

Country Risk, Risk Assessment, and International Portfolio Diversification in Selected MENA Markets

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ABSTRACT

Since the 1990s, the emerging stock markets attracted large flows of international capital providing investment opportunities for global investors. The thesis investigates the role of country risk composed of political risk (PR), economic risk (ER), financial risk (FR), and Oil in risk assessment for investment opportunities in selected Middle East and North African (MENA) financial markets.

The analysis uses monthly data for Jordan, Turkey, Egypt, Morocco, Saudi Arabia, and Tunisia for January 2005 – December 2018 that includes both the tranquil and crisis periods such as the Arab Spring and the 2008-2009 global financial crises. For this purpose, the analysis is conducted within a two-state regime-switching framework using the Markov-switching international capital asset pricing model (MS-ICAPM). The empirical estimates suggest that investment opportunities vary both with the state of the economy and country-specific risk factors which may be helpful to international investors in their decisions regarding portfolio diversification and to government authorities in their economic policies.

Keywords: Risk Assessment, Country Risk, International Capital Asset Pricing Model (ICAPM), Markov-Switching Model, JEL Classifications: G15, G11, C32.

ÖZ

1990'lı yıllardan bu yana, gelişmekte olan borsalar, küresel yatırımcılara yatırım fırsatları sağlayan büyük miktarda uluslararası sermaye akışını çekmiştir. Tez, seçilmiş Orta Doğu ve Kuzey Afrika (MENA) finansal piyasalarındaki yatırım fırsatları için risk değerlendirmesinde politik risk (PR), ekonomik risk (ER), finansal risk (FR) ve petrolden oluşan ülke riskinin rolünü inceler.

Analizde Ürdün, Türkiye, Mısır, Fas, Suudi Arabistan ve Tunus'un Ocak 2005 – Aralık 2018 arasındaki, Arap Baharı ve 2008-2009 küresel mali krizleri gibi hem sakin hem de kriz dönemlerini kapsayan aylık verileri kullanılmıştır. Bu amaçla analiz, Markov geçişli uluslararası sermaye varlık fiyatlandırma modeli (MS-ICAPM) kullanılarak iki durumlu rejim değiştirme çerçevesinde gerçekleştirilmiştir. Ampirik tahminler, yatırım fırsatlarının hem ekonominin durumuna hem de ülkeye özgü risk faktörlerine göre değiştiğini, bunun da uluslararası yatırımcılara portföy çeşitlendirmesine ilişkin kararlarında ve hükümet yetkililerine ekonomi politikalarında yardımcı olabileceğini göstermektedir.

Anahtar Kelimeler: Risk Değerlendirmesi, Ülke Riski, Uluslararası Sermaye Varlıkları Fiyatlama Modeli (ICAPM), Markov-Değişim Modeli, JEL Sınıflandırması: G15, G11, C32.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller
AIC	Akaike Information Criteria
APT	Arbitrage Pricing Theory
ARAMCO	Saudi Arabian Oil Company
ARCH	Auto Regressive Conditional Heteroscedasticity
BRIC	Brazil, Russia, India, China, and South Africa
CAPM	Capital Asset Pricing Model
CBOE	Chicago Board Options Exchange
CR	Composite Risk
DCREG	Composite Risk of Egypt
DCRJD	Composite Risk of Jordan
DCRMOR	Composite Risk of Morroco
DCRSA	Composite Risk of Saudi Arabia
DCRTR	Composite Risk of Turkey
DCRTUN	Composite Risk of Tunisia
DLJD-DTB	Excess Return of Jordan
DLMOR-DTB	Excess Return of Morroco
DLSA-DTB	Excess Return of Saudi Arabia
DLTR-DTB	Excess Return of Turkey
DLTUN-DTB	Excess Return of Tunisia
DLWI	Returns to Market
EIU	Economic Intelligence Unit
EKC	Excess Kurtosis Coefficient

