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SPEED OF STOCK PRICE ADJUSTMENT TO INFORMATION ARRIVAL IN THE MIDDLE EAST AND NORTH AFRICA STOCK MARKET

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By

AZADEH ERFANIAN

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfillment of the Requirements for the Degree of Doctor of Philosophy

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SPEED OF STOCK PRICE ADJUSTMENT TO INFORMATION ARRIVAL IN THE MIDDLE EAST AND NORTH AFRICA STOCK MARKET

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July 2015

Chairman : Annuar Md.Nassir, PhD
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The 2007/08 global financial crisis (GFC) that originated in the financial sector of United States gradually spread to emerging and developing countries via several economic channels with negative spillovers. Stock market activity is one of which was severely affected due to this financial crisis. The Middle East & North Africa (MENA) region, similar to nearly every region of both developing and developed worlds, was not immune from the systemic effect of GFC. Given its importance as a major supplier of energy on the world market, the MENA region is subjected to adverse effect of financial crises. The region also holds many sovereignty funds operating in the markets of industrialized economies, in addition to being an important market for the goods produced in these economies.

In this the economic environment, the efficient pricing of financial assets is pertinent and there are few research that have been done on the MENA countries examining how financial assets are priced in these countries. One of the important way to looking at pricing efficiency of assets is the speed of price adjustment. Thus, the major aim of this study was to identify the effect of GFC on the speed of price adjustment, and thus to measure the relative market efficiency of stocks listed in the selected MENA countries.

Adopting the speed of price adjustment estimators developed by Theobald and Yallup (2004), this study examines the effects of financial crisis on speed of price adjustment in the MENA countries. The speed of price adjustment was measured during 2005-2012, both including before (2005-2008) and after (2009-2012) the GFC. The speed of price adjustment to both market-wide and firm-specific announcement is also examined in this study.

The auto-covariance ratio estimator exhibits decline in the number of days taken to fully adjust new information in some countries and increase in the number of days in others while the ARMA(1,2) showed an increase in the number of days needed to adjust new information between 2005 and 2009. This study also examined that there is no difference in stock performance before and after the announcement day because in efficient market it is impossible for investors to outperform the market at any time.

The speeds of price adjustment to both types of firm-specific and market-wide announcements are also determined in this study. Four out of six countries proved under-reaction for 2 to 5 days before GFC and 2 to 6 days after GFC while the other showed an over-reaction just for 2 days before and after GFC. Five out of six country revealed under-reaction that persisted up to 3 days before and after GFC while the other country reported over-reaction for just one day. Observations also were made on two different market- wide announcements. Based on ARMA(1,2) four out of six countries revealed under-reaction that persisted from one to days from the day of new information arrival of national annual budget for both before and after GFC. On the other hand two other countries showed over-reaction for 2 days before and after GFC. Interestingly for national general election announcement three out of six countries showed under-reaction and the other three countries revealed over-reaction between one to three days before and after GFC.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

KELAJUAN PEMBETULAN HARGA SAHAM TERHADAP PENERIMAAN MAKLUMAT DI PASARAN SAHAM NEGARA TIMUR TENGAH DAN UTARA AFRIKA.

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Krisis kewangan global 2007/08 yang berasal dari sektor kewangan Amerika Syarikat, telah beransur sebar ke negara-negara membangun dan yang baru muncul melalui pelbagai saluran dengan kesan negatif. Salah satu aktiviti yang sangat terancam akibat krisis kewangan ini adalah aktiviti pasaran saham. Negara - negara rantau Timur Tengah dan Afrika Utara (TTAU), seiring dengan negara-negara maju dan yang membangun lain, juga tidak terkebal daripada kesan sistemik krisis kewangan global ini. Sebagai pembekal tenaga minyak yang terutama kepada pasaran dunia, ekonomi negara – negara di rantau "TTAU" turut terjejas kepada kesan buruk krisis kewangan ini. Disamping menjadi pasaran penting untuk barangan keluaran negara – negara maju, rantau "TTAU" juga mempunyai pelaburan dana kerajaan yang beroperasi di pasaran ekonomi perindustrian maju.

