	-0.00622812
Constant	0.617623	0.1002	6.17	0	
EGP_VALUE_NOFIX_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.0127846	0.0306	0.418	0.6761	0.027174162
ORDER10	0.121055	0.09905	1.22	0.2217	0.307244133
ORDER20	0.102763	0.09904	1.04	0.2995	0.383306217
DS_TOP_PERC	0.254663	0.4459	0.571	0.5679	0.941612756
EGP_RETAIL_EGP_VALUE_PERC	0.0134293	0.01497	0.897	0.3696	218735.3142
Asek Company for Mining - Ascom					
ORDER10	-0.0425259	0.002549	-16.7	0	-0.123748343
FF_PERC	-0.178967	0.007874	-22.7	0	-0.109637277
EGP_VALUE_OMNIBUS_PERC	-0.102098	0.01825	-5.6	0	-0.024298984
EGP_RETAIL_EGP_VALUE_PERC	-0.0325657	0.01874	-1.74	0.0824	-0.022447892
EGP_INSTIT_EGP_VALUE_PERC	-0.0318057	0.02034	-1.56	0.1179	-0.0185643
DS_TOP_PERC	-0.0217454	0.09986	-0.218	0.8276	-0.000856648
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.259624	0.0187	13.9	0	
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0.00856924	0.02446	0.35	0.7262	0.002237482
EGP_VALUE_FIX_PERC	0.0290107	0.00439	6.61	0	0.046189182
EGP_VALUE_T0_PERC	0.123107	0.01116	11	0	0.054469097
Remco for Touristic Villages Construction					
EGP_VALUE_FIX_PERC	-0.0931158	0.01228	-7.59	0	-0.234273451
FF_PERC	-0.299716	0.02766	-10.8	0	-0.191480022
FOR_INSTIT_EGP_VALUE_PERC	-0.0759003	0.04319	-1.76	0.079	-0.05145106
EGP_VALUE_OMNIBUS_PERC	-0.149358	0.2733	-0.546	0.5848	-0.007992243
VWAP20	0	0			0
ORDER20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.245011	0.03668	6.68	0	
DS_TOP_PERC	0.128389	0.2364	0.543	0.587	0.007866582

EGP_RETAIL_EGP_VALUE_PERC	0.0323305	0.0366	0.883	0.3772	0.034628878
EGP_VALUE_T0_PERC	0.100416	0.02071	4.85	0	0.077548972
EGP_INSTIT_EGP_VALUE_PERC	0.211072	0.04274	4.94	0	0.143573145
ORDER10	0.0492037	0.006162	7.99	0	0.228702686
Engineering Industries (ICON)					
ORDER10	-0.0577882	0.005327	-10.8	0	-0.259757236
FOR_INSTIT_EGP_VALUE_PERC	-0.291811	0.03752	-7.78	0	-0.146498615
EGP_RETAIL_EGP_VALUE_PERC	-0.0677299	0.028	-2.42	0.0156	-0.064410178
DS_TOP_PERC	-0.297508	0.2268	-1.31	0.1897	-0.016752742
EGP_VALUE_FIX_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	-0.0848301	0.032	-2.65	0.0081	
ORDER20	0	0			0
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0.0214097	0.03512	0.61	0.5422	0.013037041
EGP_VALUE_OMNIBUS_PERC	0.184302	0.06371	2.89	0.0038	0.042293376
EGP_VALUE_T0_PERC	0.184535	0.05009	3.68	0.0002	0.049059973
EGP_VALUE_NOFIX_PERC	0.0516331	0.009718	5.31	0	0.123943596
FF_PERC	0.541307	0.02124	25.5	0	0.352019299
Egyptian Media Production City					
VWAP20	-0.0786565	0.04779	-1.65	0.0998	-0.539843113
FF_PERC	-0.212421	0.00975	-21.8	0	-0.271982716
ORDER10	-0.00149979	0.04792	-0.0313	0.975	-0.010401036
EGP_VALUE_OMNIBUS_PERC	-0.0223339	0.07173	-0.311	0.7555	-0.003190442
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.106913	0.05044	2.12	0.0341	
DS_TOP_PERC	0.0326575	0.1158	0.282	0.7779	0.002857209
FOR_INSTIT_EGP_VALUE_PERC	0.0262088	0.0237	1.11	0.2689	0.015494824
EGP_VALUE_T0_PERC	0.0590632	0.01193	4.95	0	0.066000831
EGP_RETAIL_EGP_VALUE_PERC	0.0725442	0.01615	4.49	0	0.09080879
ORDER20	0.0212491	0.04787	0.444	0.6572	0.099329843
EGP_VALUE_FIX_PERC	0.0550972	0.006593	8.36	0	0.228112827
EGP_INSTIT_EGP_VALUE_PERC	0.30821	0.01982	15.5	0	0.263470078
Egyptians Abroad for Investment & Development					
EGP_VALUE_FIX_PERC	-0.11835	0.01301	-9.1	0	-0.346926472
EGP_INSTIT_EGP_VALUE_PERC	-0.0767234	0.0964	-0.796	0.4262	-0.083701994
FOR_INSTIT_EGP_VALUE_PERC	-0.196935	0.1062	-1.85	0.0637	-0.066802788
FOR_RETAIL_EGP_VALUE_PERC	-0.163858	0.103	-1.59	0.1117	-0.066390685
EGP_RETAIL_EGP_VALUE_PERC	-0.041659	0.09556	-0.436	0.6629	-0.051421681
VWAP20	0	0			0

EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.0471535	0.09589	0.492	0.6229	
DS_TOP_PERC	0.0811053	0.2022	0.401	0.6883	0.00635946
EGP_VALUE_OMNIBUS_PERC	0.224856	0.2746	0.819	0.413	0.012849849
EGP_VALUE_TO_PERC	0.124384	0.03119	3.99	0.0001	0.085963195
ORDER20	0.0391462	0.007922	4.94	0	0.137493595
FF_PERC	0.353202	0.03277	10.8	0	0.227329967
ORDER10	0.0982096	0.008765	11.2	0	0.476773608
El Kahera Housing					
VWAP20	-0.192888	0.1512	-1.28	0.2022	-0.553870542
EGP_INSTIT_EGP_VALUE_PERC	-0.205016	0.04316	-4.75	0	-0.127090039
EGP_RETAIL_EGP_VALUE_PERC	-0.0340488	0.03669	-0.928	0.3534	-0.028079997
EGP_VALUE_TO_PERC	-0.0479765	0.05829	-0.823	0.4105	-0.01892421
ORDER10	-0.00422613	0.1515	-0.0279	0.9777	-0.012112113
EGP_VALUE_FIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	-0.118918	0.157	-0.758	0.4487	
DS_TOP_PERC	0.26781	0.4341	0.617	0.5373	0.008430832
EGP_VALUE_OMNIBUS_PERC	0.170732	0.09492	1.8	0.0721	0.025510523
ORDER20	0.0153735	0.1517	0.101	0.9193	0.03039695
FOR_INSTIT_EGP_VALUE_PERC	0.0812018	0.04938	1.64	0.1002	0.033998689
EGP_VALUE_NOFIX_PERC	0.169366	0.01611	10.5	0	0.26994208
FF_PERC	0.285333	0.01575	18.1	0	0.367373089
Palm Hills Development Company					
FF_PERC	-0.173529	0.02101	-8.26	0	-0.189867346
EGP_VALUE_TO_PERC	-0.142685	0.02036	-7.01	0	-0.116328241
EGP_VALUE_OMNIBUS_PERC	-0.137334	0.03865	-3.55	0.0004	-0.051550873
EGP_RETAIL_EGP_VALUE_PERC	-0.0238627	0.0241	-0.99	0.3222	-0.041118297
EGP_VALUE_NOFIX_PERC	-0.015467	0.01046	-1.48	0.1393	-0.031315254
EGP_INSTIT_EGP_VALUE_PERC	-0.00288509	0.02627	-0.11	0.9125	-0.002968805
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
Constant	0.00123938	0.027	0.0459	0.9634	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.224428	0.1824	1.23	0.2187	0.015990197
FOR_INSTIT_EGP_VALUE_PERC	0.020243	0.02507	0.807	0.4195	0.02955049
ORDER20	0.314409	0.007339	42.8	0	1.289514932
ORDER10	0.384969	0.009405	40.9	0	1.71225155
Pioneers Holding					
ORDER20	-0.017707	0.002394	-7.4	0	-0.129377507
EGP_RETAIL_EGP_VALUE_PERC	-0.0104195	0.007896	-1.32	0.1871	-0.022067038

DS_TOP_PERC	-0.0606277	0.03818	-1.59	0.1124	-0.011122306
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.121642	0.00752	16.2	0	
VWAP20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.0378026	0.01483	2.55	0.0108	0.019461232
FOR_INSTIT_EGP_VALUE_PERC	0.0209279	0.01056	1.98	0.0475	0.022114648
EGP_INSTIT_EGP_VALUE_PERC	0.035402	0.008896	3.98	0.0001	0.058380577
EGP_VALUE_FIX_PERC	0.035989	0.003274	11	0	0.116392796
FF_PERC	0.0676656	0.004427	15.3	0	0.128373622
EGP_VALUE_T0_PERC	0.141695	0.00435	32.6	0	0.263769374
ORDER10	0.0887431	0.002663	33.3	0	0.691564349

Northern Upper Egypt Development & Agricultural Production

FF_PERC	-0.279042	0.007204	-38.7	0	-0.56547957
EGP_VALUE_FIX_PERC	-0.0464486	0.006567	-7.07	0	-0.157569573
FOR_INSTIT_EGP_VALUE_PERC	-0.0733894	0.04012	-1.83	0.0674	-0.036511814
EGP_VALUE_OMNIBUS_PERC	-0.515697	0.246	-2.1	0.0361	-0.026210778
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.350164	0.02923	12	0	
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
DS_TOP_PERC	0.058022	0.1391	0.417	0.6766	0.005148781
EGP_RETAIL_EGP_VALUE_PERC	0.0111232	0.02973	0.374	0.7084	0.008212771
FOR_RETAIL_EGP_VALUE_PERC	0.0387667	0.04897	0.792	0.4286	0.012592158
EGP_VALUE_T0_PERC	0.67077	0.1567	4.28	0	0.053330761
ORDER10	0.0964143	0.004659	20.7	0	0.552564426
ORDER20	0.166974	0.003807	43.9	0	0.775922394

International Agricultural Products

FF_PERC	-0.106892	0.008831	-12.1	0	-0.20007336
EGP_RETAIL_EGP_VALUE_PERC	-0.119606	0.02501	-4.78	0	-0.164389232
EGP_INSTIT_EGP_VALUE_PERC	-0.0412686	0.02757	-1.5	0.1346	-0.04944157
DS_TOP_PERC	-0.125673	0.1084	-1.16	0.2465	-0.014593058
EGP_VALUE_FIX_PERC	-0.000985398	0.005274	-0.187	0.8518	-0.003965856
ORDER10	-0.00044827	0.003543	-0.127	0.8993	-0.003243954
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.327697	0.02506	13.1	0	
VWAP20	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.100718	0.03529	2.85	0.0043	0.038208337
FOR_INSTIT_EGP_VALUE_PERC	0.136251	0.04771	2.86	0.0043	0.042599526
EGP_VALUE_T0_PERC	0.313298	0.01423	22	0	0.398463865

ARAB POLVARA SPINNING & WEAVING CO.				
FF_PERC	-0.393911	0.01122	-35.1	0	-0.639394706
EGP_VALUE_FIX_PERC	-0.0343158	0.007981	-4.3	0	-0.100547451
EGP_VALUE_OMNIBUS_PERC	-0.0999841	0.0857	-1.17	0.2434	-0.010517334
DS_TOP_PERC	-0.136175	0.1169	-1.16	0.2442	-0.010321416
Constant	0.211298	0.03237	6.53	0	
VWAP20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0.0634693	0.04117	1.54	0.1233	0.024969436
EGP_RETAIL_EGP_VALUE_PERC	0.0506658	0.03287	1.54	0.1233	0.034693284
EGP_INSTIT_EGP_VALUE_PERC	0.141411	0.03769	3.75	0.0002	0.06950452
EGP_VALUE_T0_PERC	0.294353	0.01752	16.8	0	0.24594672
ORDER20	0.21438	0.003889	55.1	0	0.811703416
ORDER10	0.267038	0.00495	53.9	0	1.429505144
Egyptian Financial & Industrial				
VWAP20	-0.135809	0.003097	-43.8	0.0000	-0.563080799
EGP_INSTIT_EGP_VALUE_PERC	-0.0495835	0.01113	-4.45	0	-0.083342363
EGP_RETAIL_EGP_VALUE_PERC	-0.0325384	0.01087	-2.99	0.0028	-0.066098288
ORDER10	-0.00663586	0.00329	-2.02	0.0438	-0.027991583
FOR_INSTIT_EGP_VALUE_PERC	-0.00588721	0.0118	-0.499	0.6179	-0.00686203
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.0479921	0.01215	3.95	0.0001	
ORDER20	0	0			0
DS_TOP_PERC	0.149567	0.1554	0.963	0.3358	0.005658043
EGP_VALUE_OMNIBUS_PERC	0.110426	0.01439	7.67	0	0.048414231
EGP_VALUE_T0_PERC	0.244004	0.01587	15.4	0	0.114014709
FF_PERC	0.155643	0.01221	12.7	0	0.157738541
EGP_VALUE_FIX_PERC	0.101527	0.005198	19.5	0	0.23353825
Development & Engineering Consultants				
ORDER10	-0.110957	0.007534	-14.7	0	-0.532507943
FF_PERC	-0.115028	0.01153	-9.97	0	-0.219489002
ORDER20	-0.0444737	0.006799	-6.54	0	-0.150946411
EGP_VALUE_OMNIBUS_PERC	-0.18731	0.136	-1.38	0.1685	-0.020398205
EGP_INSTIT_EGP_VALUE_PERC	-0.000809479	0.03144	-0.0257	0.9795	-0.000720514
Constant	0.123773	0.02699	4.59	0	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
DS_TOP_PERC	0.0984991	0.3185	0.309	0.7572	0.004569686

FOR_INSTIT_EGP_VALUE_PERC	0.101559	0.03433	2.96	0.0031	0.070082814
EGP_RETAIL_EGP_VALUE_PERC	0.0664188	0.02643	2.51	0.012	0.08330893
EGP_VALUE_T0_PERC	0.576443	0.04526	12.7	0	0.208647987
EGP_VALUE_FIX_PERC	0.0964613	0.009687	9.96	0	0.261169385
Medinet Nasr Housing					
FF_PERC	-0.135399	0.01031	-13.1	0	-0.111356907
EGP_INSTIT_EGP_VALUE_PERC	-0.012085	0.006179	-1.96	0.0506	-0.016387233
DS_TOP_PERC	-0.140262	0.1557	-0.901	0.3679	-0.005243716
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	-0.0251092	0.0494	-0.508	0.6113	
FOR_RETAIL_EGP_VALUE_PERC	0.0519113	0.01026	5.06	0	0.033243312
EGP_RETAIL_EGP_VALUE_PERC	0.0260239	0.004772	5.45	0	0.045057969
EGP_VALUE_OMNIBUS_PERC	0.115981	0.01464	7.92	0	0.049350842
VWAP20	0.017512	0.04917	0.356	0.7217	0.066778653
EGP_VALUE_T0_PERC	0.211905	0.01371	15.5	0	0.118421038
EGP_VALUE_FIX_PERC	0.0587617	0.005858	10	0	0.118926599
ORDER20	0.215859	0.04924	4.38	0	0.565712374
ORDER10	0.235524	0.04925	4.78	0	0.912629236
Egyptian Starch & Glucose					
FF_PERC	-0.364837	0.01468	-24.8	0	-0.355260104
EGP_VALUE_FIX_PERC	-0.0745682	0.01452	-5.14	0	-0.141053456
VWAP20	-0.0547501	0.01072	-5.11	0.0000	-0.093155115
ORDER10	-0.00636667	0.008324	-0.765	0.4444	-0.019107299
DS_TOP_PERC	-0.203085	0.5165	-0.393	0.6942	-0.004926741
Constant	-0.25109	0.05092	-4.93	0	
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.0515401	0.4568	0.113	0.9102	0.001418513
EGP_VALUE_T0_PERC	0.377004	0.05401	6.98	0	0.092214569
FOR_RETAIL_EGP_VALUE_PERC	0.406967	0.0665	6.12	0	0.125502037
EGP_INSTIT_EGP_VALUE_PERC	0.430236	0.05544	7.76	0	0.241100114
EGP_RETAIL_EGP_VALUE_PERC	0.438788	0.05072	8.65	0	0.30211855
Egyptian Chemical Industries (Kima)					
FF_PERC	-0.454267	0.04274	-10.6	0	-0.139417061
EGP_VALUE_T0_PERC	-0.0875299	0.02559	-3.42	0.0006	-0.036024268
FOR_INSTIT_EGP_VALUE_PERC	-0.158127	0.04239	-3.73	0.0002	-0.029926067
EGP_INSTIT_EGP_VALUE_PERC	-0.0361462	0.02682	-1.35	0.1779	-0.013346776
EGP_RETAIL_EGP_VALUE_PERC	-0.00853009	0.0196	-0.435	0.6634	-0.004650916
EGP_VALUE_FIX_PERC	0	0			0