ER	Economic Risk
FR	Financial Risk
FRED	Federal Reserve Economic Data
FRED	Federal Reserve Economic Data
GARCH	Generalized Auto-Regressive Conditional Heteroskedasticity
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
ICAPM	International Capital Asset Pricing Model
ICRG	International Country Risk Guide
ICSS	Iterated Cumulative Sums of Squares
IEA	International Energy Administration
IMF	International Monetary Fund
JB	Jarque-Bera Statistic
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
LOP	Brent Crude Oil
LR	Likelihood Ratio (LR)
MENA	Middle East and North Africa
MSCI	Morgan Stanley Capital International
MS-DR	Markov-Switching Dynamic Regression
MS-ICAPM	Markov-Switching International Capital Asset Pricing Model
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of the Petroleum Exporting Countries
ORPEC	Organization of the Arab Petroleum Exporting Countries
PR	Political Risk
Q	Q-Statistics of Raw Returns

S&P Index	Standards and Poor Index
SD	Standard Deviation
SK	Skewness Coefficient
UAE	United Arab Emirates
UK	United Kingdom
USA	United States of America
USEIA	United States Energy Information Administration
VAR	Vector Autoregressive
VIX	Volatility Index

Chapter 1

INTRODUCTION

1.1 Background of the Study

This chapter provides a summary of the role of international portfolio diversification within liberalized financial markets at a global level in relation with the aim of the research topic of investigating investment opportunities in selected countries in the Middle East region. For the purpose, the methodology employed and the contributions of the study to the field's body of literature are also briefly introduced in the following sections.

Foreign stocks offer excellent prospects for diversity (Ahearne et al., 2004). Nonetheless, even with the rise in international equity ownership over the past 20 years, investors continue to favour local shares disproportionately in their portfolios (Aviat and Coeurdacier, 2007). This well-known equity home-bias behaviour of investors poses a problem for the philosophy of portfolio selection. However, a substantial body of research justifies the absence of global diversity with logical portfolio selection by citing market social volatilities abroad (Barberis and Thaler, 2004).

Over the recent decades, internationalization and advancements in finance have been crucial in steering portfolio investment in the direction of developing economies and emerging markets regardless of their current economic, financial, and political

difficulties. Such economies, with their capital accounts progressively opened up, began to attract substantial inflows of capital. For instance, following the global financial meltdown of 2007-2008, there has been a dramatic increase in the movement of capital from developed financial centers to developing systems, where there are more lucrative possibilities for investment. The Middle East markets which have been opening up since 1990's to the world markets have been among those attractive regions despite political tensions and economic instabilities in the area. Therefore, a correct measurement of an asset's performance under uncertainties relies, in part, on analyzing its vulnerability to different risks. Within this context, the main challenge in this study is a correct measurement of risk assessment for portfolio diversification in such developing countries. For the purpose of the analysis, the selected markets are from the Middle East for which research is limited, yet, drew capital inflows, especially since the 2007-2008 global financial crises. The sampled countries include Jordan, Saudi Arabia, Turkey, Morocco, Egypt and Tunisia which displayed certain economic, political, and financial unpredictability that are indicative of their country-specific vulnerabilities. However, according to Mousavi Shafae (2022), these countries have diplomatic investment agreements with countries and international bodies such as the United States, the European Union, Russia, and China, thus are good candidates for traders for portfolio investments.

In line with the finance literature, despite increased risk has been linked with greater anticipated returns, weak connections of markets with one another along with complementary markets are crucial for beneficial portfolio diversification for investors (Harvey, 1995). Therefore, the ultimate goal is to assess the investment opportunities in these markets in the Middle East, given their country-specific local factors and other

global factors. The sample period includes January 2005 to December 2018 using monthly data.