Dalam keadaan ekonomi sedemikian, penentuan harga aset kewangan yang cekap adalah penting dan terdapat hanya beberapa kajian yang telah dilakukan dalam negara-negara TTAU yang mengkaji bagaimana harga aset kewangan ditentukan. Salah satu cara yang penting untuk mengkaji kecekapan penentuan harga aset kewangan adalah melalui kelajuan pembetulan harga. Oleh itu, matlamat utama kajian ini adalah untuk mengenal pasti kesan krisi kewangan global ke atas kelajuan pembetulan harga serta mengukur kecekapan relatif pasaran saham-saham yang tersenarai di negara-negara TTAU yang dipilih.

Dengan menggunakan penganggaran kelajuan pembetulan harga yang dimajukan oleh Theobald dan Yallup (2004), kajian ini menguji kesan-kesan krisis kewangan terhadap kelajuan pembetulan harga di negara-negara "TTAU". Kelajuan pembetulan harga dianggarkan dari tahun 2005 hingga 2012, termasuk sebelum (2005 – 2008) dan selepas (2009 – 2012) krisis kewangan global ini. Kajian ini menguji kelajuan pembetulan harga keatas kedua - dua pengumuman, iaitu pengumuman khusus-firma dan pengumuman luas-pasaran.

Nisbah “auto-covariance” menunjukkan penurunan pada jumlah hari yang diperlukan oleh harga untuk membetul sepenuhnya atas rangsangan maklumat baru di dalam negara-negara tertentu. Hasil kajian ini juga menunjukkan peningkatan pada jumlah hari yang diperlukan oleh harga untuk membetul. Di samping itu, anggaran ARMA(1,2) menunjukkan peningkatan pada jumlah hari yang diperlukan untuk pembetulan harga atas rangsangan maklumat baru di antara tahun 2005 dan 2009. Hasil kajian juga menunjukkan bahawa tiada beza dia antara pencapaian saham sebelum dan selepas hari pengumuman kerana di dalam pasaran yang cekap ia adalah mustahil untuk pelabur mencatat prestasi yang lebih baik dari pasaran.

Kelajuan pembetulan harga untuk kedua-dua pengumuman iaitu, khusus-firma dan luas-pasaran telah ditentukan dalam kajian ini. Empat daripada enam negara yang dikaji telah mencatat “under-reaction” di antara 2 sehingga 5 hari sebelum krisis kewangan global dan 2 sehingga 6 hari selepas krisis kewangan global manakala negara-negara lain mencatat “over-reaction” untuk hanya selama 2 hari sebelum dan selepas krisis kewangan global. Lima daripada enam negara yang dikaji mencatat “under-reaction” sehingga 3 hari sebelum dan selepas krisis kewangan global manakala negara-negara lain melapor “over-reaction” untuk hanya selama 1 hari. Pemerhatian dilakukan ke atas dua jenis pengumuman luas-pasaran. Berdasarkan anggaran ARMA(1,2), empat daripada enam negara menunjukkan “under-reaction” sehingga satu hari dari masa maklumat baru diterima; iaitu pengumuman belanjawan tahunan negara sebelum dan selepas krisis kewangan global. Sebaliknya, dua negara menunjukkan “over-reaction” selama 2 hari sebelum dan selepas krisis kewangan global. Selain itu, tiga daripada enam negara telah menunjukkan “under-reaction” manakala tiga negara lain menunjukkan “over-reaction” di antara satu sehingga tiga hari sebelum dan selepas krisis kewangan global apabila pilihan raya umum diumumkan.

Hasil pencarian kajian ini mendedahkan bahawa krisis kewangan global telah memberi kesan negatif terhadap kelajuan pembetulan harga. Penganggar nisbah “auto-covariance” mempamerkan suatu penurunan dalam jumlah hari yang diambil untuk pembetulan penuh di beberapa negara dan suatu peningkatan dalam jumlah hari untuk pembetulan di beberapa negara lain sedangkan penganggar “ARMA (1,2)” menunjuk suatu peningkatan dalam jumlah hari yang diambil untuk pembetulan maklumat baru di antara tahun 2005 dan 2009.