Constant	-0.431974	0.03007	-14.4	0	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.0263866	0.05614	0.47	0.6384	0.003333744
VWAP20	0.0687371	0.08091	0.85	0.3956	0.005703576
DS_TOP_PERC	0.475944	0.2095	2.27	0.0231	0.014862086
EGP_VALUE_NOFIX_PERC	0.131221	0.01038	12.6	0	0.181359195
ORDER20	0.562397	0.0201	28	0	0.987875944
ORDER10	0.723308	0.02042	35.4	0	1.824128129
Egypt for Poultry					
EGP_RETAIL_EGP_VALUE_PERC	-0.103023	0.02464	-4.18	0	-0.08937014
FOR_RETAIL_EGP_VALUE_PERC	-0.0798875	0.02915	-2.74	0.0062	-0.057404109
DS_TOP_PERC	-0.0314761	0.1557	-0.202	0.8398	-0.002256373
EGP_VALUE_FIX_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
Constant	0.172757	0.02624	6.58	0	
ORDER10	0.000463861	0.004877	0.0951	0.9242	0.002601482
EGP_VALUE_OMNIBUS_PERC	0.327085	0.2312	1.41	0.1572	0.015893646
FOR_INSTIT_EGP_VALUE_PERC	0.134233	0.06009	2.23	0.0255	0.027364712
EGP_VALUE_T0_PERC	0.193426	0.02564	7.54	0	0.110952099
FF_PERC	0.068073	0.004806	14.2	0	0.184312804
EGP_VALUE_NOFIX_PERC	0.132611	0.007532	17.6	0	0.465948701
Naeem Holding					
EGP_RETAIL_EGP_VALUE_PERC	-0.0793246	0.04688	-1.69	0.0907	-0.085962937
FOR_RETAIL_EGP_VALUE_PERC	-0.0571727	0.0519	-1.1	0.2708	-0.040570456
EGP_VALUE_OMNIBUS_PERC	-0.178807	0.09795	-1.83	0.068	-0.034320738
ORDER10	-0.00784564	0.01266	-0.62	0.5355	-0.019506185
DS_TOP_PERC	-0.0245306	0.3906	-0.0628	0.9499	-0.001052836
Constant	-0.259697	0.05202	-4.99	0	
VWAP20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0.0254574	0.01603	1.59	0.1123	0.037575657
FOR_INSTIT_EGP_VALUE_PERC	0.0506679	0.05086	0.996	0.3193	0.039813723
EGP_VALUE_T0_PERC	0.704289	0.1778	3.96	0.0001	0.081196011
ORDER20	0.102535	0.01428	7.18	0	0.205547527
FF_PERC	0.600859	0.05726	10.5	0	0.214219808
T M G Holding					
EGP_VALUE_FIX_PERC	-0.0954777	0.01301	-7.34	0	-0.197104175
EGP_VALUE_T0_PERC	-0.144147	0.02447	-5.89	0	-0.154093923

ORDER10	-0.0240701	0.008737	-2.75	0.0059	-0.109519636
FOR_RETAIL_EGP_VALUE_PERC	-0.00233835	0.02927	-0.0799	0.9363	-0.001630735
Constant	-0.0375312	0.03681	-1.02	0.308	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0.0162991	0.01825	0.893	0.3718	0.028427963
DS_TOP_PERC	0.442927	0.2061	2.15	0.0317	0.037241737
EGP_VALUE_OMNIBUS_PERC	0.170287	0.04826	3.53	0.0004	0.063859023
FF_PERC	0.44893	0.07551	5.95	0	0.207799998
EGP_RETAIL_EGP_VALUE_PERC	0.127817	0.01903	6.72	0	0.218871137

Prime Holding					
ORDER20	-0.328731	0.01749	-18.8	0	-0.844112247
ORDER10	-0.185794	0.0172	-10.8	0	-0.505781976
FF_PERC	-0.248379	0.03135	-7.92	0	-0.218643031
EGP_VALUE_OMNIBUS_PERC	-0.486804	0.09028	-5.39	0	-0.108343935
Constant	0.199847	0.05853	3.41	0.0006	
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.0786878	0.3752	0.21	0.8339	0.003710919
EGP_RETAIL_EGP_VALUE_PERC	0.149362	0.05367	2.78	0.0054	0.094418205
EGP_INSTIT_EGP_VALUE_PERC	0.256927	0.06869	3.74	0.0002	0.118484203
FOR_INSTIT_EGP_VALUE_PERC	0.473491	0.08066	5.87	0	0.14371867
EGP_VALUE_NOFIX_PERC	0.105204	0.01351	7.79	0	0.175489818
EGP_VALUE_T0_PERC	0.921922	0.04692	19.6	0	0.409297696

El Nasr For Manufacturing Agricultural Crops					
EGP_VALUE_FIX_PERC	-0.265016	0.2118	-1.25	0.211	-0.381563214
EGP_VALUE_NOFIX_PERC	-0.230029	0.2127	-1.08	0.2795	-0.331310476
ORDER10	-0.048842	0.01405	-3.48	0.0005	-0.123447178
FF_PERC	-0.215917	0.1434	-1.51	0.1322	-0.030568537
EGP_VALUE_OMNIBUS_PERC	-0.297918	0.39	-0.764	0.445	-0.014556871
EGP_VALUE_T0_PERC	-0.0963091	0.1262	-0.763	0.4453	-0.014545245
FOR_RETAIL_EGP_VALUE_PERC	-0.048476	0.1341	-0.361	0.7179	-0.01271309
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.240847	0.1864	1.29	0.1964	
VWAP20	0	0			0
DS_TOP_PERC	1.37351	0.4864	2.82	0.0048	0.051763949
EGP_INSTIT_EGP_VALUE_PERC	0.302136	0.1488	2.03	0.0424	0.060081075
EGP_RETAIL_EGP_VALUE_PERC	0.183253	0.1095	1.67	0.0943	0.071314384
ORDER20	0.0581006	0.01247	4.66	0	0.12102682

EL Ezz Aldekhela Steel - Alexandria				
EGP_RETAIL_EGP_VALUE_PERC	-0.221954	0.1038	-2.14	0.0325	-0.567663106
FOR_INSTIT_EGP_VALUE_PERC	-0.244481	0.1041	-2.35	0.0189	-0.43463158
EGP_INSTIT_EGP_VALUE_PERC	-0.224283	0.1042	-2.15	0.0314	-0.403053349
FOR_RETAIL_EGP_VALUE_PERC	-0.235341	0.1053	-2.23	0.0255	-0.206220673
ORDER10	-0.0375273	0.009428	-3.98	0.0001	-0.168359779
VWAP20	-0.00411596	0.008942	-0.46	0.6453	-0.016921265
EGP_VALUE_OMNIBUS_PERC	-0.0259246	0.03782	-0.686	0.4931	-0.011230738
EGP_VALUE_FIX_PERC	0	0			0
Constant	0.136338	0.1042	1.31	0.1908	
DS_TOP_PERC	0.172258	0.6725	0.256	0.7979	0.004087727
ORDER20	0.0029596	0.009725	0.304	0.7609	0.009834202
EGP_VALUE_NOFIX_PERC	0.0379203	0.008847	4.29	0	0.103530701
EGP_VALUE_T0_PERC	1.34305	0.134	10	0	0.163721931
FF_PERC	0.296569	0.01467	20.2	0	0.379720188
Maridive & oil services				
EGP_VALUE_FIX_PERC	-0.140938	0.01516	-9.3	0	-0.235674384
FF_PERC	-0.18198	0.02874	-6.33	0	-0.129259877
EGP_RETAIL_EGP_VALUE_PERC	-0.0412644	0.02315	-1.78	0.0748	-0.067080898
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.192625	0.02167	8.89	0	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0.0136968	0.03993	0.343	0.7316	0.007162541
DS_TOP_PERC	0.62722	0.67	0.936	0.3492	0.016122159
EGP_VALUE_T0_PERC	0.351386	0.1156	3.04	0.0024	0.058872388
EGP_VALUE_OMNIBUS_PERC	0.162076	0.04794	3.38	0.0007	0.064339862
FOR_INSTIT_EGP_VALUE_PERC	0.124631	0.02637	4.73	0	0.147817313
ORDER10	0.0652181	0.00971	6.72	0	0.181264914
United Arab Shipping				
EGP_VALUE_NOFIX_PERC	-0.017828	0.0109	-1.63	0.1021	-0.047219964
VWAP20	0	0			0
Constant	-0.164469	0.08837	-1.86	0.0628	
EGP_VALUE_FIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.246845	0.2602	0.949	0.3429	0.011052299
DS_TOP_PERC	0.158435	0.15	1.06	0.291	0.012174081
FF_PERC	0.0377272	0.03393	1.11	0.2663	0.032133196
FOR_RETAIL_EGP_VALUE_PERC	0.135345	0.09372	1.44	0.1488	0.052599237
EGP_INSTIT_EGP_VALUE_PERC	0.183931	0.09647	1.91	0.0567	0.05374948

EGP_RETAIL_EGP_VALUE_PERC	0.12895	0.08684	1.48	0.1377	0.066572842
EGP_VALUE_T0_PERC	0.317995	0.03083	10.3	0	0.140717059
ORDER20	0.237655	0.006879	34.5	0	0.758097213
ORDER10	0.276727	0.009717	28.5	0	1.215067374
Paint & Chemicals Industries (Pachin)					
VWAP20	-0.145793	0.007268	-20.1	0.0000	-0.52010423
ORDER10	-0.0745676	0.006599	-11.3	0	-0.263875066
EGP_VALUE_NOFIX_PERC	-0.0961067	0.01058	-9.08	0	-0.20619433
FOR_INSTIT_EGP_VALUE_PERC	-0.139829	0.01814	-7.71	0	-0.202235791
EGP_INSTIT_EGP_VALUE_PERC	-0.093693	0.01753	-5.34	0	-0.134410054
EGP_RETAIL_EGP_VALUE_PERC	-0.0432371	0.01573	-2.75	0.006	-0.089486058
EGP_VALUE_OMNIBUS_PERC	-0.0104278	0.05113	-0.204	0.8384	-0.002935061
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
Constant	-0.0374079	0.01957	-1.91	0.056	
DS_TOP_PERC	0.916106	0.6156	1.49	0.1368	0.02081087
EGP_VALUE_T0_PERC	0.961753	0.1079	8.91	0	0.130170093
FF_PERC	0.499054	0.02764	18.1	0	0.308350311
Misr Duty Free Shops					
FF_PERC	-0.585265	0.224	-2.61	0.009	-0.188388885
EGP_VALUE_NOFIX_PERC	-0.111582	0.01599	-6.98	0	-0.160971758
FOR_INSTIT_EGP_VALUE_PERC	-0.0804433	0.04573	-1.76	0.0786	-0.048327437
FOR_RETAIL_EGP_VALUE_PERC	-0.0652951	0.04574	-1.43	0.1535	-0.037109609
EGP_RETAIL_EGP_VALUE_PERC	-0.0356879	0.03792	-0.941	0.3467	-0.031258331
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.117324	0.04753	2.47	0.0136	
VWAP20	0	0			0
DS_TOP_PERC	0.43423	0.7875	0.551	0.5814	0.008232122
EGP_VALUE_T0_PERC	1.71438	0.3926	4.37	0	0.065558155
ORDER10	0.0655483	0.03776	1.74	0.0827	0.148903409
ORDER20	0.326924	0.03756	8.7	0	0.513285567
Suez Cement					
EGP_INSTIT_EGP_VALUE_PERC	-0.0262405	0.01972	-1.33	0.1833	-0.043941456
FOR_INSTIT_EGP_VALUE_PERC	-0.0212703	0.01947	-1.09	0.2746	-0.038683841
EGP_VALUE_OMNIBUS_PERC	-0.0361906	0.02997	-1.21	0.2273	-0.018185062
EGP_RETAIL_EGP_VALUE_PERC	-0.00162771	0.01825	-0.0892	0.929	-0.004047077
Constant	-0.169378	0.01866	-9.08	0	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0

EGP_VALUE_NOFIX_PERC	0	0			0
DS_TOP_PERC	0.474094	0.8238	0.576	0.565	0.008079349
EGP_VALUE_T0_PERC	1.1196	0.2287	4.89	0	0.069681258
EGP_VALUE_FIX_PERC	0.0330859	0.008791	3.76	0.0002	0.088938932
FF_PERC	0.126379	0.01411	8.96	0	0.15530666
VWAP20	0.0667698	0.005912	11.3	0.0000	0.267494227
ORDER10	0.0898796	0.00697	12.9	0	0.380998834
ORDER20	0.135076	0.007036	19.2	0	0.382032246
Misr Cement (Qena)					
EGP_INSTIT_EGP_VALUE_PERC	-0.125359	0.0222	-5.65	0	-0.183457429
ORDER10	-0.0460654	0.008377	-5.5	0	-0.141572566
EGP_VALUE_OMNIBUS_PERC	-0.314897	0.06876	-4.58	0	-0.064742187
FOR_INSTIT_EGP_VALUE_PERC	-0.0310213	0.02799	-1.11	0.2678	-0.022189414
Constant	-0.133279	0.02176	-6.13	0	
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	1.05907	1.269	0.835	0.404	0.011629449
EGP_RETAIL_EGP_VALUE_PERC	0.0068414	0.02091	0.327	0.7436	0.011633051
VWAP20	0.0443772	0.007976	5.56	0.0000	0.133484307
EGP_VALUE_T0_PERC	1.13991	0.1119	10.2	0	0.148864424
FF_PERC	0.166503	0.0148	11.3	0	0.184139203
EGP_VALUE_FIX_PERC	0.124873	0.01185	10.5	0	0.217762363
GB AUTO					
ORDER10	-0.120322	0.0078	-15.4	0	-0.348557183
EGP_VALUE_OMNIBUS_PERC	-0.0363626	0.0314	-1.16	0.2469	-0.018869889
Constant	-0.0624496	0.02041	-3.06	0.0022	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0.000493526	0.01688	0.0292	0.9767	0.000824117
DS_TOP_PERC	0.95245	0.467	2.04	0.0415	0.030012902
EGP_VALUE_NOFIX_PERC	0.0295544	0.01185	2.5	0.0127	0.052972801
EGP_RETAIL_EGP_VALUE_PERC	0.0476265	0.01613	2.95	0.0032	0.085151057
FOR_RETAIL_EGP_VALUE_PERC	0.263984	0.03224	8.19	0	0.136866301
EGP_VALUE_T0_PERC	0.422166	0.03542	11.9	0	0.205808444
FF_PERC	0.424576	0.02018	21	0	0.453568117
Ceramic & Porcelain					
FF_PERC	-0.874277	0.1332	-6.57	0	-0.229901549
EGP_RETAIL_EGP_VALUE_PERC	-0.676385	0.2585	-2.62	0.0089	-0.163234308