1.1.1 International Portfolio Diversification

International portfolio diversification is a strategy that involves investing in a variety of assets across different countries to reduce overall risk (Garali and Othmani, 2015). Therefore, one of the key benefits of international portfolio diversification is that it can reduce the risk associated with investing in any one particular country (Gallegati, 2005). In the context of MENA (Middle East and North Africa) markets, international portfolio diversification can be an effective strategy for mitigating country-specific risks and increasing the overall diversification of an investment portfolio (Khalfallah, 2023). By investing in a diversified portfolio of assets across different countries, investors can reduce their exposure to country-specific risks such as political instability, economic uncertainty, and regulatory changes. Additionally, international portfolio diversification can provide investors with exposure to a broader range of industries and sectors. This can help to reduce the impact of industry-specific risks, such as changes in consumer behavior or technology disruptions. However, another argument in the literature is that capital flows towards emerging markets or newly developing financial centers would be highly volatile due to changes in economic conditions or other local factors that are unpredictable (Santi and Imrohoroğlu, 1974). Volatile capital flows, in return, would cause high fluctuations in stock prices.

Therefore, for investors who consider international portfolio diversification in the MENA markets, it is important to carefully evaluate the potential risks associated with each country and asset class (Lagoarde-Segot and Lucey, 2008). Investors should consider factors such as political stability, regulatory environment, economic growth prospects, exchange rate volatility, and social and cultural factors. It is expedient for

investors to be aware that international portfolio diversification does not eliminate risk entirely. It is still important to carefully evaluate the potential risks associated with each investment and to maintain a well-diversified portfolio that is appropriate for their investment goals and risk tolerance (Assaf, 2006).

In recent times, the world has witnessed a substantial decline in government-imposed investment restrictions and an increase in investment in foreign assets (Hakim and Neaime, 2003). As the world condenses into a global village, countries are increasingly opening up to international business opportunities which present new profitable markets especially those in the MENA region. But many investors would only take up these opportunities only after assessing the risk-return nexus of whichever economy they intend to invest (Bekaert and Harvey, 2000).

The introduction of market-oriented reforms and the adoption of open capital markets have led to significant mobility of capital and enormous capital flows across countries. A major advantage associated with the globalization of investments is the improved efficiency of international capital allocation and increased ability to diversify investment portfolios (Gentzoglani, 2003). A country risk evaluation makes sense as the first step in establishing a global portfolio. Inadequate examination of their particular political, economic, and financial attributes will probably have unfavorable financial effects (Das and Uppal, 2004). In summary, a portfolio diversification will be beneficial when country's business activity is less integrated with the global economic activities and more vulnerable to local changes in the economy, then country-specific earnings should be higher than those of a portfolio invested in the global markets in order to compensate for the local risks (Fisman and Love, 2004). However, recent empirical research also supports the view that financial

modernization initiated since 1990s, the country-level volatility on equity performance was significantly reduced (He and Xue, 2022). In other words, location is less important for investment as the financial markets integrate. Based on the recent developments in the MENA region, specifically, the selected sample countries, lack of data and few empirical research opens a gap in the literature for a better understanding of the investment opportunities in these newly developing financial markets in the region.

1.1.2 Country Risk and Oil Price Risk Assessment

In this study, the portfolio diversification opportunities in the sampled countries will be analyzed with consideration of equity risk exposures to local factors represented by “country risk” and other factors that may be representing the global factors. The term "country risk" describes the possible financial, economic, and political issues connected with making investments in a specific country. As mentioned above, the goal of multinational portfolio diversity is to lower overall risk by making investments in an array of assets located in several countries. Country risk is a major worry in the framework of the MENA (Middle East and North Africa) economies because of political unpredictability, economic ambiguity, and other considerations (Lagoarde-Segot and Lucey, 2007a). Governmental uncertainty, civil disorder, terrorism, natural catastrophes, currency fluctuations, and geopolitical risks are a few variables that might increase a country’s vulnerability in this territory (Gulamhussen et al., 2014). Therefore, it is critical to take into account a variety of aspects when evaluating country risk in the MENA economies, including the country's regulatory framework, infrastructural prospects, human resources, and societal practices. Shareholders must also take into account the distinct risks linked to certain businesses and industry sectors (Olibe et al., 2008). Others supporting the view that diversifying one’s portfolio