Kelajuan pembetulan harga keatas kedua – dua pengumuman, ia itu pengumuman khusus-firma dan pengumuman luas-pasaran juga diuji dalam kajian ini. Kesimpulan kedua-dua pengumuman tersebut mempamerkan kesan “under-reaction” untuk semua negara- negara yang dipilih dalam kajian ini.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirements for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

%	Percentage
<	Less than
>	More than
A	Estimates
AR	Autoregressive
ARIMA	Autoregressive Integrated Moving Average
ARMA	Autoregressive Moving Average
ASE	Amman Stock Exchange
BSE	Bombay Stock Exchange
CSE	Colombo Stock Exchange
e.g.	For example
EGARCH	Exponential Generalize Autoregressive Conditional Heteroskedasticity
EGX	Egypt Stock Exchange
EMH	Efficient Market Hypothesis
EN	European Union
FDI	Foreign Direct Investment
GARCH	Generalize Autoregressive Conditional Heteroskedasticity
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GFC	Global Financial Crisis
IFC	International Financial Corporation
IMF	International Monetary Fund
ISE	Istanbul Stock Exchange
JSC	Jordan Securities Commission
KLSE	Kuala Lumpur Stock Exchange

KSE	Kuwait Stock Exchange
LSE	London Stock Exchange
MA	Moving Average
MENA	Middle East & North Africa
MSM	Muscat Stock Exchange
NSE	National Stock Exchange
NYSE	New York Stock Exchange
SDC	Securities Depository Centre
SES	Stock Exchange of Singapore
SPA	Speed of Price Adjustment
UAE	United Arab Emirates
UK	United Kingdom
USD	US Dollar

CHAPTER ONE

STOCK MARKET EFFIIENCY IN MIDDLE EAST AND NORTH AFRICA (MENA) COUNTRIES

1.1 Introduction

1.1.1 Stock Market Efficiency: An Overview

The concept of market efficiency has been a central theme in financial research. Furthermore, it has been a significant issue of debate among stock market investors, analysts and academics. Based on the efficient market theory, all stocks are efficiently priced based on their fundamental investment properties. Moreover, all information pertaining to the stocks are equally available to all market participants. Therefore, in an efficient capital market, investors cannot expect to achieve abnormal profits from their investment strategies on a constant basis. The efficient market hypothesis was first expressed by Louis Bachelier, a French mathematician, in his 1900 dissertation. He observed that the commodity and stock prices move randomly, and explained that stock prices of day zero cannot be the best unbiased predictor of future price movements.

In the 1960s Eugene Fama developed the Efficient Market Hypothesis (EMH). Fama (1965) first defined market efficiency and hypothesized three levels of market efficiency that could possibly typecast the stock markets. According to Fama (1965), an efficient market is defined as a market where there are large numbers of rational, profit-maximizes actively competing, with each trying to predict future market values of individual securities. Furthermore, in an efficient market, important current information is almost freely available to all participants.

Fama (1970) introduced three types of market efficiency; 1) the weak form market efficiency which hypothesizes that information set consists only of past returns; 2) the semi-strong form of market efficiency in which information set incorporates all available public information; and 3) the strong form of market efficiency in which prices reflect information such as inside information that is possible to be known.

The EMH assumptions suggest that all the information pertaining to stocks in the market is simultaneously available to all investors at zero cost. Because investors are rational, they value the securities in relation to their intrinsic value. When investors receive new information, they instantly reflect this information into the price. EMH also suggests that no single investor can earn greater profitability than others with the same number of invested funds; thus, no one can beat the market with all available information.

Market efficiency theory also assumes that prices of assets show the best estimation of markets for the anticipated return of asset and risk. There will be no overvalued assets suggesting lower than the anticipated return or undervalued assets suggesting higher than expected return and. All assets are priced in the market offering optimal reward

to risk. Thus, the best investment policy in an efficient market will focus on the risk of portfolio and return characteristics of the asset. In less efficient markets, an investor can try to spot losers and winners in the market. However, in a better condition, the overall performance of the portfolio will increase by the correct determination of miss-priced assets (Gupta and Basu, 2007).