EGP_INSTIT_EGP_VALUE_PERC	-0.721114	0.2785	-2.59	0.0096	-0.143109337
FOR_RETAIL_EGP_VALUE_PERC	-0.447789	0.2969	-1.51	0.1316	-0.051244152
EGP_VALUE_OMNIBUS_PERC	-0.197441	0.2629	-0.751	0.4527	-0.013762541
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.434018	0.4143	-1.05	0.2949	
DS_TOP_PERC	0.0880714	0.8357	0.105	0.9161	0.001776736
EGP_VALUE_T0_PERC	0.454385	0.1144	3.97	0.0001	0.073185536
VWAP20	1.61738	0.4396	3.68	0.0002	0.087161135
EGP_VALUE_NOFIX_PERC	0.366943	0.04138	8.87	0	0.312321772
ORDER20	1.34398	0.3145	4.27	0	1.504610989
ORDER10	1.44722	0.3144	4.6	0	2.205660412
General Silos & Storage					
EGP_VALUE_NOFIX_PERC	-0.212842	0.01135	-18.8	0	-0.397372729
EGP_RETAIL_EGP_VALUE_PERC	-0.0666437	0.02313	-2.88	0.004	-0.064208506
FOR_RETAIL_EGP_VALUE_PERC	-0.0114529	0.03584	-0.32	0.7493	-0.004619224
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.0107466	0.02628	-0.409	0.6826	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.393318	0.3933	1	0.3174	0.011041543
EGP_VALUE_OMNIBUS_PERC	0.58383	0.3119	1.87	0.0613	0.020687489
EGP_INSTIT_EGP_VALUE_PERC	0.0473654	0.02728	1.74	0.0826	0.035252268
EGP_VALUE_T0_PERC	0.332522	0.05478	6.07	0	0.075762899
FF_PERC	0.554767	0.0345	16.1	0	0.193102335
ORDER20	0.117666	0.007554	15.6	0	0.257295902
VWAP20	0.111738	0.005894	19	0.0000	0.33085103
ORDER10	0.1514	0.008244	18.4	0	0.482475964
The Arab Ceramic CO.- Ceramica Remas					
ORDER10	-0.110119	0.008139	-13.5	0	-0.423369866
EGP_VALUE_OMNIBUS_PERC	-0.0737818	0.06936	-1.06	0.2875	-0.016992748
Constant	-0.302615	0.0257	-11.8	0	
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0.00284816	0.02759	0.103	0.9178	0.002497822
DS_TOP_PERC	0.577135	0.799	0.722	0.4701	0.011072486
FOR_RETAIL_EGP_VALUE_PERC	0.0195709	0.02652	0.738	0.4605	0.017370747
EGP_RETAIL_EGP_VALUE_PERC	0.0939449	0.02041	4.6	0	0.135829639
EGP_VALUE_T0_PERC	0.643533	0.06114	10.5	0	0.164913204
ORDER20	0.0696996	0.006612	10.5	0	0.194397107
EGP_VALUE_FIX_PERC	0.0854995	0.01025	8.34	0	0.199422508
FF_PERC	1.0273	0.06796	15.1	0	0.369446097

Abou Kir Fertilizers					
EGP_RETAIL_EGP_VALUE_PERC	-0.0916457	0.07799	-1.18	0.24	-0.162992972
EGP_INSTIT_EGP_VALUE_PERC	-0.0878942	0.07804	-1.13	0.2601	-0.153520135
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	-0.0887296	0.07828	-1.13	0.257	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.105796	0.6635	0.159	0.8733	0.002171405
ORDER10	0.0173282	0.008132	2.13	0.0331	0.053867157
FOR_INSTIT_EGP_VALUE_PERC	0.175348	0.0844	2.08	0.0378	0.079752917
EGP_VALUE_OMNIBUS_PERC	0.345134	0.05472	6.31	0	0.090974482
FF_PERC	0.162559	0.02925	5.56	0	0.097368041
EGP_VALUE_FIX_PERC	0.0795978	0.01309	6.08	0	0.125997615
VWAP20	0.109284	0.00795	13.7	0	0.290317055
EGP_VALUE_T0_PERC	1.57222	0.07504	21	0	0.318647217
Alexandria Containers and goods					
ORDER10	-0.0410202	0.009528	-4.31	0	-0.128625249
EGP_VALUE_OMNIBUS_PERC	-0.386746	0.0651	-5.94	0	-0.108663271
EGP_VALUE_T0_PERC	-0.0184015	0.1111	-0.166	0.8684	-0.002848204
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
Constant	-0.164993	0.16	-1.03	0.3024	
FF_PERC	1.39055	1.356	1.03	0.3052	0.017783626
DS_TOP_PERC	1.0765	0.567	1.9	0.0577	0.031907273
FOR_RETAIL_EGP_VALUE_PERC	0.319028	0.1534	2.08	0.0377	0.138734284
EGP_RETAIL_EGP_VALUE_PERC	0.108741	0.1488	0.731	0.4651	0.147765684
EGP_VALUE_FIX_PERC	0.0790503	0.01453	5.44	0	0.150854751
FOR_INSTIT_EGP_VALUE_PERC	0.158803	0.1498	1.06	0.2891	0.164404357
EGP_INSTIT_EGP_VALUE_PERC	0.265935	0.1507	1.76	0.0778	0.191316009
ORDER20	0.111428	0.009283	12	0	0.237017217
cairo Pharmaceuticals					
ORDER10	-0.159793	0.005533	-28.9	0	-0.579723646
VWAP20	-0.269287	0.007343	-36.7	0.0000	-0.565872634
EGP_VALUE_FIX_PERC	-0.0208257	0.00762	-2.73	0.0063	-0.048670906
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
Constant	-0.631549	0.03047	-20.7	0	
DS_TOP_PERC	0.475308	0.3725	1.28	0.202	0.013637019
EGP_VALUE_OMNIBUS_PERC	0.167601	0.06839	2.45	0.0143	0.026927698
FOR_RETAIL_EGP_VALUE_PERC	0.048166	0.02481	1.94	0.0523	0.031119361

EGP_RETAIL_EGP_VALUE_PERC	0.0520024	0.01872	2.78	0.0055	0.071526601
EGP_INSTIT_EGP_VALUE_PERC	0.0670998	0.02155	3.11	0.0019	0.072313849
EGP_VALUE_T0_PERC	0.959305	0.1062	9.03	0	0.101128974
FF_PERC	2.56901	0.09092	28.3	0	0.383156483
Sharm Dreams Co. for Tourism Investment					
EGP_INSTIT_EGP_VALUE_PERC	-0.307192	0.201	-1.53	0.1265	-0.168521963
EGP_RETAIL_EGP_VALUE_PERC	-0.168075	0.1993	-0.843	0.399	-0.103704474
EGP_VALUE_FIX_PERC	-0.0309269	0.01853	-1.67	0.0953	-0.048589056
Constant	0.137014	0.1981	0.692	0.4893	
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
ORDER20	0.00892322	0.01052	0.849	0.3962	0.018160439
EGP_VALUE_OMNIBUS_PERC	0.47972	0.3063	1.57	0.1174	0.025947219
ORDER10	0.0153301	0.01195	1.28	0.1996	0.0401612
DS_TOP_PERC	1.97025	0.5432	3.63	0.0003	0.0596542
FOR_INSTIT_EGP_VALUE_PERC	0.350147	0.2135	1.64	0.1011	0.071115784
EGP_VALUE_T0_PERC	0.77941	0.07927	9.83	0	0.202814062
FF_PERC	0.309289	0.03208	9.64	0	0.265063501

Table 11.3: Category C Regressions Summary

Company Name	Coefficient	Std.Error	t-value	t-prob	Standardized Coefficients
Faisal Islamic Bank of Egypt - In US Dollars					
FF_PERC	-0.51698	0.05315	-9.73	0	-0.187370003
FOR_RETAIL_EGP_VALUE_PERC	-0.14009	0.05171	-2.71	0.0068	-0.076723859
EGP_RETAIL_EGP_VALUE_PERC	-0.07948	0.04253	-1.87	0.0617	-0.058638152
EGP_VALUE_FIX_PERC	-0.04838	0.02297	-2.11	0.0352	-0.053129186
EGP_INSTIT_EGP_VALUE_PERC	-0.05217	0.0637	-0.819	0.4129	-0.018518023
EGP_VALUE_OMNIBUS_PERC	-0.18709	0.2066	-0.905	0.3653	-0.014814787
DS_TOP_PERC	-1.18293	1.919	-0.616	0.5376	-0.009752436
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0
Constant	0.08383	0.07228	1.16	0.2462	
VWAP20	0	0			0
ORDER20	0.26361	0.05512	4.78	0	0.338239079
ORDER10	0.18922	0.05444	3.48	0.0005	0.344765745
Modern Company for water proofing (Bitumode)					
DS_TOP_PERC	-1.71069	0.1323	-12.9	0.0000	-0.183178842
EGP_RETAIL_EGP_VALUE_PERC	-0.09422	0.018	-5.23	0	-0.173700347
FOR_INSTIT_EGP_VALUE_PERC	-0.05846	0.024	-2.44	0.015	-0.060417442
FOR_RETAIL_EGP_VALUE_PERC	-0.02953	0.02283	-1.29	0.1959	-0.029053572
Constant	0.1061	0.0178	5.96	0	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
ORDER10	0	0			0
EGP_VALUE_T0_PERC	0.05538	0.03139	1.76	0.0778	0.025622827
EGP_VALUE_OMNIBUS_PERC	0.24606	0.06786	3.63	0.0003	0.053077722
EGP_VALUE_FIX_PERC	0.02673	0.003754	7.12	0	0.123709493
FF_PERC	0.14768	0.004624	31.9	0	0.666755606
Nasr Company for Civil Works					
ORDER10	-0.14093	0.005209	-27.1	0	-0.643275139
EGP_INSTIT_EGP_VALUE_PERC	-0.28767	0.03844	-7.48	0	-0.267137118
EGP_RETAIL_EGP_VALUE_PERC	-0.1507	0.03522	-4.28	0	-0.172397867
FF_PERC	-0.3215	0.0598	-5.38	0	-0.135222359

FOR_INSTIT_EGP_VALUE_PERC	-0.10299	0.04198	-2.45	0.0142	-0.061810911
DS_TOP_PERC	-0.44427	0.385	-1.15	0.2486	-0.01631442
EGP_VALUE_OMNIBUS_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
Constant	0.38945	0.03829	10.2	0	
VWAP20	0	0			0
ORDER20	0	0			0
EGP_VALUE_T0_PERC	0.10606	0.07821	1.36	0.1752	0.02010935
EGP_VALUE_NOFIX_PERC	0.02533	0.00867	2.92	0.0035	0.0689276
Cairo Oils & Soap					
EGP_RETAIL_EGP_VALUE_PERC	-1.02389	0.09157	-11.2	0	-0.371982763
EGP_INSTIT_EGP_VALUE_PERC	-0.90571	0.1166	-7.77	0	-0.219530182
FOR_RETAIL_EGP_VALUE_PERC	-0.88374	0.1244	-7.1	0	-0.175978396
ORDER10	-0.06851	0.013	-5.27	0	-0.136623912
DS_TOP_PERC	-2.88558	0.7071	-4.08	0.0000	-0.062261055
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
Constant	0.94366	0.09189	10.3	0	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.57655	1.404	0.411	0.6815	0.006277319
EGP_VALUE_FIX_PERC	0.02412	0.02089	1.15	0.2483	0.028224053
FF_PERC	0.74593	0.08764	8.51	0	0.236878425
EGP_VALUE_T0_PERC	2.60362	0.1157	22.5	0	0.422294823
East Delta Flour Mills					
FF_PERC	-0.38887	0.04497	-8.65	0	-0.268486484
ORDER10	-0.00426	0.01065	-0.4	0.689	-0.019006605
DS_TOP_PERC	-1.05351	1.118	-0.942	0.3460	-0.014199224
Constant	-0.0509	0.02909	-1.75	0.0802	
EGP_VALUE_NOFIX_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.26262	0.07951	3.3	0.001	0.050133476
FOR_INSTIT_EGP_VALUE_PERC	0.11667	0.03618	3.23	0.0013	0.055334203
EGP_INSTIT_EGP_VALUE_PERC	0.05896	0.01965	3	0.0027	0.093207263
EGP_RETAIL_EGP_VALUE_PERC	0.05323	0.01723	3.09	0.002	0.097761655
EGP_VALUE_FIX_PERC	0.041	0.0083	4.94	0	0.120654634
ORDER20	0.0582	0.008918	6.53	0	0.182291447
VWAP20	0.12007	0.007483	16	0.0000	0.53764127

Misr Beni Suef Cement					
FF_PERC	-0.22774	0.01953	-11.7	0	-0.19770523
EGP_VALUE_FIX_PERC	-0.03144	0.01123	-2.8	0.0051	-0.063016131
EGP_VALUE_T0_PERC	-1.2914	1.076	-1.2	0.2301	-0.016783513
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	-0.24782	0.01924	-12.9	0	
EGP_VALUE_OMNIBUS_PERC	0.00586	0.07392	0.0793	0.9368	0.001122145
DS_TOP_PERC	0.19897	1.062	0.187	0.8513	0.002618504
EGP_INSTIT_EGP_VALUE_PERC	0.00564	0.01727	0.326	0.7441	0.007334349
FOR_RETAIL_EGP_VALUE_PERC	0.212	0.0262	8.09	0	0.128042072
EGP_RETAIL_EGP_VALUE_PERC	0.18097	0.01286	14.1	0	0.32850006
ORDER10	0.14803	0.01513	9.78	0	0.474599576
VWAP20	0.15642	0.01451	10.8	0.0000	0.502667498
ORDER20	0.23407	0.01509	15.5	0	0.527214168
Export Development Bank of Egypt (EDBE)					
FF_PERC	-2.66706	0.1709	-15.6	0	-0.262226814
VWAP20	-0.03867	0.006652	-5.81	0.0000	-0.142919696
EGP_VALUE_NOFIX_PERC	-0.05764	0.01113	-5.18	0	-0.111619503
EGP_VALUE_OMNIBUS_PERC	-0.00808	0.03143	-0.257	0.7972	-0.003956863
Constant	0.31604	0.09496	3.33	0.0009	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
DS_TOP_PERC	0.5368	0.7129	0.753	0.4515	0.010252605
EGP_VALUE_T0_PERC	0.27131	0.07728	3.51	0.0005	0.048525667
FOR_INSTIT_EGP_VALUE_PERC	0.45717	0.09517	4.8	0	0.142369642
ORDER10	0.0781	0.006461	12.1	0	0.291849371
EGP_INSTIT_EGP_VALUE_PERC	0.28477	0.08221	3.46	0.0005	0.409347356
EGP_RETAIL_EGP_VALUE_PERC	0.30588	0.08189	3.74	0.0002	0.448965491
Egyptian International Pharmaceuticals (EIPICO)					
FF_PERC	-0.25235	0.02099	-12	0	-0.210457187
FOR_INSTIT_EGP_VALUE_PERC	-0.05471	0.01179	-4.64	0	-0.180994562
EGP_RETAIL_EGP_VALUE_PERC	-0.03881	0.01176	-3.3	0.001	-0.14423938
EGP_INSTIT_EGP_VALUE_PERC	-0.04903	0.01209	-4.06	0.0001	-0.129250119
EGP_VALUE_NOFIX_PERC	-0.0322	0.005276	-6.1	0	-0.111359371
ORDER20	-0.01359	0.007097	-1.92	0.0555	-0.050828249
EGP_VALUE_OMNIBUS_PERC	-0.00417	0.01705	-0.245	0.8066	-0.003176705

FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.03358	0.01556	-2.16	0.0309	
DS_TOP_PERC	0.11484	0.35	0.328	0.7429	0.004081406
ORDER10	0.02371	0.007338	3.23	0.0012	0.125011587
VWAP20	0.11558	0.006151	18.8	0.0000	0.615852616
National company for maize products					
ORDER10	-0.16026	0.01038	-15.4	0	-0.418242279
EGP_INSTIT_EGP_VALUE_PERC	-0.11216	0.03579	-3.13	0.0017	-0.142501466
EGP_VALUE_OMNIBUS_PERC	-0.24364	0.05668	-4.3	0	-0.087265882
EGP_VALUE_FIX_PERC	-0.03202	0.1332	-0.24	0.8101	-0.059122587
FOR_INSTIT_EGP_VALUE_PERC	-0.04969	0.03819	-1.3	0.1933	-0.046026447
EGP_VALUE_T0_PERC	-0.10691	0.07715	-1.39	0.166	-0.033553362
ORDER20	0	0			0
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.14294	0.1301	1.1	0.272	
DS_TOP_PERC	0.17922	0.3697	0.485	0.6279	0.009371534
EGP_RETAIL_EGP_VALUE_PERC	0.02334	0.03231	0.722	0.4701	0.03924748
EGP_VALUE_NOFIX_PERC	0.02236	0.1333	0.168	0.8668	0.041291965
FF_PERC	0.17356	0.01902	9.13	0	0.196956946
Belton Financial Holding					
FOR_INSTIT_EGP_VALUE_PERC	-0.33619	0.06547	-5.14	0	-0.200688458
EGP_VALUE_OMNIBUS_PERC	-0.44906	0.1719	-2.61	0.0091	-0.063217183
FF_PERC	-0.06719	0.02749	-2.44	0.0146	-0.055619199
VWAP20	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.01522	0.05344	-0.285	0.7759	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
ORDER10	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0.0191	0.08392	0.228	0.82	0.007298594
DS_TOP_PERC	0.44448	0.4879	0.911	0.3624	0.020252514
EGP_VALUE_NOFIX_PERC	0.08613	0.02313	3.72	0.0002	0.088327216
EGP_VALUE_T0_PERC	0.34774	0.0706	4.93	0	0.115263002
EGP_RETAIL_EGP_VALUE_PERC	0.22596	0.05446	4.15	0	0.182968101
Citadel Capital - Common Shares					
FF_PERC	-0.00096	0.0000233 2	-41.1	0	-0.449179541

EGP_VALUE_FIX_PERC	-0.00048	0.00003132	-15.3	0	-0.18306043
EGP_VALUE_T0_PERC	-0.00121	0.00005626	-21.6	0	-0.177593906
FOR_RETAIL_EGP_VALUE_PERC	-4E-05	0.00006845	-0.577	0.5638	-0.00590657
EGP_VALUE_NOFIX_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.2988	0.00004952	6034	0	
ORDER10	0	0			0
VWAP20	0	0			0
DS_TOP_PERC	3.2E-05	0.0006731	0.0479	0.9618	0.00032163
EGP_VALUE_OMNIBUS_PERC	0.00024	0.0001048	2.25	0.0244	0.017585277
EGP_RETAIL_EGP_VALUE_PERC	0.00035	0.00005194	6.76	0	0.113829543
FOR_INSTIT_EGP_VALUE_PERC	0.00047	0.00005409	8.67	0	0.13435918
ORDER20	0.00052	0.00001342	38.8	0	0.360691739
Gulf Canadian Real Estate Investment Co.					
FF_PERC	-0.4649	0.02512	-18.5	0	-0.817374502
FOR_RETAIL_EGP_VALUE_PERC	-0.16941	0.08505	-1.99	0.0465	-0.070289173
EGP_RETAIL_EGP_VALUE_PERC	-0.05781	0.0696	-0.831	0.4062	-0.03318032
Constant	0.26587	0.07235	3.67	0.0002	
VWAP20	0	0			0
ORDER20	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
EGP_VALUE_T0_PERC	0.00907	0.1248	0.0727	0.942	0.001237908
EGP_INSTIT_EGP_VALUE_PERC	0.03897	0.0981	0.397	0.6912	0.010407288
DS_TOP_PERC	0.28909	0.3558	0.812	0.4166	0.013061718
EGP_VALUE_OMNIBUS_PERC	0.14142	0.1673	0.845	0.398	0.01475764
EGP_VALUE_NOFIX_PERC	0.10395	0.01413	7.36	0	0.218935948
ORDER10	0.18922	0.01026	18.4	0	0.645269543
Mansourah Poultry					
FF_PERC	-0.06158	0.00234	-26.3	0	-0.379099202
EGP_VALUE_NOFIX_PERC	-0.00374	0.001814	-2.06	0.0392	-0.036866064
DS_TOP_PERC	-0.21616	0.05991	-3.61	0.0003	-0.036599511
Constant	0.0194	0.00764	2.54	0.0112	
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0

FOR_INSTIT_EGP_VALUE_PERC	0.03423	0.02389	1.43	0.1521	0.01493894
EGP_INSTIT_EGP_VALUE_PERC	0.0083	0.007218	1.15	0.2501	0.021719356
EGP_VALUE_OMNIBUS_PERC	0.14141	0.05734	2.47	0.0137	0.02526459
EGP_RETAIL_EGP_VALUE_PERC	0.00909	0.005958	1.53	0.1272	0.029084886
EGP_VALUE_T0_PERC	0.2063	0.01393	14.8	0	0.157569575
ORDER20	0.10942	0.004682	23.4	0	1.466469461
ORDER10	0.10528	0.00477	22.1	0	1.740991982
Amer Group Holding					
EGP_VALUE_FIX_PERC	-0.20121	0.01209	-16.6	0	-0.350483918
ORDER10	-0.20452	0.0122	-16.8	0	-0.287974321
FF_PERC	-0.11892	0.01357	-8.76	0	-0.180539011
FOR_RETAIL_EGP_VALUE_PERC	-0.06976	0.03679	-1.9	0.0581	-0.036859685
DS_TOP_PERC	-0.25039	0.2468	-1.01	0.3104	-0.016293896
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
Constant	0.41108	0.02069	19.9	0	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.11227	0.06355	1.77	0.0774	0.031748657
EGP_RETAIL_EGP_VALUE_PERC	0.07384	0.02124	3.48	0.0005	0.100627482
FOR_INSTIT_EGP_VALUE_PERC	0.11827	0.02752	4.3	0	0.108613026
EGP_VALUE_T0_PERC	0.4947	0.02061	24	0	0.407688867
Rubex International for Plastic and Acrylic Manufacturing					
ORDER10	-0.1469	0.03625	-4.05	0.0001	-0.538639141
EGP_RETAIL_EGP_VALUE_PERC	-0.21077	0.05026	-4.19	0	-0.140973696
ORDER20	-0.03879	0.03606	-1.08	0.2822	-0.119790332
EGP_VALUE_FIX_PERC	-0.05266	0.0096	-5.49	0	-0.112665808
FOR_RETAIL_EGP_VALUE_PERC	-0.08902	0.06508	-1.37	0.1715	-0.033147315
EGP_INSTIT_EGP_VALUE_PERC	-0.05716	0.05976	-0.957	0.3389	-0.027300781
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0
Constant	0.30642	0.06263	4.89	0	
VWAP20	0	0			0
DS_TOP_PERC	0.21049	0.312	0.675	0.5000	0.010172609
EGP_VALUE_OMNIBUS_PERC	0.50088	0.1073	4.67	0	0.074111368
FF_PERC	0.18959	0.01854	10.2	0	0.290655254
Universal For Paper and Packaging Materials (Unipack					
EGP_VALUE_FIX_PERC	-0.0592	0.01235	-4.79	0	-0.126850833
EGP_VALUE_T0_PERC	-0.01067	0.08883	-0.12	0.9044	-0.002299079

EGP_VALUE_NOFIX_PERC	0	0			0
Constant	-0.09766	0.04165	-2.34	0.0191	
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.02655	0.3399	0.0781	0.9377	0.001457107
EGP_INSTIT_EGP_VALUE_PERC	0.0151	0.05184	0.291	0.7709	0.009344006
EGP_VALUE_OMNIBUS_PERC	0.45359	0.3858	1.18	0.2398	0.021916784
FOR_INSTIT_EGP_VALUE_PERC	0.1193	0.08078	1.48	0.1398	0.033396406
ORDER20	0.01263	0.009749	1.3	0.1951	0.043928209
FF_PERC	0.05603	0.009434	5.94	0	0.12819484
EGP_RETAIL_EGP_VALUE_PERC	0.22817	0.04214	5.41	0	0.182912587
ORDER10	0.0551	0.01032	5.34	0	0.218935747
Rakta Paper Manufacturing					
EGP_RETAIL_EGP_VALUE_PERC	-0.13213	0.0337	-3.92	0.0001	-0.06389252
FOR_RETAIL_EGP_VALUE_PERC	-0.20407	0.04637	-4.4	0	-0.063826204
FF_PERC	-0.10068	0.1199	-0.84	0.401	-0.042877083
DS_TOP_PERC	-0.11405	0.2393	-0.477	0.6337	-0.004863226
EGP_VALUE_OMNIBUS_PERC	-0.10244	0.3473	-0.295	0.7681	-0.00304488
Constant	0.12924	0.0983	1.31	0.1887	
VWAP20	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_T0_PERC	0.41171	0.04626	8.9	0	0.095920395
FOR_INSTIT_EGP_VALUE_PERC	0.53312	0.06947	7.67	0	0.103508146
EGP_VALUE_NOFIX_PERC	0.07566	0.01004	7.54	0	0.163160365
ORDER20	0.14826	0.0911	1.63	0.1037	0.355854603
ORDER10	0.18401	0.09197	2	0.0455	0.658194067
Al Arafa For Investment And Consultancies					
FF_PERC	-0.17988	0.03448	-5.22	0	-64893897.86
EGP_RETAIL_EGP_VALUE_PERC	-0.02962	0.01649	-1.8	0.0725	-830136.7676
Constant	-0.09889	0.02133	-4.64	0	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0.16257	0.008022	20.3	0	0
FOR_RETAIL_EGP_VALUE_PERC	0.01508	0.0213	0.708	0.479	0.018359492
FOR_INSTIT_EGP_VALUE_PERC	0.01885	0.02138	0.882	0.3781	0.021098613
EGP_VALUE_OMNIBUS_PERC	0.01517	0.03493	0.434	0.6641	0.037474789
EGP_VALUE_NOFIX_PERC	0.03224	0.009311	3.46	0.0005	0.079625064
ORDER10	0.04001	0.008162	4.9	0	0.122727685

EGP_VALUE_T0_PERC	0.62471	0.4705	1.33	0.1843	0.821336327
DS_TOP_PERC	0.24392	0.5283	0.462	0.6443	0.956911702

Egyptians Housing Development & Reconstruction

EGP_RETAIL_EGP_VALUE_PERC	-0.34662	0.0572	-6.06	0	-0.418009963
EGP_INSTIT_EGP_VALUE_PERC	-0.36701	0.05869	-6.25	0	-0.378623312
FOR_RETAIL_EGP_VALUE_PERC	-0.23925	0.06312	-3.79	0.0002	-0.134243234
EGP_VALUE_T0_PERC	-0.06489	0.01587	-4.09	0	-0.084537544
Constant	0.19925	0.05969	3.34	0.0009	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.05009	0.118	0.424	0.6713	0.006428596
EGP_VALUE_OMNIBUS_PERC	0.99699	0.6289	1.59	0.113	0.023865576
FF_PERC	0.06124	0.01231	4.98	0	0.085724879
ORDER10	0.01369	0.004531	3.02	0.0025	0.090734692
EGP_VALUE_FIX_PERC	0.26919	0.08243	3.27	0.0011	0.998526058
EGP_VALUE_NOFIX_PERC	0.36328	0.08218	4.42	0	1.347761439

Arabia Investments Holding

EGP_VALUE_NOFIX_PERC	-0.07151	0.01086	-6.59	0	-0.142764699
FOR_INSTIT_EGP_VALUE_PERC	-0.14472	0.05249	-2.76	0.0059	-0.062722052
EGP_RETAIL_EGP_VALUE_PERC	-0.04432	0.03181	-1.39	0.1636	-0.040825037
EGP_INSTIT_EGP_VALUE_PERC	-0.01744	0.04446	-0.392	0.6948	-0.010689573
DS_TOP_PERC	-0.03869	0.3921	-0.0987	0.9214	-0.001796386
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.24377	0.03086	7.9	0	
ORDER10	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.26108	0.2326	1.12	0.2619	0.020832371
FF_PERC	0.02959	0.008119	3.65	0.0003	0.077777189
ORDER20	0.06425	0.006129	10.5	0	0.219608206
EGP_VALUE_T0_PERC	0.70888	0.03219	22	0	0.46255124

Sharkia National Food

EGP_VALUE_FIX_PERC	-0.20428	0.008961	-22.8	0	-0.562444823
EGP_RETAIL_EGP_VALUE_PERC	-0.07977	0.03347	-2.38	0.0172	-0.065966261
FOR_RETAIL_EGP_VALUE_PERC	-0.03929	0.04023	-0.977	0.3288	-0.025854138
DS_TOP_PERC	-0.21319	0.2141	-0.996	0.3194	-0.015411677
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.14982	0.03685	4.07	0	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0

ORDER20	0	0			0
VWAP20	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0.07537	0.08222	0.917	0.3593	0.015525876
EGP_VALUE_OMNIBUS_PERC	0.43889	0.2068	2.12	0.0339	0.033021168
FF_PERC	0.18877	0.02252	8.38	0	0.169059227
EGP_VALUE_T0_PERC	0.75843	0.05147	14.7	0	0.234424991
ORDER10	0.08061	0.005345	15.1	0	0.379948062
South Cairo & Giza Mills & Bakeries					
VWAP20	-0.19291	0.01003	-19.2	0.0000	-0.377818624
ORDER10	-0.06891	0.008315	-8.29	0	-0.216583508
FF_PERC	-0.45811	0.06049	-7.57	0	-0.137436385
EGP_RETAIL_EGP_VALUE_PERC	-0.13	0.03082	-4.22	0	-0.126028339
EGP_VALUE_T0_PERC	-0.37399	0.2271	-1.65	0.0997	-0.025356739
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
Constant	0.32047	0.03592	8.92	0	
FOR_INSTIT_EGP_VALUE_PERC	0.00489	0.08274	0.0591	0.9529	0.000972166
EGP_INSTIT_EGP_VALUE_PERC	0.0181	0.03678	0.492	0.6226	0.015091367
EGP_VALUE_OMNIBUS_PERC	0.20216	0.2008	1.01	0.3142	0.015428987
DS_TOP_PERC	2.05232	0.8696	2.36	0.0183	0.035778741
EGP_VALUE_FIX_PERC	0.03307	0.0123	2.69	0.0072	0.06301771
National Real Estate Bank for Development					
EGP_RETAIL_EGP_VALUE_PERC	-0.19766	0.07633	-2.59	0.0097	-0.101296879
FOR_RETAIL_EGP_VALUE_PERC	-0.24857	0.09487	-2.62	0.0088	-0.063645972
EGP_INSTIT_EGP_VALUE_PERC	-0.08146	0.0824	-0.989	0.3229	-0.033834952
EGP_VALUE_T0_PERC	-0.28526	0.2302	-1.24	0.2154	-0.016626341
EGP_VALUE_FIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
Constant	-0.06858	0.07672	-0.894	0.3715	
EGP_VALUE_OMNIBUS_PERC	0.61097	1.077	0.567	0.5707	0.007600474
DS_TOP_PERC	0.93898	0.1759	5.34	0.0000	0.072373523
FF_PERC	0.19742	0.01005	19.6	0	0.407333556
EGP_VALUE_NOFIX_PERC	0.20324	0.008921	22.8	0	0.421354832
ORDER20	0.17665	0.00933	18.9	0	0.562687725
ORDER10	0.17798	0.009988	17.8	0	0.645222554
Middle & West Delta Flour Mills					
EGP_VALUE_NOFIX_PERC	-0.05029	0.008509	-5.91	0	-0.113643445
FOR_RETAIL_EGP_VALUE_PERC	-0.02574	0.03742	-0.688	0.4916	-0.01550463

EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.37326	0.034	-11	0	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0
DS_TOP_PERC	0.29086	0.5761	0.505	0.6137	0.006189961
EGP_RETAIL_EGP_VALUE_PERC	0.02643	0.03179	0.831	0.4058	0.03685516
EGP_VALUE_OMNIBUS_PERC	0.55367	0.09961	5.56	0	0.068460898
EGP_INSTIT_EGP_VALUE_PERC	0.12649	0.03344	3.78	0.0002	0.158690261
VWAP20	0.07357	0.006626	11.1	0.0000	0.25325842
FF_PERC	0.53084	0.02416	22	0	0.290879598
ORDER20	0.1442	0.007955	18.1	0	0.35268176
ORDER10	0.18367	0.008055	22.8	0	0.652364863
Eastern Company					
FF_PERC	-0.8519	0.05093	-16.7	0	-0.266087324
VWAP20	-0.07759	0.1537	-0.505	0.6137	-0.19409119
FOR_INSTIT_EGP_VALUE_PERC	-0.08381	0.03775	-2.22	0.0265	-0.147565029
EGP_RETAIL_EGP_VALUE_PERC	-0.05212	0.03821	-1.36	0.1726	-0.083057623
ORDER20	-0.00505	0.1539	-0.0328	0.9738	-0.008444987
Constant	0.21083	0.1585	1.33	0.1836	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
DS_TOP_PERC	0.93308	0.6584	1.42	0.1565	0.017560298
EGP_VALUE_OMNIBUS_PERC	0.10173	0.04708	2.16	0.0308	0.027708724
EGP_INSTIT_EGP_VALUE_PERC	0.03163	0.03857	0.82	0.4123	0.036678427
EGP_VALUE_T0_PERC	1.15827	0.3102	3.73	0.0002	0.047151788
EGP_VALUE_FIX_PERC	0.11847	0.01079	11	0	0.202943379
ORDER10	0.15698	0.1539	1.02	0.3078	0.396234746
Egyptian Real Estate Group					
DS_TOP_PERC	-0.01181	0.1585	-0.0745	0.9406	-0.000694359
EGP_VALUE_OMNIBUS_PERC	0	0			0
VWAP20	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	-0.59465	0.07582	-7.84	0	
FOR_RETAIL_EGP_VALUE_PERC	0.10557	0.08119	1.3	0.1936	0.031792
EGP_RETAIL_EGP_VALUE_PERC	0.10648	0.07578	1.41	0.1601	0.040853469
EGP_INSTIT_EGP_VALUE_PERC	0.29627	0.09253	3.2	0.0014	0.056746666
EGP_VALUE_NOFIX_PERC	0.08755	0.009002	9.73	0	0.155549245
EGP_VALUE_T0_PERC	0.78026	0.04041	19.3	0	0.193453396
FF_PERC	0.29929	0.008129	36.8	0	0.5157784

ORDER20	0.3347	0.005252	63.7	0	0.901928975
ORDER10	0.43279	0.005468	79.1	0	1.381499761
Kafr El Zayat Pesticides					
VWAP20	-0.18825	0.01236	-15.2	0.0000	-0.263281294
EGP_VALUE_FIX_PERC	-0.1013	0.01082	-9.37	0	-0.194273926
FF_PERC	-0.14128	0.01854	-7.62	0	-0.139112151
DS_TOP_PERC	-0.26557	0.3526	-0.753	0.4514	-0.010504537
EGP_VALUE_T0_PERC	-0.12979	0.2093	-0.62	0.5353	-0.00865973
Constant	-0.02564	0.06816	-0.376	0.7068	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
ORDER10	0.0047	0.007787	0.604	0.5457	0.015004221
EGP_VALUE_OMNIBUS_PERC	2.40354	0.6321	3.8	0.0001	0.052992368
FOR_RETAIL_EGP_VALUE_PERC	0.10683	0.07133	1.5	0.1343	0.064982466
EGP_INSTIT_EGP_VALUE_PERC	0.11551	0.07097	1.63	0.1037	0.076663964
EGP_RETAIL_EGP_VALUE_PERC	0.17631	0.06789	2.6	0.0095	0.16111599
Qatar National Bank Alahly					
FOR_INSTIT_EGP_VALUE_PERC	-0.02334	0.01895	-1.23	0.2182	-0.048975978
EGP_RETAIL_EGP_VALUE_PERC	-0.01147	0.01854	-0.619	0.5361	-0.027285889
EGP_VALUE_T0_PERC	-0.05039	0.1844	-0.273	0.7847	-0.003522097
EGP_INSTIT_EGP_VALUE_PERC	-0.00076	0.0199	-0.038	0.9697	-0.001146919
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	-0.52513	0.1133	-4.63	0	
EGP_VALUE_FIX_PERC	0	0			0
DS_TOP_PERC	1.73949	1.246	1.4	0.1629	0.017980271
EGP_VALUE_NOFIX_PERC	0.05008	0.008912	5.62	0	0.110870232
FF_PERC	0.99944	0.02978	33.6	0	0.628922052
VWAP20	0.18423	0.1114	1.65	0.0982	0.675127409
ORDER20	0.31607	0.1115	2.83	0.0046	0.80775793
ORDER10	0.3519	0.1115	3.16	0.0016	1.294988264
Arab Aluminum					
ORDER10	-0.21906	0.1062	-2.06	0.0393	-0.533749248
ORDER20	-0.22745	0.106	-2.15	0.032	-0.476270812
EGP_VALUE_FIX_PERC	-0.02827	0.01874	-1.51	0.1316	-0.041082519
FOR_RETAIL_EGP_VALUE_PERC	-0.1381	0.1676	-0.824	0.4099	-0.030791518
EGP_RETAIL_EGP_VALUE_PERC	-0.00674	0.1446	-0.0466	0.9628	-0.002506473
Constant	0.22796	0.1789	1.27	0.2027	
VWAP20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0

FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_OMNIBUS_PERC	1.13601	1.862	0.61	0.5418	0.011481446
EGP_INSTIT_EGP_VALUE_PERC	0.23811	0.1597	1.49	0.136	0.065186197
DS_TOP_PERC	2.11581	0.4905	4.31	0.0000	0.081124948
EGP_VALUE_T0_PERC	0.5663	0.1235	4.59	0	0.088806885
FF_PERC	0.2512	0.04572	5.49	0	0.140503117
AJWA for Food Industries company Egypt					
EGP_VALUE_FIX_PERC	-0.25667	0.02555	-10	0	-0.361537078
ORDER10	-0.03843	0.01369	-2.81	0.0051	-0.100200609
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	-0.14706	0.16	-0.919	0.3583	
ORDER20	0	0			0
VWAP20	0	0			0
DS_TOP_PERC	0.22666	0.2604	0.87	0.3843	0.016410222
EGP_VALUE_OMNIBUS_PERC	3.71085	2.975	1.25	0.2125	0.023739195
EGP_VALUE_T0_PERC	0.19084	0.08112	2.35	0.0187	0.048119915
FOR_RETAIL_EGP_VALUE_PERC	0.12748	0.1673	0.762	0.446	0.048991736
FOR_INSTIT_EGP_VALUE_PERC	0.22014	0.1677	1.31	0.1895	0.093909828
EGP_INSTIT_EGP_VALUE_PERC	0.24511	0.1667	1.47	0.1416	0.095738101
EGP_RETAIL_EGP_VALUE_PERC	0.21222	0.1597	1.33	0.1839	0.145324465
FF_PERC	0.72942	0.05379	13.6	0	0.528181191
Alexandria Cement					
ORDER10	-0.12984	0.01829	-7.1	0	-0.231826917
EGP_VALUE_FIX_PERC	-0.13388	0.02239	-5.98	0	-0.148855858
EGP_RETAIL_EGP_VALUE_PERC	-0.02685	0.1105	-0.243	0.8081	-0.016512223
EGP_INSTIT_EGP_VALUE_PERC	-0.01338	0.1235	-0.108	0.9137	-0.004443109
EGP_VALUE_NOFIX_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.0219	0.1124	0.195	0.8455	
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	1.14683	1.811	0.633	0.5266	0.010994246
FOR_RETAIL_EGP_VALUE_PERC	0.0642	0.115	0.558	0.5767	0.032366805
DS_TOP_PERC	2.38757	0.5892	4.05	0.0001	0.0704709
VWAP20	0.19614	0.03792	5.17	0.0000	0.114572595
FF_PERC	1.8203	0.3102	5.87	0	0.295804233
Torah Cement					
EGP_VALUE_NOFIX_PERC	-0.11596	0.01202	-9.65	0	-0.188037928
EGP_VALUE_FIX_PERC	0	0			0

FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	-0.37667	0.02282	-16.5	0	
DS_TOP_PERC	0.85076	0.8353	1.02	0.3085	0.012512342
FOR_RETAIL_EGP_VALUE_PERC	0.07842	0.0288	2.72	0.0065	0.0429251
EGP_VALUE_OMNIBUS_PERC	1.9788	0.4093	4.83	0	0.059402092
ORDER20	0.07279	0.00915	7.96	0	0.137629424
EGP_INSTIT_EGP_VALUE_PERC	0.13026	0.02108	6.18	0	0.14283543
FF_PERC	1.11356	0.09646	11.5	0	0.199195262
EGP_VALUE_T0_PERC	1.41186	0.08635	16.3	0	0.2144084
EGP_RETAIL_EGP_VALUE_PERC	0.1632	0.0179	9.12	0	0.226233706
ORDER10	0.11623	0.00913	12.7	0	0.324156221
VWAP20	0.23014	0.009251	24.9	0.0000	0.620398185
Faisal Islamic Bank of Egypt - In EGP					
EGP_VALUE_NOFIX_PERC	-0.16452	0.01732	-9.5	0	-0.216511155
EGP_INSTIT_EGP_VALUE_PERC	-0.1683	0.04203	-4	0.0001	-0.116405044
EGP_RETAIL_EGP_VALUE_PERC	-0.10114	0.03431	-2.95	0.0032	-0.092959299
FOR_RETAIL_EGP_VALUE_PERC	-0.18909	0.05521	-3.43	0.0006	-0.071242076
VWAP20	0	0			0
Constant	-0.20015	0.05478	-3.65	0.0003	
EGP_VALUE_FIX_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
FF_PERC	0.01385	0.004798	2.89	0.0039	0.001090831
EGP_VALUE_OMNIBUS_PERC	0.43197	0.1056	4.09	0	0.068124873
DS_TOP_PERC	4.04829	0.8425	4.81	0.0000	0.077518599
EGP_VALUE_T0_PERC	1.75595	0.2118	8.29	0	0.137967382
ORDER20	0.47683	0.04214	11.3	0	0.828714491
ORDER10	0.35985	0.04208	8.55	0	0.837927271

Table 11.4: Category D Regressions Summary

Company Name	Coefficient	Std.Error	t-value	t-prob	Standardized Coefficients
International Co For Investment & Development					
EGP_VALUE_NOFIX_PERC	-0.00367638	0.0002132	-17.2	0	-0.125144777
FF_PERC	-0.00197675	0.0006924	-2.85	0.0043	-0.023536614
DS_TOP_PERC	-0.01648	0.00608	-2.71	0.0068	-0.015196649
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0
VWAP20	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
Constant	0.0142062	0.002933	4.84	0	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0.0116637	0.002996	3.89	0.0001	0.077814319
EGP_INSTIT_EGP_VALUE_PERC	0.0117722	0.00293	4.02	0.0001	0.103180498
EGP_RETAIL_EGP_VALUE_PERC	0.0116692	0.002864	4.07	0	0.128354494
ORDER20	0.00968138	0.0001568	61.8	0	0.474024786
ORDER10	0.0181836	0.0001743	104	0	1.0818847
The Egyptian Company for Construction Development-Lift Slab					
EGP_VALUE_FIX_PERC	-0.0675787	0.002889	-23.4	0	-0.694305194
EGP_RETAIL_EGP_VALUE_PERC	-0.0550957	0.01584	-3.48	0.0005	-0.119582704
FOR_RETAIL_EGP_VALUE_PERC	-0.048651	0.01978	-2.46	0.014	-0.075158416
EGP_VALUE_T0_PERC	-0.159175	0.04553	-3.5	0.0005	-0.063504368
EGP_INSTIT_EGP_VALUE_PERC	-0.0562118	0.02636	-2.13	0.0331	-0.050475513
DS_TOP_PERC	-0.0980702	0.03909	-2.51	0.0122	-0.044785641
EGP_VALUE_OMNIBUS_PERC	-0.846971	0.4125	-2.05	0.0402	-0.036526463
Constant	0.278829	0.01606	17.4	0	
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
FF_PERC	0.0437998	0.004916	8.91	0	0.31723611
ORDER10	0.0211719	0.001672	12.7	0	0.39564574
Arab Pharmaceuticals					
ORDER20	-0.0189616	0.006482	-2.93	0.0035	-0.046237885
EGP_INSTIT_EGP_VALUE_PERC	-0.0448509	0.01919	-2.34	0.0195	-0.02972492
FOR_INSTIT_EGP_VALUE_PERC	-0.0705042	0.02779	-2.54	0.0112	-0.024526024

EGP_VALUE_T0_PERC	-2.35547	0.8349	-2.82	0.0048	-0.023452038
EGP_RETAIL_EGP_VALUE_PERC	-0.0239653	0.01407	-1.7	0.0886	-0.022944649
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	-0.182434	0.01942	-9.4	0	
DS_TOP_PERC	0.19791	0.1871	1.06	0.2902	0.008830121
EGP_VALUE_OMNIBUS_PERC	0.220152	0.08957	2.46	0.014	0.020696051
EGP_VALUE_NOFIX_PERC	0.0262287	0.005754	4.56	0	0.06537216
ORDER10	0.0572781	0.006017	9.52	0	0.208639989
FF_PERC	0.705165	0.03582	19.7	0	0.226947865

Marsa Alam For Tourism Development

FF_PERC	-0.493223	0.02282	-21.6	0	-0.457438465
EGP_VALUE_FIX_PERC	-0.311324	0.01353	-23	0	-0.425058021
ORDER10	-0.137046	0.01632	-8.4	0	-0.154800928
EGP_INSTIT_EGP_VALUE_PERC	-0.2652	0.1245	-2.13	0.0333	-0.065622606
EGP_RETAIL_EGP_VALUE_PERC	-0.0750285	0.07259	-1.03	0.3015	-0.028480455
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.726245	0.07413	9.8	0	
VWAP20	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.561532	0.5445	1.03	0.3026	0.018190995
EGP_VALUE_OMNIBUS_PERC	0.359679	0.1421	2.53	0.0115	0.063728665
FOR_INSTIT_EGP_VALUE_PERC	0.469123	0.1303	3.6	0.0003	0.076501297
EGP_VALUE_T0_PERC	0.873202	0.08913	9.8	0	0.19398822

Ismailia Misr Poultry

EGP_INSTIT_EGP_VALUE_PERC	-0.595782	0.1249	-4.77	0	-0.321540137
EGP_RETAIL_EGP_VALUE_PERC	-0.377736	0.1207	-3.13	0.0018	-0.275891925
FOR_RETAIL_EGP_VALUE_PERC	-0.367203	0.1264	-2.9	0.0037	-0.17935317
EGP_VALUE_FIX_PERC	-0.0526736	0.01409	-3.74	0.0002	-0.11237667
FF_PERC	-0.185657	0.03848	-4.82	0	-0.105384934
DS_TOP_PERC	-2.13069	0.9439	-2.26	0.0241	-0.035614865
EGP_VALUE_OMNIBUS_PERC	-1.12809	4.516	-0.25	0.8028	-0.003940527
Constant	0.505719	0.1204	4.2	0	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
EGP_VALUE_T0_PERC	0.64353	0.06577	9.79	0	0.162236311
ORDER10	0.0863249	0.009048	9.54	0	0.282325401