internationally is a good way to reduce country risk in the MENA economies include Yu and Hassan, 2008. Therefore, risk assessment in MENA markets is a crucial process for any investor interested in investing in this region. Due to the unique economic, political, and social factors present in the MENA region, the risk assessment process must be comprehensive and take into account a wide range of factors (Bouri et al., 2020). These factors can have a significant impact on investment performance and must be evaluated carefully. Omission of country-risk factor in assessment of risk exposures of equity premium would lead to omitted variable bias in estimating systematic risk. For this reason, this study uses a comprehensive measure of country-risk factor, namely composite risk, (CR) composed of its sub-categories as political, financial and economic risk factors in the assessment of portfolio diversification in the sampled MENA countries.

Another feature of the sampled countries is that Saudi Arabia is a major net oil exporting country, while Turkey is a net oil importing country whose economy is heavily dependent on oil and gas imports. The other country is Jordan which substantially relies on oil imports. The remaining countries are oil producers but not exporters: they are either self-sufficient or import oil in small quantities. In order to take into account the impacts of oil price changes for which there is a huge literature, the analysis is extended to include potential impacts of oil price changes on excess returns of these markets subject to the analysis. According to the finance literature, any factor that alters expected cash flows will be the driver of the valuation of the asset. As a result, any rise in the crude oil price will have a negative impact on their profitability and the value of the stocks (Filis, et al., 2011). The scientific research also draws a line between the effects of fluctuations in oil prices on countries that are net exporters and those that are net importers. Whereas a rise in oil prices is predicted to

have a beneficial effect on net oil-exporting nations as a result of increased oil export earnings, it is evidenced to have the opposite effect on net oil-importing economies owing to a decrease in overall productivity as a result of reduced expenditures and investment in the economy (Filis et al., 2014). However, in the case of oil price shocks, a net oil exporting country may also be adversely affected in terms of reduced oil export revenues (Kilian, 2009). Since the oil price shock (increase) in general, is accepted as a global factor, in the literature, as it affects all prices elsewhere, we retain this assumption in this analysis for all sampled countries. The world market portfolio, on the other hand, and a measure of the investors perspectives about the financial markets known as “fear gauge”, the VIX index are considered as the other global factors affecting the equity premiums of the selected markets.

1.2 Aim of the Study

The problem with international portfolio diversification is the need to effectively manage risks associated with investing in foreign markets while attempting to maximize returns (Krapf, 2015). Investing solely in domestic markets can lead to concentrated risk exposure, which can be mitigated by diversifying across multiple countries and regions. However, international diversification can also introduce additional risks, such as currency exchange rate fluctuations, political instability, and regulatory differences (Balli et al., 2014). The challenge is to develop a diversified portfolio that balances these risks with potential returns and aligns with the investor's risk tolerance and investment goals.

The MENA region presents significant investment potential due to its rich natural resources and strategic location, but also poses risks such as geopolitical tensions, currency and regulatory uncertainty (Hakim and Neaim, 2003). The sampled countries

that are the subject of this research are tiny marketplaces, which are capital-constrained states that have an identical economic trajectory with the Euro-Mediterranean alliance, in contrast to the wealthy, oil-exporting countries of the Gulf Cooperation Council (El-Hamidi, 2004). Within this framework, the aim of this study is to provide an empirical analysis for financial investment opportunities in the selected Middle East markets, namely, Jordan, Saudi Arabia, Turkey, Morocco, Egypt and Tunisia which are newly developing financial markets and share unique country risk factors. The main question is whether these markets are attractive for foreign investors for portfolio diversification given their country risk factors and other global factors as the oil price shocks and the VIX index in addition to the local risk factors. The motivation for this research is limited study for these markets despite some work on the GCC countries in the MENA region.