The efficient market price determination can be contrasted with an inefficient market in which, according to the theory, the pre-conditions for efficient pricing (perfect information, many small market participants) have not been met and prices may be determined by factors such as insider trading, institutional buying power, miss-information, panicked behavior and stock market bubbles.

Hardie showed that government intervention could increase inefficiency of stock markets. Similarly, Moorkejee and Yu (1999a) argued that the ability of allocating funds to the most productive sectors of the economy would be hampered in inefficient market that would impact the growth in long term. In addition to government and investors, companies are also worried about market efficiency. As capital budgeting decisions of companies affect the companies' cost of capital. Thus, the present study aims to investigate the well-being of the stock market in great detail.

1.1.2 Speed of Price Adjustment (SPA) as a measure of Stock Market Efficiency

The price movement in the stock market is a phenomenon that has cut across the boundaries of academic disciplines and has cumulative research evidence spanning almost a century. The analysis and study on how shre prces of lested companes adjust and react to publecly availble informaton, has long ben a center of attinteon in the finonce litareture. The magnitude and direction of the price movement around the time of announcement were focused by many previous studies. There are many studies on the share prace raections or effects and the waelth impacts of deffirent tipes of price senstive anouncement evants.

In addition to the magnitude and direction effects of stock prices to information arrival, another dimension of market efficiency is the SPA that has been less examined. The SPA reflects the investor's reaction to new information during trading, and measures the required time for the stock prices to react (to either direction at any magnitude) and achieve a new level of equilibrium, which incorporates all information into the stock price. Consequently, increasing competition among other markets raised the investors, researchers and stock exchange's concern on the connection between the financial reporting quality and the SPA (Hsieh et al., 2010). Figure 1.1, illustrates the dimensions of market efficiency in terms of quality and speed.

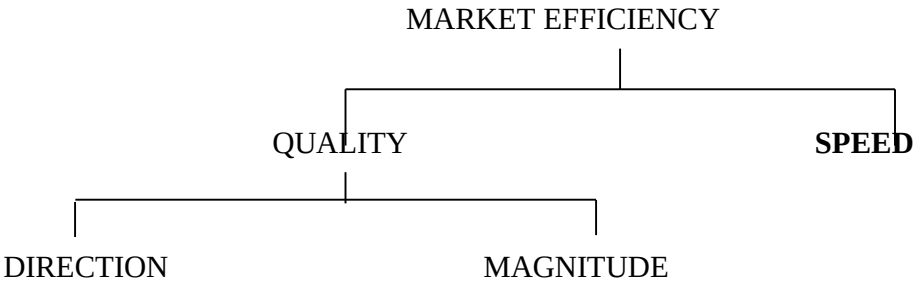

Figure 1.1 Dimensions of Market Efficiency

The SPA is anather importent maesureto detirmine the market efficeincy. The SPA is related to the information distribution of companies and information sharing procedure among the members in the market. In case of symmetric presentation of information by the media, companies and shared information among the market participants, immediate adjustment happens. The market efficiency and SPA can be linked by measuring the quickness of the information inducement. The efficient markets theory predictsthat pirces adujust quicklywith new information arrival. Although theory does not define quickness, it provides a methodologyfor measuringthe speedat which this occurs (Boulter, 2007).

Figure 1.2 describes the market efficiency by capturing the price movement of a typical stock through its adjustment to achieve a new equilibrium point. In Figure 1.2, A shows the price reaction magnitude, B indicates the direction and C refers to the overreaction in terms of speed.