Juhayna Food Industries					
ORDER10	-0.071961	0.006972	-10.3	0	-0.234879341
EGP_VALUE_NOFIX_PERC	-0.0690306	0.006239	-11.1	0	-0.230389459
FOR_INSTIT_EGP_VALUE_PERC	-0.0184797	0.009482	-1.95	0.0514	-0.070730024
Constant	0.0496313	0.03243	1.53	0.1261	
VWAP20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.0164004	0.02077	0.79	0.4299	0.01680204
EGP_RETAIL_EGP_VALUE_PERC	0.0079754	0.0103	0.775	0.4387	0.027205966
DS_TOP_PERC	1.68666	0.6156	2.74	0.0062	0.052963445
FOR_RETAIL_EGP_VALUE_PERC	0.0443551	0.01744	2.54	0.0111	0.055071853
FF_PERC	0.302082	0.05423	5.57	0	0.121411766
EGP_VALUE_T0_PERC	0.660716	0.05106	12.9	0	0.257132839
Arab Valves Company					
FF_PERC	-1.11365	0.01378	-80.8	0	-0.849070769
ORDER10	-0.0418678	0.002433	-17.2	0	-0.140441852
EGP_VALUE_FIX_PERC	-0.019369	0.003934	-4.92	0	-0.051189774
FOR_INSTIT_EGP_VALUE_PERC	-0.0818493	0.02072	-3.95	0.0001	-0.043820268
EGP_INSTIT_EGP_VALUE_PERC	-0.052394	0.02043	-2.56	0.0104	-0.029437873
EGP_RETAIL_EGP_VALUE_PERC	-0.0161218	0.01548	-1.04	0.2976	-0.014458108
DS_TOP_PERC	-0.0281123	0.08909	-0.316	0.7524	-0.002488139
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
Constant	0.561146	0.01576	35.6	0	
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	1.45865	0.7475	1.95	0.0512	0.014536228
EGP_VALUE_T0_PERC	0.199076	0.04003	4.97	0	0.037179319
Rowad Tourism (Al Rowad)					
EGP_VALUE_FIX_PERC	-0.0743103	0.008628	-8.61	0	-0.179720149
ORDER10	-0.0251922	0.005785	-4.36	0	-0.097861809
FOR_INSTIT_EGP_VALUE_PERC	-0.161618	0.0595	-2.72	0.0066	-0.051437253
EGP_RETAIL_EGP_VALUE_PERC	-0.0402033	0.03134	-1.28	0.1996	-0.038781703
Constant	0.10578	0.03086	3.43	0.0006	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.0505516	0.1637	0.309	0.7575	0.004890014

EGP_VALUE_T0_PERC	0.147131	0.1127	1.31	0.1919	0.020605227
DS_TOP_PERC	0.930581	0.6875	1.35	0.176	0.021133417
EGP_INSTIT_EGP_VALUE_PERC	0.193163	0.03815	5.06	0	0.142443082
FF_PERC	0.380025	0.01646	23.1	0	0.498837275
Misr Oils & Soap					
ORDER10	-0.168136	0.007185	-23.4	0	-0.631871359
FF_PERC	-0.577646	0.03834	-15.1	0	-0.382734276
EGP_INSTIT_EGP_VALUE_PERC	-0.0982383	0.04504	-2.18	0.0292	-0.108094234
EGP_VALUE_NOFIX_PERC	-0.0131824	0.01058	-1.25	0.2127	-0.030949383
FOR_INSTIT_EGP_VALUE_PERC	-0.263476	0.1483	-1.78	0.0758	-0.029708424
EGP_VALUE_T0_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
Constant	0.291434	0.04278	6.81	0	
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.37027	0.7443	0.497	0.6189	0.007995415
DS_TOP_PERC	0.728091	0.3858	1.89	0.0592	0.030305427
EGP_RETAIL_EGP_VALUE_PERC	0.0359497	0.04145	0.867	0.3859	0.042551867
Lecico Egypt					
EGP_VALUE_NOFIX_PERC	-0.0213815	0.005402	-3.96	0.0001	-0.060251864
FF_PERC	-0.037117	0.007715	-4.81	0	-0.05897745
EGP_VALUE_OMNIBUS_PERC	-0.0907646	0.06254	-1.45	0.1468	-0.016680357
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	-0.158509	0.01174	-13.5	0	
VWAP20	0	0			0
EGP_VALUE_T0_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
DS_TOP_PERC	0.0560866	0.2362	0.237	0.8123	0.002678144
EGP_RETAIL_EGP_VALUE_PERC	0.00519149	0.009776	0.531	0.5954	0.013411086
FOR_INSTIT_EGP_VALUE_PERC	0.0291397	0.01118	2.61	0.0092	0.063003829
FOR_RETAIL_EGP_VALUE_PERC	0.103701	0.01468	7.06	0	0.104553774
ORDER20	0.220014	0.0046	47.8	0	0.829084436
ORDER10	0.23133	0.004586	50.4	0	1.028203815
Misr Hotels					
FOR_INSTIT_EGP_VALUE_PERC	-0.149733	0.02849	-5.26	0	-0.149503154
EGP_RETAIL_EGP_VALUE_PERC	-0.0771291	0.02418	-3.19	0.0014	-0.102581557
EGP_VALUE_FIX_PERC	-0.0320367	0.009861	-3.25	0.0012	-0.074056506
VWAP20	-0.00724856	0.009364	-0.774	0.439	-0.020396222
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0

ORDER20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	-0.14983	0.02643	-5.67	0	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.304973	0.8411	0.363	0.7169	0.005704504
EGP_INSTIT_EGP_VALUE_PERC	0.0104227	0.03357	0.31	0.7562	0.007219771
FF_PERC	0.16157	0.04066	3.97	0.0001	0.076439856
ORDER10	0.147057	0.008559	17.2	0	0.509627152
Golden Coast Company					
EGP_VALUE_NOFIX_PERC	-0.112598	0.0106	-10.6	0	-0.213096985
EGP_RETAIL_EGP_VALUE_PERC	-0.0402547	0.03719	-1.08	0.2792	-0.033880597
FOR_RETAIL_EGP_VALUE_PERC	-0.0211213	0.04523	-0.467	0.6406	-0.014391441
EGP_VALUE_OMNIBUS_PERC	-0.14843	0.2423	-0.613	0.5402	-0.011057287
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.282958	0.03815	7.42	0	
ORDER10	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.352244	0.4507	0.781	0.4347	0.013930019
FOR_INSTIT_EGP_VALUE_PERC	0.129288	0.09702	1.33	0.1829	0.025375139
FF_PERC	0.0852746	0.02041	4.18	0	0.09180348
EGP_VALUE_T0_PERC	0.584628	0.09986	5.85	0	0.105094835
TransOceans Tours					
ORDER10	-0.224788	0.01276	-17.6	0	-0.460352178
FF_PERC	-0.246175	0.03328	-7.4	0	-0.229664048
FOR_INSTIT_EGP_VALUE_PERC	-0.256471	0.1779	-1.44	0.1495	-0.05261026
FOR_RETAIL_EGP_VALUE_PERC	-0.130747	0.1625	-0.805	0.4211	-0.050419229
EGP_RETAIL_EGP_VALUE_PERC	-0.0842024	0.156	-0.54	0.5895	-0.03777954
EGP_VALUE_T0_PERC	-5.27159	2.634	-2	0.0455	-0.034983962
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.265126	0.1566	1.69	0.0905	
ORDER20	0	0			0
VWAP20	0	0			0
DS_TOP_PERC	0.0573444	0.2396	0.239	0.8109	0.004197075
EGP_VALUE_FIX_PERC	0.0555868	0.01683	3.3	0.001	0.072691105
National Bank Of Kuwait- Egypt- NBK					
VWAP20	-0.30644	0.01142	-26.8	0.00000	-1.05898452

EGP_VALUE_T0_PERC	-2.12528	0.3748	-5.67	0	-0.073549718
FOR_INSTIT_EGP_VALUE_PERC	-0.064825	0.02336	-2.78	0.0055	-0.057436521
EGP_INSTIT_EGP_VALUE_PERC	-0.00745427	0.02383	-0.313	0.7545	-0.005887055
Constant	-0.191196	0.01868	-10.2	0	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.422915	1.104	0.383	0.7016	0.004907421
DS_TOP_PERC	0.441118	0.4691	0.94	0.3471	0.012084329
EGP_RETAIL_EGP_VALUE_PERC	0.0175447	0.01762	0.996	0.3194	0.026618291
EGP_VALUE_NOFIX_PERC	0.0217357	0.008638	2.52	0.0119	0.05417024
ORDER10	0.0336581	0.006816	4.94	0	0.113566956
FF_PERC	0.598091	0.01352	44.2	0	1.536174721
Atlas For Investment and Food Industries					
EGP_VALUE_FIX_PERC	-0.145094	0.01401	-10.4	0	-0.366534695
EGP_VALUE_T0_PERC	-1.08892	0.1427	-7.63	0	-0.172716329
ORDER10	-0.0784746	0.01188	-6.6	0	-0.159839596
EGP_VALUE_OMNIBUS_PERC	-0.181209	0.1525	-1.19	0.235	-0.029971529
EGP_RETAIL_EGP_VALUE_PERC	-0.0188378	0.06742	-0.279	0.78	-0.010218211
Constant	0.385911	0.06802	5.67	0	
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
DS_TOP_PERC	0.0344791	0.3418	0.101	0.9197	0.002264442
FF_PERC	0.0179014	0.01712	1.05	0.2959	0.037650777
FOR_INSTIT_EGP_VALUE_PERC	0.408744	0.1632	2.51	0.0123	0.064480838
EGP_INSTIT_EGP_VALUE_PERC	0.222553	0.09452	2.35	0.0187	0.087695868
Delta Insurance					
FF_PERC	-0.209623	0.01437	-14.6	0	-0.306481726
FOR_INSTIT_EGP_VALUE_PERC	-0.109192	0.02203	-4.96	0	-0.136369703
EGP_RETAIL_EGP_VALUE_PERC	-0.00790359	0.01671	-0.473	0.6362	-0.016045154
DS_TOP_PERC	-0.0645341	0.4689	-0.138	0.8906	-0.002297009
EGP_VALUE_FIX_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
Constant	0.0935698	0.02081	4.5	0	
ORDER20	0.00170331	0.005741	0.297	0.7667	0.006409948
EGP_VALUE_OMNIBUS_PERC	0.202364	0.1702	1.19	0.2346	0.019928453
ORDER10	0.0141453	0.005883	2.4	0.0163	0.068876162
FOR_RETAIL_EGP_VALUE_PERC	0.0804973	0.02144	3.75	0.0002	0.098321572
EGP_VALUE_NOFIX_PERC	0.0364747	0.008476	4.3	0	0.112336836

EGP_VALUE_T0_PERC	1.08054	0.08637	12.5	0	0.219952452
Arab Moltaka Investments Co					
DS_TOP_PERC	-0.00998774	0.00488	-2.05	0.0408	-0.037596138
FOR_RETAIL_EGP_VALUE_PERC	-0.0187722	0.01773	-1.06	0.2898	-0.032102976
EGP_VALUE_OMNIBUS_PERC	-0.00399066	0.04441	-0.0899	0.9284	-0.001687521
ORDER20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	-0.047875	0.01598	-3	0.0028	
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
	0.00028250				
EGP_VALUE_NOFIX_PERC	1	0.003763	0.0751	0.9402	0.001507267
EGP_VALUE_T0_PERC	0.0173253	0.01529	1.13	0.2574	0.020979579
EGP_RETAIL_EGP_VALUE_PERC	0.0214561	0.01461	1.47	0.1421	0.050459539
FOR_INSTIT_EGP_VALUE_PERC	0.111928	0.02685	4.17	0	0.093938243
ORDER10	0.0268318	0.003047	8.81	0	0.181576644
FF_PERC	1.15122	0.04365	26.4	0	0.509324003

Table 11.5: Category E Regressions Summary

Company Name	Coefficient	Std.Error	t-value	t-prob	Standardized Coefficients
Alexandria National Company for Financial Investment					
FF_PERC	-1.61703	0.06657	-24.3	0	-0.576070242
EGP_VALUE_FIX_PERC	-0.0941499	0.01046	-9	0	-0.185395142
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.220914	0.05652	3.91	0.0001	
EGP_VALUE_T0_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
ORDER20	0	0			0
VWAP20	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	6.60591	2.317	2.85	0.0044	0.052168865
EGP_RETAIL_EGP_VALUE_PERC	0.205926	0.05808	3.55	0.0004	0.088304454
DS_TOP_PERC	1.27043	0.2282	5.57	0.00000	0.106765403
FOR_RETAIL_EGP_VALUE_PERC	0.419705	0.08561	4.9	0	0.117888045
ORDER10	0.112328	0.006271	17.9	0	0.375267495
Egyptian Arabian (cmar) Securities Brokerage EAC					
FOR_RETAIL_EGP_VALUE_PERC	-0.27219	0.0321	-8.48	0	-0.228967673
EGP_RETAIL_EGP_VALUE_PERC	-0.20838	0.02766	-7.53	0	-0.219510524
EGP_INSTIT_EGP_VALUE_PERC	-0.187575	0.05364	-3.5	0.0005	-0.057616902
FF_PERC	-0.0543986	0.01753	-3.1	0.0019	-0.052420658
EGP_VALUE_T0_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.262172	0.02864	9.16	0	0
EGP_VALUE_FIX_PERC	0	0			0
ORDER10	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.561585	0.288	1.95	0.0513	0.027274505
DS_TOP_PERC	0.683041	0.1434	4.76	0.00000	0.068348135
EGP_VALUE_NOFIX_PERC	0.155063	0.006348	24.4	0	0.379292941
Mohandes Insurance					
EGP_RETAIL_EGP_VALUE_PERC	-0.0992347	0.03742	-2.65	0.0081	-0.140120942
FOR_RETAIL_EGP_VALUE_PERC	-0.0658632	0.03977	-1.66	0.0978	-0.073415276
EGP_INSTIT_EGP_VALUE_PERC	-0.0765417	0.04257	-1.8	0.0723	-0.060901742
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0

EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.167103	0.03974	-4.2	0	
ORDER10	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
DS_TOP_PERC	0.599827	0.2622	2.29	0.02220	0.037514713
EGP_VALUE_NOFIX_PERC	0.0259187	0.01037	2.5	0.0125	0.062649334
FF_PERC	0.321621	0.01947	16.5	0	0.41903427
ORDER20	0.165584	0.008672	19.1	0	0.44790028

Orascom Investment Holding

FOR_INSTIT_EGP_VALUE_PERC	-0.149259	0.01433	-10.4	0	-0.285630411
EGP_RETAIL_EGP_VALUE_PERC	-0.0923801	0.01179	-7.84	0	-0.273480125
FF_PERC	-0.240436	0.02554	-9.41	0	-0.190833296
EGP_INSTIT_EGP_VALUE_PERC	-0.0541308	0.01439	-3.76	0.0002	-0.108820162
EGP_VALUE_OMNIBUS_PERC	-0.0585673	0.02956	-1.98	0.0477	-0.039003403
DS_TOP_PERC	-0.0914081	0.09358	-0.977	0.32880	-0.017932025
EGP_VALUE_FIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.342786	0.01447	23.7	0	
VWAP20	0	0			0
ORDER10	0	0			0
ORDER20	0	0			0
EGP_VALUE_NOFIX_PERC	0.00662635	0.005673	1.17	0.243	0.025390464
EGP_VALUE_T0_PERC	0.28538	0.01282	22.3	0	0.457891159

Reacap Financial Investments

FF_PERC	-0.394413	0.006945	-56.8	0	-0.739030199
ORDER10	-0.0515592	0.001828	-28.2	0	-0.338558169
EGP_RETAIL_EGP_VALUE_PERC	-0.0151035	0.005291	-2.85	0.0044	-0.071119698
EGP_INSTIT_EGP_VALUE_PERC	-0.0114135	0.007149	-1.6	0.1106	-0.0238298
EGP_VALUE_OMNIBUS_PERC	-0.0225359	0.01279	-1.76	0.0783	-0.019111056
FOR_RETAIL_EGP_VALUE_PERC	-0.00383408	0.005954	-0.644	0.5197	-0.014904463
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.273381	0.005053	54.1	0	
DS_TOP_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
EGP_VALUE_FIX_PERC	0.0056125	0.001829	3.07	0.0022	0.033073832
EGP_VALUE_T0_PERC	0.0997558	0.008436	11.8	0	0.12919885