1.3 Methodology and Contribution of the Study

The financial literature on asset pricing modelling is vast. In this thesis the employed model is the international version of the Capital Asset Pricing Models (CAPM). The empirical applications of the model along with its assumptions and the econometric formulations for the purpose of the analysis will be overviewed in chapters 3 and 4. The International Capital Asset Pricing Model (ICAPM) in this thesis, is applied in two versions: first as the linear model with fixed variance and second as the two-state Markov-switching model where these two states represent high and low volatility states: low-volatility state captures the behavior of the data during the tranquil state whereas the high volatility state captures the behavior of the excess movements of the returns during times of stress or crises periods. Additionally, the model is extended to include the local factors represented by the country risk variable which is the composite risk rate (CR) as well as the oil price changes and the VIX index

representing the additional global factors. The reason for the modification to the standard ICAPM recently employed in the empirical literature is to correctly measure the systematic risk of the sampled countries in the Middle East region based on their features. The need arises due to the rapid expansion of certain emerging markets in the MENA region following the financial capitalization and therefore, the explanatory power of regional characteristics represented by composite risk (CR) and the oil price shocks are incorporated into the model specification.

Based on the characteristics of the sampled countries in the Middle East and the specification of the model at the macro-level, at an international setting, this study is unique in the sense that: first, the ICAPM is augmented to include the composite risk (CR) as a country risk measure and the Brent crude oil price changes and the CBOE VIX index as a control variable, which represents investors' expectations about the financial markets. This modification will allow equity premium risk exposures to various local risk factors of each country and the oil price shocks, an important factor affecting stock markets globally. Additionally, from the methodological point of view, addition of such variables will avoid bias estimation of the systematic risks (betas) for the countries. Second, since a linear relationship of the ICAPM over the sample period seems unrealistic based on the characteristics of the sample period, this is tested by estimating both a linear ICAPM with fixed variance versus a two-state Markov-switching ICAPM. The latter model helps to accommodate for flexible shifts in systematic risk over time depending on the condition of the country and the financial marketplaces.

Additionally, the investment potential in the sampled economies, which are significant players in the vicinity, was examined and contrasted which has not been done in the

past literature. The researcher acknowledges that no other researchers have examined the relationship between the market values of oil and these Middle Eastern countries' exposure to country risk from this point of view.

1.4 Structure of Thesis

This research is divided into five chapters. In the first chapter, the general framework of the study such as the importance of the research topic, the background of the study and the aim of the study are introduced. The second chapter presents an economic overview of the selected MENA countries. The third chapter provides a review of the relevant theoretical and empirical literature. The fourth chapter describes the methodology and data employed. The fifth chapter provides and discusses of the empirical results. Lastly, the sixth chapter concludes and proposes recommendations.

Chapter 2

ECONOMIC OUTLOOK OF SAMPLE MENA COUNTRIES

The MENA region is crisis-stricken, with several of the member countries such as Iraq, Libya, Syria and Yemen currently experiencing civil wars. This has led to a serious refugee crisis, as approximately 15 million people have been forced out of these countries into other neighboring MENA countries such as Djibouti, Jordan, Lebanon and Tunisia, countries which themselves have fragile economies. Egypt, Tunisia, Morocco and Jordan are also witnessing political transitions and are thus forced to prioritize national security above economic growth.

Although the oil-exporting MENA countries that belong to the Gulf Cooperation Council (GCC) except Saudi Arabia, are relatively peaceful, they are also struggling with the after-effects of declining oil prices, as they are mainly mono-economies that are almost completely dependent on oil revenues.

Post-2015, a combination of the aforementioned factors (civil strife, terrorism, refugee crisis and low oil prices) is expected to keep the regional economic growth low. An overview of the economies of the individual countries included in this study are given below.