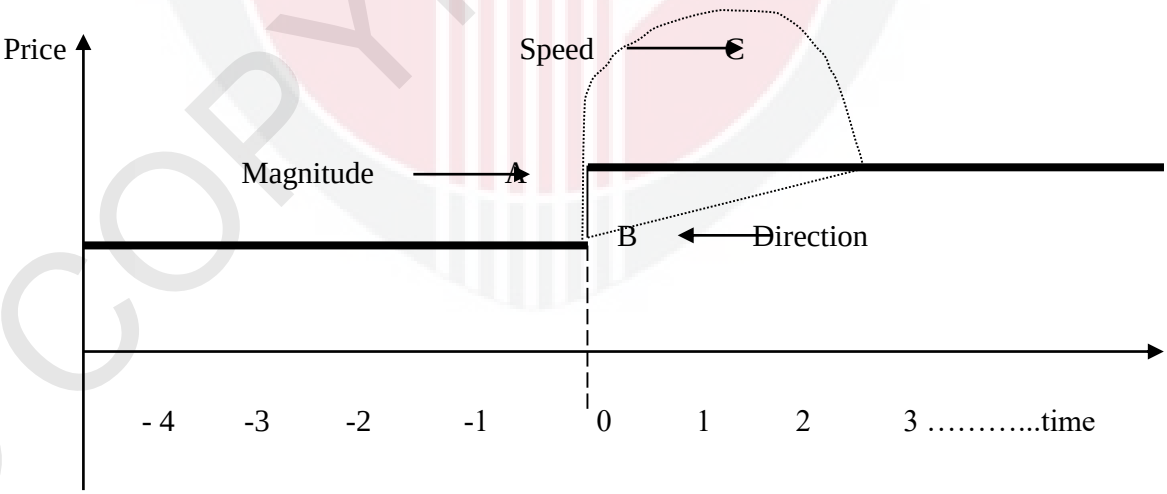

Figure 1.2 Share Price Reaction to New Information

Researchers have attributed the SPA to two main factors: first, price integrity and fairness of self-dealing and fraud; second, the information structures for the exchange prevention mechanism. The information structures are based on the corporate management and companies' disclosure practices. Additionally, the efficiency of the information

structures is affect by the regulators role to augment transparency. In a nutshell, price discovery is based on the characteristics of the market design, traders and companies.

1.1.3 Motivations to study stock market efficiency in Middle East and North Africa (MENA)

Recently, the stock market efficiency analyses on emerging economies have largely developed. However, studies on MENA stock markets are limited. MENA include the Gulf Arab countries, North Africa, the Levant, Iran and Israel. Capital markets of MENA are important both politically and economically. Politically, it is the site of the world most protracted conflicts, the epicenter of world crisis, and chronically war-prone Hinnebusch, 2003, Harrigan et.al, 2006); economically, the vast reserves of natural gas and petroleum make MENA a vital source of global economic stability. Roughly 40% of oil and 20% of natural gas of MENA have been traded internationally (Ratner & Nerurkar, 2011).

Many MENA countries have begun to liberalize their stock markets since the 1990s. This liberalization process has occurred far later in regions such as Latin America and Asia. Few studies have evaluated the effects of stock market liberalization on the economic growth in the MENA region. Achy (2005) empirically assessed the effect of domestic financial liberalization on economic performance in the specific case of MENA countries and found that domestic financial liberalization negatively impacted the private investment and economic growth in Egypt, Jordan, Morocco, Tunisia and Turkey over a period of 28 years, between 1970 and 1998. Neaime (2005) explored whether MENA stock markets can offer international investors the unique risk and return characteristics to diversify international and regional portfolio. His empirical evidence suggested that the Gulf Corporation Council stock markets offer international investors portfolio diversification potentials while other emerging MENA stock markets like those of Turkey, Egypt, and Morocco and to a lesser extent Jordan have matured and are now integrated with the world financial markets. Later, Gentzoglanis (2007) examined the link between the degree of financial openness and economic growth and documented that this link exists only within the group of high income countries but this relationship is rather weak for the low income MENA economies.

Therefore, MENA countries and other emerging stock markets became significant to the world economy and a significant rise was observed in their role in the international financial system (Ben Naceur, et al. 2007). Finally, measures have been designed to raise competition by opening bank capital to foreign participations. It has been expected to increase the economic development through efficient allocation of capital and better mobilization of saving.