Misr National Steel - Ataqa

FF_PERC	-4.36345	0.1664	-26.2	0	-0.607636674

EGP_VALUE_NOFIX_PERC	-0.113468	0.01709	-6.64	0	-0.157768373
EGP_RETAIL_EGP_VALUE_PERC	-0.16416	0.04818	-3.41	0.0007	-0.143005057
EGP_INSTIT_EGP_VALUE_PERC	-0.108719	0.05503	-1.98	0.0485	-0.082392148
DS_TOP_PERC	-2.47662	1.175	-2.11	0.03520	-0.045674171
EGP_VALUE_OMNIBUS_PERC	-0.178042	0.138	-1.29	0.1973	-0.02891355
FOR_RETAIL_EGP_VALUE_PERC	-0.0821857	0.112	-0.734	0.4632	-0.017819968
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
ORDER10	0	0			0
Constant	0.625188	0.04756	13.1	0	
ORDER20	0	0			0
EGP_VALUE_T0_PERC	0.784386	0.09091	8.63	0	0.192068173

Minapharm Pharmaceuticals

EGP_VALUE_NOFIX_PERC	-0.00136117	0.00006927	-19.7	0	-0.430411275
FF_PERC	-0.00113772	0.0001576	-7.22	0	-0.144403738
DS_TOP_PERC	-0.013992	0.003656	-3.83	0.00010	-0.07645019
EGP_VALUE_OMNIBUS_PERC	0	0			0
Constant	0.0326128	0.0003152	103	0	
VWAP20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
ORDER10	0	0			0
EGP_VALUE_T0_PERC	0.00041026	0.0008485	0.484	0.6288	0.009500219
EGP_RETAIL_EGP_VALUE_PERC	0.00042685	0.0003095	1.38	0.1681	0.072729526
FOR_INSTIT_EGP_VALUE_PERC	0.00144771	0.0003692	3.92	0.0001	0.143787376
FOR_RETAIL_EGP_VALUE_PERC	0.00195649	0.0003422	5.72	0	0.246632949

Emaar Misr for Development

EGP_VALUE_FIX_PERC	-0.075011	0.004848	-15.5	0	-0.41223087
EGP_INSTIT_EGP_VALUE_PERC	-0.0106242	0.009831	-1.08	0.2801	-0.05292208
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.0363378	0.01529	2.38	0.0177	
ORDER20	0	0			0
VWAP20	0	0			0
ORDER10	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0.11678	0.1004	1.16	0.24530	0.028779983
EGP_VALUE_T0_PERC	0.00825037	0.007228	1.14	0.254	0.031198169
EGP_VALUE_OMNIBUS_PERC	0.0664715	0.01243	5.35	0	0.156214932
FOR_INSTIT_EGP_VALUE_PERC	0.0598566	0.00976	6.13	0	0.281184787
FF_PERC	1.29633	0.1167	11.1	0	0.289579124

EGP_RETAIL_EGP_VALUE_PERC	0.0660557	0.008345	7.92	0	0.430066714

El-Nile Co. For Pharmaceuticals And Chemical Industries

FOR_INSTIT_EGP_VALUE_PERC	-0.278594	0.03495	-7.97	0	-0.14612575
FF_PERC	-0.639019	0.08903	-7.18	0	-0.111446064
EGP_INSTIT_EGP_VALUE_PERC	-0.0897177	0.02874	-3.12	0.0018	-0.079339225
EGP_RETAIL_EGP_VALUE_PERC	-0.0470997	0.02477	-1.9	0.0574	-0.052593066
EGP_VALUE_FIX_PERC	-0.00666552	0.009704	-0.687	0.4922	-0.01444486
VWAP20	-0.100051	0.1116	-0.897	0.37	-0.011872246
EGP_VALUE_OMNIBUS_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
ORDER20	0	0			0
Constant	0.183711	0.03367	5.46	0	
DS_TOP_PERC	0.681388	0.6012	1.13	0.25720	0.014993727
EGP_VALUE_T0_PERC	1.48277	0.2148	6.9	0	0.091575861
ORDER10	0.0860243	0.007235	11.9	0	0.264457561

General Company For Land Reclamation,Development & Reconstru

ORDER10	-0.244606	0.01813	-13.5	0	-0.270278432
FF_PERC	-0.434876	0.09553	-4.55	0	-0.096189754
EGP_RETAIL_EGP_VALUE_PERC	-0.320302	0.1115	-2.87	0.0041	-0.086761274
EGP_INSTIT_EGP_VALUE_PERC	-0.386905	0.1443	-2.68	0.0074	-0.07970243
Constant	0.629114	0.1125	5.59	0	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.0232729	0.78	0.0298	0.9762	0.000564432
FOR_INSTIT_EGP_VALUE_PERC	0.43954	0.4188	1.05	0.2941	0.020396874
DS_TOP_PERC	0.447827	0.3069	1.46	0.14470	0.028070206
EGP_VALUE_T0_PERC	1.20738	0.1404	8.6	0	0.163516637
EGP_VALUE_NOFIX_PERC	0.248485	0.01209	20.6	0	0.421782585

Ismailia National Food Industries

EGP_INSTIT_EGP_VALUE_PERC	-0.78847	0.08208	-9.61	0	-0.328720741
ORDER10	-0.115477	0.01421	-8.13	0	-0.182059964
EGP_RETAIL_EGP_VALUE_PERC	-0.305177	0.0654	-4.67	0	-0.169647698
FOR_INSTIT_EGP_VALUE_PERC	-0.343562	0.1197	-2.87	0.0041	-0.071985436
EGP_VALUE_OMNIBUS_PERC	-0.324764	0.3051	-1.06	0.2872	-0.022959947
FF_PERC	-0.0354315	0.06199	-0.572	0.5677	-0.012108916
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	0.547105	0.06968	7.85	0	
EGP_VALUE_FIX_PERC	0	0			0

VWAP20	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.675044	1.102	0.612	0.54030	0.01280496
EGP_VALUE_T0_PERC	0.311423	0.2086	1.49	0.1357	0.031196339
EGP_VALUE_NOFIX_PERC	0.10127	0.0136	7.45	0	0.168897406

Zahraa Maadi Investment & Development

ORDER10	-0.104574	0.01207	-8.67	0	-0.261494577
EGP_VALUE_T0_PERC	-0.41502	0.2826	-1.47	0.1421	-0.028749987
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	-0.0773307	0.0708	-1.09	0.2748	
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	4.2915	5.864	0.732	0.4643	0.014197148
EGP_RETAIL_EGP_VALUE_PERC	0.0591376	0.06979	0.847	0.3969	0.038621981
EGP_INSTIT_EGP_VALUE_PERC	0.104665	0.08084	1.29	0.1955	0.049540739
DS_TOP_PERC	1.84795	0.6663	2.77	0.00560	0.053798793
FOR_RETAIL_EGP_VALUE_PERC	0.152219	0.08689	1.75	0.0799	0.056239787
EGP_VALUE_NOFIX_PERC	0.0770074	0.01571	4.9	0	0.12763163
FF_PERC	0.414887	0.06636	6.25	0	0.157593125

Porto Group

EGP_INSTIT_EGP_VALUE_PERC	-0.375867	0.07538	-4.99	0	-0.188771105
EGP_VALUE_FIX_PERC	-0.225496	0.03079	-7.32	0	-0.178676589
EGP_RETAIL_EGP_VALUE_PERC	-0.0531121	0.06042	-0.879	0.3796	-0.044154631
FOR_RETAIL_EGP_VALUE_PERC	-0.0271124	0.06993	-0.388	0.6983	-0.016036483
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
Constant	-0.245147	0.06253	-3.92	0.0001	
ORDER10	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.119748	0.23	0.521	0.6028	0.011781572
DS_TOP_PERC	0.430994	0.2241	1.92	0.05480	0.042279267
EGP_VALUE_T0_PERC	0.926056	0.0826	11.2	0	0.25272337
FF_PERC	1.02684	0.03621	28.4	0	0.680305896

Suez Bags

EGP_RETAIL_EGP_VALUE_PERC	-0.0147932	0.05014	-0.295	0.768	-0.022430059
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0
Constant	-0.0656392	0.05099	-1.29	0.1982	
EGP_VALUE_FIX_PERC	0	0			0

FOR_RETAIL_EGP_VALUE_PERC	0	0			0
DS_TOP_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0.00345935	0.05575	0.0621	0.9505	0.003903768
VWAP20	0.0628586	0.03868	1.63	0.1044	0.03737904
EGP_INSTIT_EGP_VALUE_PERC	0.0560224	0.05624	0.996	0.3194	0.050326138
EGP_VALUE_NOFIX_PERC	0.0183795	0.008479	2.17	0.0304	0.063217698
FF_PERC	0.149688	0.05219	2.87	0.0042	0.06582752
ORDER20	0.150008	0.007214	20.8	0	0.636642607
ORDER10	0.135129	0.007459	18.1	0	0.654830257

Saudi Egyptian Investment & Finance

EGP_VALUE_FIX_PERC	-0.0332548	0.007213	-4.61	0	-0.114531748
EGP_RETAIL_EGP_VALUE_PERC	-0.0720761	0.04808	-1.5	0.134	-0.057161767
FOR_INSTIT_EGP_VALUE_PERC	-0.186898	0.09523	-1.96	0.0498	-0.043875902
EGP_INSTIT_EGP_VALUE_PERC	-0.0196767	0.05646	-0.349	0.7275	-0.012774859
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
Constant	-0.00204726	0.04847	-0.0422	0.9663	
ORDER20	0	0			0
DS_TOP_PERC	0.219843	0.3825	0.575	0.56550	0.011141648
EGP_VALUE_T0_PERC	0.884445	0.377	2.35	0.0191	0.045472694
ORDER10	0.0359968	0.005322	6.76	0	0.189745283
FF_PERC	0.280882	0.02698	10.4	0	0.238116485

Grand Investment Capital

ORDER10	-0.205967	0.006017	-34.2	0	-0.634713128
FOR_RETAIL_EGP_VALUE_PERC	-0.105443	0.096	-1.1	0.2722	-0.040426015
FOR_INSTIT_EGP_VALUE_PERC	-0.0904112	0.1042	-0.867	0.3859	-0.026356167
EGP_RETAIL_EGP_VALUE_PERC	-0.0257883	0.08401	-0.307	0.7589	-0.013477027
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.00711918	0.08531	0.0835	0.9335	
VWAP20	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_NOFIX_PERC	0.00830044	0.007575	1.1	0.2734	0.020573052
DS_TOP_PERC	1.5802	0.3339	4.73	0.00000	0.084640282
FF_PERC	0.310167	0.01992	15.6	0	0.283549297

Egyptian Satellites (NileSat)

ORDER20	-0.136151	0.1887	-0.721	0.4708	-0.242454217

ORDER10	-0.0839394	0.1888	-0.445	0.6567	-0.214531156
FOR_INSTIT_EGP_VALUE_PERC	-0.153564	0.03813	-4.03	0.0001	-0.13385007
EGP_RETAIL_EGP_VALUE_PERC	-0.0519546	0.03237	-1.61	0.1086	-0.052863334
FF_PERC	-0.0486681	0.02762	-1.76	0.0781	-0.040950577
DS_TOP_PERC	-0.292054	1.061	-0.275	0.78320	-0.004567971
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
EGP_VALUE_T0_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.049447	0.192	0.258	0.7967	
VWAP20	0	0			0
EGP_VALUE_NOFIX_PERC	0.0139943	0.01491	0.938	0.3481	0.024880246
FOR_RETAIL_EGP_VALUE_PERC	0.171537	0.1109	1.55	0.1221	0.026641637

Alexandria Pharmaceuticals

EGP_RETAIL_EGP_VALUE_PERC	-0.0129262	0.01773	-0.729	0.466	-0.02107056
EGP_VALUE_T0_PERC	-0.2431	0.2632	-0.924	0.3558	-0.012778938
EGP_VALUE_NOFIX_PERC	-8.12762E-05	0.008735	-0.0093	0.9926	-0.000208774
EGP_VALUE_FIX_PERC	0	0			0
Constant	-0.351561	0.02249	-15.6	0	
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0.000343525	0.02184	0.0157	0.9875	0.000340226
EGP_INSTIT_EGP_VALUE_PERC	0.00698989	0.02129	0.328	0.7427	0.008009478
DS_TOP_PERC	1.20251	0.8527	1.41	0.15860	0.019501657
EGP_VALUE_OMNIBUS_PERC	0.399568	0.1493	2.68	0.0075	0.037190107
FF_PERC	0.706656	0.04303	16.4	0	0.296849156
ORDER10	0.11825	0.007266	16.3	0	0.422684159
ORDER20	0.170065	0.006492	26.2	0	0.436911704

El Arabia Engineering Industries

EGP_INSTIT_EGP_VALUE_PERC	-5.72616E-15	1.49E-15	-3.84	0.0001	-0.103083615
FOR_INSTIT_EGP_VALUE_PERC	-2.24342E-15	1.209E-15	-1.86	0.0638	-0.06069001
EGP_VALUE_T0_PERC	-2.84657E-16	4.109E-15	-0.0693	0.9448	-0.001427654
EGP_VALUE_OMNIBUS_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
Constant	0.0749542	0	0	1	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
ORDER10	0	0			0
EGP_RETAIL_EGP_VALUE_PERC	5.23988E-17	9.366E-16	0.0559	0.9554	0.002057313
EGP_VALUE_NOFIX_PERC	5.14373E-17	2.079E-16	0.247	0.8046	0.006025607
DS_TOP_PERC	7.34901E-16	5.851E-16	1.26	0.20930	0.026561823

FF_PERC	7.49305E-16	6.734E-16	1.11	0.266	0.030757391

Memphis Pharmaceuticals

EGP_VALUE_FIX_PERC	-0.0390378	0.008951	-4.36	0	-0.092193651
FF_PERC	-0.404895	0.07332	-5.52	0	-0.081368119
FOR_RETAIL_EGP_VALUE_PERC	-0.0581481	0.1047	-0.556	0.5786	-0.035588769
EGP_RETAIL_EGP_VALUE_PERC	-0.0323169	0.1023	-0.316	0.7521	-0.033271811
EGP_VALUE_T0_PERC	-2.49802	1.437	-1.74	0.0822	-0.02319504
EGP_INSTIT_EGP_VALUE_PERC	-0.000775932	0.1037	-0.00748	0.994	-0.000600731
EGP_VALUE_OMNIBUS_PERC	0	0			0
Constant	-0.0259613	0.1139	-0.228	0.8198	
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0.00753355	0.1111	0.0678	0.946	0.002287043
DS_TOP_PERC	0.172586	0.3063	0.563	0.57320	0.007497874
ORDER20	0.206995	0.04618	4.48	0	0.515088181
ORDER10	0.215722	0.04615	4.67	0	0.733431758

El Obour Real Estate Investment

FF_PERC	-5.69613E-17	3.303E-16	-0.172	0.8631	-0.00576842
EGP_INSTIT_EGP_VALUE_PERC	-4.4286E-17	1.716E-15	-0.0258	0.9794	-0.001192764
FOR_RETAIL_EGP_VALUE_PERC	-2.53792E-17	1.562E-15	-0.0163	0.987	-0.001128234
EGP_VALUE_T0_PERC	-8.41571E-17	2.368E-15	-0.0355	0.9716	-0.000849706
EGP_RETAIL_EGP_VALUE_PERC	-6.79932E-18	1.462E-15	-0.00465	0.9963	-0.000386253
EGP_VALUE_OMNIBUS_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
Constant	0.0396462	0	0	1	
VWAP20	0	0			0
ORDER20	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
DS_TOP_PERC	1.15413E-17	2.517E-14	0.000459	0.99960	1.0971E-05
EGP_VALUE_NOFIX_PERC	7.2474E-18	1.312E-16	0.0553	0.9559	0.001510832
ORDER10	5.50348E-16	8.883E-16	0.62	0.5357	0.214597749