2.1 Overview of the Jordanian Economy

Jordan is located in the Middle East, with a land area of 92,300 square kilometers (91,971 square kilometers of land and 329 square kilometers of water). Its population was 5.1 million according to the 2004 census which increased to 6.3 million, by 2011 and to 10.45 million in 2018.

Jordan is classified as an untapped market by Morgan Stanley Capital International (MSCI) and Standard and Poor's. The country is on the surveillance radar for probable prospective upgrading as a market that is developing. In accordance with Jordan's stock exchange, there are 277 listed businesses in three major sectors: finance, services, and industries. Nevertheless, the biggest ten corporations accounted for about two-thirds of the overall market capitalization. The significant market capitalization-to-GDP proportion highlighted the significance of the Jordanian market for stocks in terms of the domestic sector (Bouri, 2014; Bouri and Azzi, 2014). The structural flaws that impede stock market activity are mostly attributable to Jordan's bank-based financing structure: since the domestic banks remain to be the primary source of financing, the limited and inadequate capital market fails to offer the optimal environment for enterprises to get access to funds easily for their investments. The Jordanian stock market, including the majority of the MENA equity sectors, has characteristics marked by limited and little trade and potentially fewer adequately informed financiers, despite being comparatively more advantageous in terms of market capitalization, liquidity, and industry portfolio diversification (Bouri and Yahchouchi, 2014). Again, the country's stock market is dominated by banking and service industries, which are less vulnerable to oil risk volatilities.

Jordan is a very small producer of oil, which is merely 402 barrels per day (b/d) while the oil consumption is 114,000 b/d, which make the country a net oil importer which accounts for 40% of its budget. (IEA, Jordan, 2014). The crude oil has the largest share within the country's total imports of energy supplies. Jordan imports oil from Iraq, at a cheaper price than the global market value based on their historical, political and economic relationships.

2.2 Overview of the Turkish Economy

Turkey is predominantly a free market economy. The leading sectors of the economy include industry, services and agriculture. Turkey's main exports include textiles, electronics, automotive and petrochemicals. The country's economy is heavily dependent on foreign oil and gas imports which has a pass-through effect on the prices of other the goods and services via higher cost of production.

Recently, Turkey has been experiencing political turbulence, increased uncertainty and security challenges. These issues have created significant volatility in the country's financial market. The economy is currently experiencing increasing populist spending, credit breaks and decreasing enforcement of structural reforms to the economy. The credit rating of Turkey has been downgraded by three different credit rating agencies due to rising concerns about the state of the economy and the rule of law. In 2001, Turkey suffered a massive financial crisis which forced the country to exit the fixed exchange rate system and adopt IMF-backed economic reforms. The IMF program resulted in strong economic growth with an annual average of 6 percent between 2001 and 2008. The Turkish economy was also quite resilient to the negative effects of the global financial crisis of 2008-2009, with GDP growth averaging 9 percent between 2010 and 2011 (Cevik et al. (2020).

2.3 Overview of the Egyptian Economy

Egypt is the most populated MENA country. Its economy is, however, the fifth largest in the region. The country's per-capita income is also one of the lowest within the region, with approximately 28 percent of the population living below the poverty line. Therefore, Egypt receives relatively large amounts of foreign assistance, mainly from the United States and the European Union, both of which also happen to be the country's largest trading partners. The main challenges facing the Egyptian economy include exchange rate volatility, declining foreign reserves, difficult investment climate, civil unrest and political tension. The country generates most of its revenue from tourism, remittances from abroad, oil and gas exports and taxation. These sources of income have however been strongly affected by global economic downturn and falling oil prices (Assaad, 2009).