Figure 1.3 shows that the capitalization ratio in MENA countries has risen from 15% in 1990 to about 70% in 2010. During the similar period, political uncertainty of MENA countries had continuously impaired their financial markets in terms of their development, liquidity and risk. These countries have been faced with two problems; namely the underdeveloped financial markets and high political uncertainty in attracting foreign

portfolio investments. Therefore, the stock market efficiency and its risk levels on MENA stock markets warrant an investigation. The proposed study could uncover some new knowledge on the relative efficiency of MENA stock markets and suggest the future developments and the expected growth of these markets. Furthermore, no attempt has been done to empirically analyze MENA stock markets.

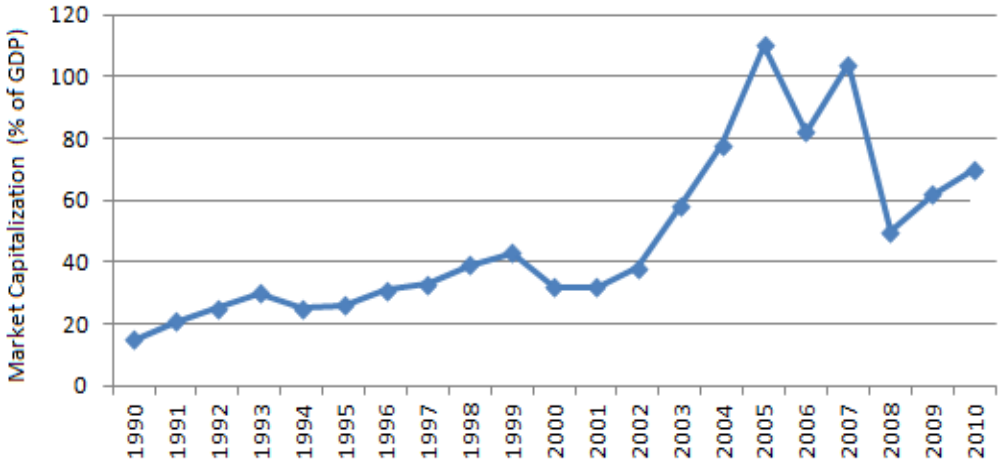

Figure 1.3 Stock Market Capitalization in MENA countries (1990-2010)

1.2 Problem Statement

Discovering the stock prices at any given time in a secondary market is the main function of a stock market. In doing so, determining the stock price that reflects an accurate value is a crucial issue that has been studied for a long time. An efficient market should be able to reflect an accurate stock price at any point in time, and should be traded without much negotiation. The efficient market hypothesis works in a way that it assumes every individual participating in the market has rational expectation and the market mechanism is efficient in processing all information.

Despite the vast body of literature on stock market efficiency and the emerging economies, few studies have been done on the MENA stock markets. Furthermore, no study has documented the MENA stock markets on their risk – return levels and the SPA. Additionally, the legislation environment and the structure of markets under analysis are still immature (Al-Nahlehb and Al-Zaubia, 2010).

MENA countries have faced two problems for financial asset pricing. In one hand, during the last decade, the MENA countries have executed different reform programs to liberalize their stock markets. They have also instituted different determinations to create a center of attention for the flow of foreign direct investment (FDI). Moreover, these countries have provided different incentives, containing custom duty breaks and tax incentives, introduced new investment legislation, implemented privatization and capital market reform programs and relaxed foreign ownership limitation (Hirata et al, 2004). However, MENA trade flows is trivial on a global level. Additionally, underdeveloped institutions

and risk perceptions have hindered the access to capital markets in MENA countries (Maghyereh and Al-Zoubi, 2006). The MENA region stock markets have attained different degrees of progress despite common economic alteration trajectory. This occurs due to their integration in the neighborhood policy of the European Union (EN) (Lagoarde-Segot & Lucey, 2008b).