Table 11.6: Category F Regressions Summary

Company Name	Coefficient	Std.Error	t-value	t-prob	Standardized Coefficients
Cleopatra Hospital Company					
EGP_RETAIL_EGP_VALUE_PERC	-0.229768	0.07977	-2.88	0.0041	-0.416712994
FOR_INSTIT_EGP_VALUE_PERC	-0.213122	0.08194	-2.6	0.0095	-0.365853198
EGP_VALUE_OMNIBUS_PERC	-0.33831	0.06938	-4.88	0	-0.246319669
FF_PERC	-0.78685	0.1409	-5.58	0	-0.238185368
EGP_VALUE_TO_PERC	-0.507984	0.1763	-2.88	0.0041	-0.112372457
EGP_VALUE_NOFIX_PERC	-0.085268	0.02987	-2.86	0.0044	-0.106886993
EGP_INSTIT_EGP_VALUE_PERC	-0.108886	0.0951	-1.15	0.2526	-0.10684755
EGP_VALUE_FIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
ORDER10	0	0			0
Constant	0.544164	0.08914	6.1	0	
ORDER20	0	0			0
DS_TOP_PERC	1.6268	0.8842	1.84	0.0662	0.065357391
Orascom Construction PLC					
FF_PERC	-0.911887	0.03463	-26.3	0	-0.619435122
EGP_VALUE_FIX_PERC	-0.0558647	0.00853	-6.55	0	-0.150518332
EGP_VALUE_TO_PERC	-0.114341	0.02956	-3.87	0.0001	-0.095358553
FOR_RETAIL_EGP_VALUE_PERC	-0.0814396	0.02175	-3.74	0.0002	-0.088464788
FOR_INSTIT_EGP_VALUE_PERC	-0.0273323	0.01051	-2.6	0.0095	-0.087962536
Constant	0.301151	0.00982	30.7	0	
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
ORDER10	0	0			0
DS_TOP_PERC	0.259843	0.4289	0.606	0.5447	0.013413891
EGP_VALUE_OMNIBUS_PERC	0.0779945	0.01742	4.48	0	0.104737325
EGP_RETAIL_EGP_VALUE_PERC	0.0434919	0.01072	4.06	0.0001	0.143179986
Misr Fretilizers Production Company - Mopco					
EGP_INSTIT_EGP_VALUE_PERC	-0.157483	0.08589	-1.83	0.0672	-0.202698013
FOR_INSTIT_EGP_VALUE_PERC	-0.305611	0.09573	-3.19	0.0015	-0.188315983
EGP_VALUE_TO_PERC	-0.41017	0.1102	-3.72	0.0002	-0.136385695
DS_TOP_PERC	-0.0717758	0.03611	-1.99	0.0472	-0.071821293

EGP_VALUE_FIX_PERC	-0.0573444	0.03213	-1.78	0.0748	-0.066852377
EGP_VALUE_OMNIBUS_PERC	-0.0863958	0.06226	-1.39	0.1657	-0.064564917
FF_PERC	-0.274005	0.4201	-0.652	0.5144	-0.024183432
EGP_RETAIL_EGP_VALUE_PERC	0.000247751	0.0802	-0.00309	0.9975	-0.000366028
EGP_VALUE_NOFIX_PERC	0	0			0
ORDER10	0	0			0
Constant	0.313465	0.1178	2.66	0.008	
ORDER20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
Sabaa International Company for Pharmaceutical and Chemical					
FF_PERC	-0.19868	0.03181	-6.25	0	-0.203342098
EGP_RETAIL_EGP_VALUE_PERC	-0.226574	0.2164	-1.05	0.2954	-0.108489518
FOR_RETAIL_EGP_VALUE_PERC	-0.198695	0.2327	-0.854	0.3934	-0.065188454
EGP_VALUE_T0_PERC	-0.919273	0.492	-1.87	0.062	-0.05405466
EGP_INSTIT_EGP_VALUE_PERC	-0.145387	0.2379	-0.611	0.5412	-0.048651186
EGP_VALUE_OMNIBUS_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.304145	0.2188	1.39	0.1649	
ORDER20	0	0			0
VWAP20	0	0			0
EGP_VALUE_FIX_PERC	0.0151739	0.01972	0.77	0.4418	0.023246933
ORDER10	0.0496634	0.0237	2.1	0.0363	0.073338722
DS_TOP_PERC	3.39492	1.025	3.31	0.001	0.095878369
Arabian Cement Company					
FOR_INSTIT_EGP_VALUE_PERC	-0.118522	0.03581	-3.31	0.001	-0.204364123
EGP_INSTIT_EGP_VALUE_PERC	-0.113205	0.03593	-3.15	0.0017	-0.18298756
EGP_VALUE_NOFIX_PERC	-0.0552862	0.01434	-3.85	0.0001	-0.092327906
FF_PERC	-0.0254013	0.1629	-0.156	0.8761	-0.003560284
Constant	0.233606	0.05117	4.57	0	
EGP_VALUE_FIX_PERC	0	0			0
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
ORDER10	0	0			0
EGP_RETAIL_EGP_VALUE_PERC	0.00247789	0.03558	0.0697	0.9445	0.005760552
DS_TOP_PERC	1.03557	0.7162	1.45	0.1484	0.029420202
EGP_VALUE_OMNIBUS_PERC	0.157486	0.03464	4.55	0	0.097140617
EGP_VALUE_T0_PERC	0.906222	0.04151	21.8	0	0.50446975

El Wadi For International and Investement Development					
FOR_INSTIT_EGP_VALUE_PERC	-0.510089	0.1231	-4.15	0	-0.138116843
FF_PERC	-0.0585636	0.02594	-2.26	0.0241	-0.077244238
DS_TOP_PERC	-1.57854	0.7282	-2.17	0.0303	-0.052518064
EGP_VALUE_OMNIBUS_PERC	-0.108117	0.09285	-1.16	0.2444	-0.040851488
EGP_VALUE_T0_PERC	-0.0438792	0.03672	-1.19	0.2323	-0.03149871
EGP_INSTIT_EGP_VALUE_PERC	-0.0299503	0.1019	-0.294	0.7689	-0.014975953
EGP_RETAIL_EGP_VALUE_PERC	-0.00949162	0.07594	-0.125	0.9005	-0.007253777
Constant	0.31092	0.07632	4.07	0	
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
ORDER10	0	0			0
EGP_VALUE_FIX_PERC	0.0594976	0.01832	3.25	0.0012	0.105686913
FOR_RETAIL_EGP_VALUE_PERC	0.380449	0.08923	4.26	0	0.196223394
CI Capital Holding For Financial Investments					
FF_PERC	-0.436554	0.0418	-10.4	0	-0.544082126
EGP_RETAIL_EGP_VALUE_PERC	-0.198314	0.05812	-3.41	0.0007	-0.499119116
FOR_INSTIT_EGP_VALUE_PERC	-0.201454	0.0561	-3.59	0.0004	-0.478562927
EGP_INSTIT_EGP_VALUE_PERC	-0.247685	0.06291	-3.94	0.0001	-0.420727334
EGP_VALUE_T0_PERC	-0.00954067	0.1803	-0.0529	0.9578	-0.002552566
Constant	0.360276	0.06072	5.93	0	
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
ORDER10	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0.323259	0.5667	0.57	0.5689	0.027432993
EGP_VALUE_FIX_PERC	0.0149619	0.02705	0.553	0.5807	0.028823261
EGP_VALUE_OMNIBUS_PERC	0.120419	0.07384	1.63	0.1041	0.083775785
Obour Land For Food Industries					
FOR_INSTIT_EGP_VALUE_PERC	-0.0023457	0.002007	-1.17	0.2432	-0.228580442
EGP_VALUE_FIX_PERC	-0.000563291	0.0004783	-1.18	0.2395	-0.049223304
EGP_INSTIT_EGP_VALUE_PERC	-0.000440941	0.002025	-0.218	0.8277	-0.035432663
Constant	0.0557705	0.002487	22.4	0	
FOR_RETAIL_EGP_VALUE_PERC	0	0			0
VWAP20	0	0			0
ORDER10	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0

ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.00097221	0.001055	0.921	0.3574	0.042486628
DS_TOP_PERC	3.0058	1.585	1.9	0.0584	0.082055401
EGP_RETAIL_EGP_VALUE_PERC	0.001146	0.002023	0.567	0.5713	0.107399422
FF_PERC	0.0089807	0.002934	3.06	0.0023	0.133097249
EGP_VALUE_TO_PERC	0.0274955	0.006505	4.23	0	0.179182316
Ibnsina Pharma					
EGP_INSTIT_EGP_VALUE_PERC	-0.000210892	0.0001107	-1.91	0.0576	-0.064248794
EGP_VALUE_OMNIBUS_PERC	-0.000258778	0.0001645	-1.57	0.1166	-0.046726595
EGP_VALUE_TO_PERC	-0.000319604	0.0003677	-0.869	0.3853	-0.024592569
FOR_INSTIT_EGP_VALUE_PERC	-1.89978E-05	0.00008807	-0.216	0.8293	-0.007104381
VWAP20	0	0			0
EGP_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
ORDER20	0	0			0
ORDER10	0	0			0
Constant	0.130144	0.0004911	265	0	
FOR_RETAIL_EGP_VALUE_PERC	4.98942E-05	0.0002094	0.238	0.8118	0.00679374
DS_TOP_PERC	0.00136411	0.001733	0.787	0.4317	0.020976883
EGP_VALUE_FIX_PERC	0.000247208	0.0001038	2.38	0.0178	0.072641116
FF_PERC	0.0364539	0.001282	28.4	0	0.820034234
Arabian Food Industries DOMTY					
FF_PERC	-0.810525	0.03457	-23.4	0	-0.608642591
DS_TOP_PERC	-0.429991	0.3005	-1.43	0.1529	-0.032755621
FOR_RETAIL_EGP_VALUE_PERC	-0.00254921	0.02139	-0.119	0.9052	-0.002985382
Constant	0.381147	0.01811	21	0	
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
VWAP20	0	0			0
ORDER10	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0.00106817	0.009836	0.109	0.9136	0.002526417
FOR_INSTIT_EGP_VALUE_PERC	0.00222052	0.01316	0.169	0.8661	0.006572068
EGP_VALUE_OMNIBUS_PERC	0.0195812	0.02143	0.914	0.3612	0.024110083
EGP_RETAIL_EGP_VALUE_PERC	0.0164691	0.01236	1.33	0.1831	0.054501258
EGP_VALUE_TO_PERC	0.386415	0.03704	10.4	0	0.278349121
Golden Textiles & Clothes Wool					
EGP_VALUE_OMNIBUS_PERC	0	0			0

EGP_VALUE_T0_PERC	0	0			0
DS_TOP_PERC	3.22382E-15	1.343E-13	0.024	0.9809	0
FF_PERC	-3.26659E-15	6.62E-15	-0.493	0.6218	0
EGP_RETAIL_EGP_VALUE_PERC	-8.68707E-16	1.146E-14	-0.0758	0.9396	0
FOR_INSTIT_EGP_VALUE_PERC	-9.1159E-16	2.223E-14	-0.041	0.9673	0
EGP_VALUE_NOFIX_PERC	0	0			0
FOR_RETAIL_EGP_VALUE_PERC	-8.34572E-16	1.289E-14	-0.0648	0.9484	0
EGP_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER10	2.33337E-16	1.377E-15	0.169	0.8655	0
Constant	-0.497167	0	0	1	
ORDER20	0	0			0
EGP_VALUE_FIX_PERC	6.07078E-16	1.738E-15	0.349	0.7269	0
VWAP20	0	0			0

Table 11.7: Category G Regressions Summary

Company Name	Coefficient	Std.Error	t-value	t-prob	Standardized Coefficients
Egyptians For Investment & Urban Development					
EGP_RETAIL_EGP_VALUE_PERC	-0.98473	0.1364	-7.22	0	-0.417961382
ORDER10	-0.333355	0.01913	-17.4	0	-0.342945111
FOR_RETAIL_EGP_VALUE_PERC	-0.82893	0.1459	-5.68	0	-0.313419538
FF_PERC	-0.141783	0.01252	-11.3	0	-0.238475907
EGP_VALUE_FIX_PERC	-0.103787	0.0125	-8.3	0	-0.176942499
EGP_INSTIT_EGP_VALUE_PERC	-1.492	0.2204	-6.77	0	-0.163865958
EGP_VALUE_T0_PERC	-0.181746	0.07832	-2.32	0.0204	-0.045712926
Constant	1.74662	0.1369	12.8	0	
EGP_VALUE_NOFIX_PERC	0	0			0
VWAP20	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.931787	7.95	0.117	0.9067	0.002238957
DS_TOP_PERC	1.16684	3.366	0.347	0.7289	0.006623969
Ismailia Development and Real Estate Co					
EGP_VALUE_FIX_PERC	-0.248979	0.0132	-18.9	0	-0.428471077
FOR_RETAIL_EGP_VALUE_PERC	-0.132327	0.1477	-0.896	0.3703	-0.040010123
DS_TOP_PERC	-0.824292	1.122	-0.734	0.4628	-0.015571626
EGP_INSTIT_EGP_VALUE_PERC	-0.0520816	0.1733	-0.301	0.7638	-0.009717605
EGP_VALUE_OMNIBUS_PERC	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
Constant	0.236159	0.1314	1.8	0.0725	
ORDER10	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
EGP_RETAIL_EGP_VALUE_PERC	0.015314	0.1311	0.117	0.907	0.005997303
FF_PERC	0.474725	0.1014	4.68	0	0.106461291
EGP_VALUE_T0_PERC	0.380431	0.07315	5.2	0	0.110329111
Edita Food Industries S.A.E					
FF_PERC	-0.392569	0.05006	-7.84	0	-0.276930331
EGP_VALUE_OMNIBUS_PERC	-0.125178	0.03944	-3.17	0.0016	-0.126235777
VWAP20	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0	0			0
Constant	0.0115388	0.06703	0.172	0.8634	

FOR_RETAIL_EGP_VALUE_PERC	0	0			0
EGP_VALUE_NOFIX_PERC	0	0			0
ORDER10	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0.0019997	0.07205	0.0278	0.9779	0.003270229
EGP_VALUE_T0_PERC	0.108551	0.1912	0.568	0.5704	0.018374485
FOR_INSTIT_EGP_VALUE_PERC	0.0405914	0.06865	0.591	0.5545	0.105781009
EGP_VALUE_FIX_PERC	0.0530835	0.01521	3.49	0.0005	0.115028575
EGP_RETAIL_EGP_VALUE_PERC	0.0573239	0.06886	0.832	0.4054	0.14839749
Dice Sport & Casual Wear					
EGP_VALUE_NOFIX_PERC	-0.255925	0.04484	-5.71	0	-0.328932475
FF_PERC	-0.20505	0.07502	-2.73	0.0066	-0.159152765
Constant	0.0856797	0.07092	1.21	0.2279	
EGP_VALUE_FIX_PERC	0	0			0
ORDER20	0	0			0
DS_TOP_PERC	0	0			0
VWAP20	0	0			0
ORDER10	0	0			0
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_INSTIT_EGP_VALUE_PERC	0.00912455	0.06528	0.14	0.8889	0.009854326
EGP_VALUE_T0_PERC	0.797331	0.2796	2.85	0.0046	0.140792142
EGP_VALUE_OMNIBUS_PERC	0.373306	0.1396	2.67	0.0079	0.141820279
FOR_RETAIL_EGP_VALUE_PERC	0.47954	0.1031	4.65	0	0.258113505
EGP_RETAIL_EGP_VALUE_PERC	0.221388	0.05005	4.42	0	0.313485009
Al Tawfeek Leasing Company-A.T.LEASE					
EGP_VALUE_NOFIX_PERC	-0.0421718	0.02082	-2.03	0.0437	-0.123885424
Constant	-0.48569	0.08307	-5.85	0	
FOR_INSTIT_EGP_VALUE_PERC	0	0			0
EGP_VALUE_FIX_PERC	0	0			0
ORDER10	0	0			0
VWAP20	0	0			0
ORDER20	0	0			0
EGP_VALUE_OMNIBUS_PERC	0.0773395	0.0856	0.903	0.367	0.048966249
DS_TOP_PERC	0.906581	0.5169	1.75	0.0804	0.127352911
EGP_VALUE_T0_PERC	0.215799	0.08473	2.55	0.0113	0.13382975
FF_PERC	0.717469	0.2745	2.61	0.0094	0.190195807
FOR_RETAIL_EGP_VALUE_PERC	0.322587	0.05905	5.46	0	0.391564225
EGP_RETAIL_EGP_VALUE_PERC	0.209536	0.04463	4.69	0	0.681708844
EGP_INSTIT_EGP_VALUE_PERC	0.253624	0.04935	5.14	0	0.693438067