Egypt is home to the African continent's sixth-largest recognized oil resources. More than 50% of the aforementioned deposits are located offshore. According to the International U.S Energy Information Administration: Country Analysis Report, Egypt, 2022 (EIA: Egypt Report, 2022) Egypt is the third-largest gas producer in Africa following Algeria and Nigeria. In addition, Egypt has crude oil production which has recorded a declining trend from about 650 thousand barrels per day since 2015. The country, which had been a net crude oil exporter till about 2019 had become a net crude oil importer after this date. This may arise due to lack of recent crude oil discoveries (EIA: Egypt Report, 2022). Unit's (EIU) account Egypt is a part of the Organization of the Arab Petroleum Exporting Countries (OAPEC) but not the Organization of the Petroleum Exporting Countries (OPEC). The central aim of the

organization is to facilitate the transportation of oil and gas and other refined products with increased participation of the Arab member countries in the industry.

2.4 Overview of the Moroccan Economy

The economy of Morocco is open, diverse and market-oriented. It is characterized by low labor costs. The main economic drivers are tourism, agriculture, textile, automotive and phosphate. Morocco has positioned itself as a business hub in Africa through its expansive investment in infrastructure. Since 1999, the country has a relatively stable economy with low inflation, steady growth and reduction in unemployment.

Morocco is a popular destination for both domestic and international investors due to its current industrial and financial growth. The country has relatively stable economy and political environment. Phosphates, fish, silver, and copper are the major resources from nature that are considered wealth in Morocco: the rental revenues from these assets help to maintain a sustainable economic growth. However, the country has to import most of its energy supplies. The U.S. Energy Information Administration (EIA) 2019 reports that Morocco produces only very small amount of oil, natural gas and refined petroleum: its total petroleum and other liquid production never exceeded 5,000 barrels per day while its consumption in 2018 had been 286,000 barrels per day. However, the Maghreb-Europe gas pipeline transporting Algerian gas to Spain passes through Morocco and the country receives natural gas from the pipeline for this transmission. In summary, Morocco is a net importer of oil over the sample period.

2.5 Overview of the Saudi Arabian Economy

The economy of Saudi Arabia is substantially managed by the government. It is a mono-economy that is strongly dependent on oil extraction and exports. The country has 15% of the world's current oil reserves and is the leading exporter of crude oil in the world while it is also the largest producer in OPEC (EIA, Country Analysis Executive Summary: Saudi Arabia, December 2021). The oil sector accounts for, approximately, 42 percent of the country's GDP and 90 percent of its export revenues. Based on the EIA report, 2021, Saudi Arabia's net oil export revenues were \$238 billion (in 2019 prices) in 2018 which started to fall till 2020 as a result of decreases in oil price and oil export volumes over this period. Therefore, Saudi Arabia's economy heavily relies on export revenues received from its exports of petroleum products. Thus, fluctuations in global oil demand, have an indirect impact on company profits and the value of stocks. Consequently, the Saudi Arabia's stock market also shows sensitivity to the international oil trade changes and other events on a global level. In order to reduce its dependence on oil revenue, the country has focused on diversification of its economic activities into power generation, telecommunications, health care, petrochemicals, education and tourism, an action which has been intensified during the recent years since 2018 in response to fluctuations in oil revenues. Yet, as reported in EIA, Country Analysis Report, 2021, the Saudi Arabia affects the world's oil market, as it holds the largest crude of capacity by quickly increasing or decreasing oil production. The country is also a member of the AOPEC.

2.6 Overview of the Tunisian Economy

Due to structural deficiencies, the economy of Tunisia was seriously impacted by the global financial crisis of 2008. The resulting harsh economic climate triggered civil unrest which led to the Arab spring revolution of 2011 (Hamma et al., 2014). The Arab spring revolution was again followed by series of terrorist attacks and worker strikes. The negative effects of these problems were mostly felt through declining tourism receipts, high unemployment rates and diminishing economic growth. Tunisia is actively soliciting for foreign investment and is in the process of fixing its fiscal deficiencies following an agreed extended fund facility with the IMF (Jamal and Milner, 2022).