On the other hand, despite having 45% of global natural gas and 65% of worldwide oil reserves, MENA countries have lack of democracy and dissatisfied progress attributable to the paralyzing mixture of a high level of political disagreement and the strict structure of most of the region‘s regimes (Garber, 2007). Additionally, MENA region has been affected by the global financial crises, as reflected in the decreasing growth rate of both real Gross Domestic Product **(**GDP) and exports. The economic downturn of the MENA region was induced by three factors in 2009. First, the decrease in petroleum oil revenues in the oil-exporting countries due to decreased oil exports and low oil prices. The value of oil exports dropped by almost 40% in 2009, reflecting the decline of both international oil demand and economic growth in the major world markets. Second, the global financial crisis had a damaging effect on the financial sectors and property markets in some MENA countries (e.g. Kuwait and United Arab Emirates), which are intensely linked with world economy, in particular with the strongly affected economic areas (IMF 2010). Finally, the decreasing global financial liquidity led to a reduction of non-oil exports, capital inflows, tourism revenues and workers' remittances, which are the engine of economic growth in non-oil MENA economies.

Thus, a new study on the MENA stock markets is necessary to represent a clear picture of many related issues such as stock markets in the MENA. Furthermore, estimation of speed at the time of a known occasion is a limitation of event studies. If the speed of a regulation that happens at the time of an event is steady with the speed at which prices adjust to all other information, event studies cannot be validated. It is probable that the market responds differently to the random arrival of new information than predicted announcements. Thus, the present study aims to investigate the market efficiency of MENA countries using the SPA as the main investigative tool.

1.2.1 The Investigative Questions of this study

Based on the backdrop of issues affecting the MENA stock markets, the proposed study intends to investigate the following questions from 2005 to 2012, after and before the global financial crisis (2005-2008, 2009-2012):

1. How would MENA stock market efficiency react to the global financial crisis?
2. Are MENA stock markets really efficient based on the SPA measures?
3. Are all MENA stock markets sharing the same level of efficiency?
4. How do market announcements affect the market efficiency in MENA countries?
5. How would the market efficiency react to market-wide specific announcements in MENA countries?

6. How do market Firm Specific announcements affect the market efficiency in MENA countries?

These research questions lead to research objectives.

1.3 Research Objectives

The main objective of this study is to identify the effect of global financial crisis on market efficiency using the speed of price adjustment as the main investigative tool in selected MENA countries. As the MENA stock market experienced financial liberalization in 1990, the speed of price adjustment will be measured from 2005 to 2012.

Pertaining to the robust attributes of the speed of price adjustment estimators developed by Theobald and Yallup (2004), the present study aims to measure the effects of financial crisis at a higher degree of accuracy with refinements to the thin trading effects. Using the mentioned speed of price adjustment estimators to an emerging stock market such as MENA countries to determine the effect of global financial crisis would certainly be a good extension to the contribution of Theobald and Yallup (2004). It also completes existing market efficiency studies on selected MENA stock markets.

Furthermore, to evaluate the properties of the mentioned robust speed of price adjustment estimators, first a number of subsidiary speeds of price adjustment coefficients were determined. Speeds of price adjustment were determined in selected sample stocks of MENA countries based on specific announcements and market wide announcements. These include the study of the SPA to one firm specific announcement, which is purely made by listed companies of MENA countries and two different market- wide announcements, which are based on the macro factors such as economics, political and financial announcements. These factors influence market makers' decisions in buying and selling of shares and other capital market securities.

Speeds of price adjustment coefficients are determined in three different time panels as follows: an overall period of eight years from 2005 to 2012; a sub-period of four years from 2005 to 2008; and a sub-period of four years from 2009 to 2012.

The speed of shared price adjustment coefficients was determined in the following four different comparative angles: the numbre of days token for the shared pirces to be fuly adjusted (i.e. π=1) by (i) Using all selected announcements through the component companies in selected MENA countries to determine the overall market's speed price adjustment coefficient (ii) Using firm specific announcement through all component companies of selected MENA countries to determine how fast the market adjusts to the firm specific announcement, (iii) Using all selected market wide announcements through all component companies of selected MENA countries to determine how fast the market absorbs general announcements, using all announcements through the

component companies of selected MENA countries to determine which country adjusts faster than the others.

The speeds of price adjustment coefficeints are determaned for the semple stock lested in MENA countries. Furthermore, the stimetor provides direct maesure of the degres of price over and underraections in these stock markets. The emperical documientation of over reactions (Bondt and Theler, 1985, 1987), under-reactions (Michealy et al., 1995; Bernerd and Thomes, 1989) has identefied two famelies of pervasive regulareties: underreaction and overreaction. The under-reaction evidence shows that security prices under-react to news such as earnings announcements. If the news is good, prices keep trending up after the initial positive reaction; if the news is bad, prices keep trending down after the initial negative reaction. Oftentimes, participants in the stock market predictably overreact to new information, creating a larger-than-appropriate effect on a security price. Furthermore, it appears that this price surge is not a permanent trend - although the price change is usually sudden and sizable, the surge erodes over time.

1.4 Significance of Study

Stock market performs as a mediator. Channels are also funded by savers and firms who use channels to carry out their projects. Efficient market is an essential condition. Thus, if it is desired, funds should be assigned to the highest-valued projects. This is achievable only if stock prices are resourcefully priced.

Market efficiency is significant because it generates more productivity and less cost to the system. Markets attempt to represent exchange services and goods with the highest utility at the lowest price. Efficiency improves the productivity by permitting suppliers to deliver more services and goods to the market. Efficiency decreases trading frictions and raises competition to produce higher quality, lower prices and higher availability to consumers. Efficiency also decreases risk which impacts costs and productivity.

The market efficiency is significant for investors because it permits them to make more reasonable decisions. The only real way that the investors can earn higher profits through investments in the various markets is by taking advantage of any abnormalities. These abnormalities tend to be removed, but it is a good idea to take benefit of them while they are present.

This study is one of the most important subjects in financial literature. It is necessary for regular traders because if the stock markets are not efficient, there almost certainly will be an arbitrage opportunity. Furthermore, this study would be interesting to the owners that work in a safe market.

Additionally, if results show that the market pricing mechanism is not efficient, the SPA will also not be efficient, and then the effect of policy makers will increase to include role denticulation. Therefore, this study is very important to improve all these

mechanisms to make a market more efficient (hence leads to optimal resource allocation) and to find out the level of efficiency of MENA countries.

The present study uses the SPA method introduced by Theobald and Yallup (2004) to investigate the market efficiency over a period of times. Theobald and Yallup (2004) have well described the need for a new estimator. Several estimators have been later introduced in the literature (Theobald and Yallup, 1998; Brisley and Theobald, 1996; Damodaran, 1993; Amihud and Mendelson, 1989). However, each one of those estimetors suffer from oneor more of the folowing four deficeincies: (1) non-significant testing caused by absence of readily derived sampling distribution (Brisley and Theobald, 1996; Damodaran, 1993); (2) only focuses on the systematic component and has lack of estimation of the total SPA coefficient (Theobald and Yallup, 1998; Amihud and Mendelson, 1989); (3) necessary for full price adjustment at some specified return interval. Thus, it is necessary to preclude the potentiality of under- or over-reactions at longer difference intervals (Brisley and Theobald, 1996; Damodaran, 1993); and (4) subjection to non-synchronicity/non-trading problems (Brisley and Theobald, 1996; Damodaran, 1993; Amihud and Mendelson, 1989).

Furthermore, it is important to test the evolving market efficiency in MENA region stock markets because these markets have been subjected to reform in recent years with a view of improving performance and efficiency. As the OECD (2005) has observed, Countries in the MENA region have been making significant attempts to strengthen their regulatory and institutional infrastructure for capital markets. Originally, many countries did not have institutions dedicated to capital market supervision. However, in the past few years, such institutions have been formed and efforts have been launched to enact necessary laws and regulations and to build human resources in the supervisory agencies.

1.5 Organization of Thesis

The present thesis is structured into six chapters. The second chapter documents a brief history of MENA. The third chapter reviews the literature on the SPA. The fourth chapter describes the data and research methodology. The estimators used in determining the SPA coefficient are outlined, and the data sources are described in this chapter. The fifth chapter presents the empirical results. Finally, chapter six concludes the study.

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