The Tunisian most developed industry is the power sector allowing access to electricity, almost by the entire population. The state-owned company, STEG, produces 84% of the electricity in the country which is mainly based on natural gas as an input. Therefore, Tunisia is dependent on natural gas imports to meet its energy needs: about 97% of its electricity generation in 2016 came from gas. While most of the gas import is made from Algeria, partly it is met by Algerian-Transmed gas pipeline crossing Tunisia and local production. (IEA, 2021) Domestic production of natural gas and oil are in limited quantities. Tunisia is also a net oil-importing country since 2000. In 2017, oil production was 38,699 barrels per day (b/d), which fell to 38,208 b/d in 2018 (Tunisia, Statista, crude-oil production 2017-2019).

Chapter 3

LITERATURE REVIEW

3.1 Introduction

This section of the thesis presents the existing theoretical and empirical literature on the topic, which offer new perspectives for the research related with international portfolio diversification within the sampled Middle East countries. This part will go into depth on the different analyses done on the theoretical foundations of international portfolio diversification as well as the empirical literature by considering country and oil risk exposures of excess returns within the ICAPM model.

3.2 Review of Capital Asset Pricing Model (CAPM) and International CAPM

A detailed understanding of factors such as differences in returns across assets, the trade-off between risk and expected return, cost of equity capital and portfolio performance evaluation is an essential component of financial operations in most firms as it plays a crucial role in the financial decision-making process (Mullins, 1982). Initially, Markowitz (1959) argued that investors would hold a portfolio with the highest expected return for a given level of risk, the so-called mean-variance efficient portfolio. Based on the seminal work of Markowitz (1959), Sharpe (1964) and Lintner (1965) introduced the capital asset pricing model (CAPM) which provided a means of quantifying the trade-off between risk and expected returns, hence, filling the identified gap in the literature.

The CAPM implies that the expected return of an asset over the risk-free rate must be positively and linearly related to the co-movement of its return with the return of the market portfolio measured by beta, called the systematic risk or the undiversifiable risk. Basic assumptions of the model include that investors have homogeneous expectations and hold mean-variance efficient portfolios and there are no market frictions. This classical CAPM, also implicitly assumes that both investors and assets are in the home country. The empirical literature provided mixed results for the CAPM hypothesis. Therefore, the CAPM has been studied extensively in the literature with regard to the validity of the assumptions of the model and the CAPM hypothesis and the efficiency of the estimated beta (Brennan & Lo, 2010; Cremers, 2001; Dempsey, 2013; Giannakopoulos, 2013; Rossi, 2016).

In this regard, the CAPM has been further developed and new extensions have been made to the original model in various forms. For example, some studies further relaxed the underlying assumptions of the model. Black (1972) introduced a general model in the absence of a risk-free asset. Brennan (1971) considered borrowing and lending rate differentials; Black and Litterman (1992) took investor views on asset returns into consideration. Fabozzi and Francis (1977) and Levy (1974) gave various alternative definitions to the bear/bull market and considered the CAPM over different time periods in order to deal with beta inter-temporal instability. Some others have extended the model by introducing additional firm specific characteristics as explanatory variables such as price-earnings-ratio effect (Basu, 1977), firms size effect (Banz, 1981) and leverage effect (Bhandari, 1988). Fama and French (1995) introduced a three-factor model with factors of market risk, the outperformance of small versus big companies (SMB) and the outperformance of high book/market versus small book/market companies (HML). Furthermore, Ross (1976) introduced

the arbitrage pricing theory (APT) in which asset returns are analyzed via linear models with several risk factors. Another multifactor pricing model is the intertemporal capital asset pricing model developed by Merton (1973) where additional factors to the market portfolio comprise of the state variables.¹

Another important direction of extension of the CAPM model which serves as the foundation for this study is towards the international environment where investors can be in different countries and can invest their funds abroad. The main argument is that while the CAPM performs efficiently in segregated markets, it is not suitable for integrated markets (Bekaert and Harvey, 1995; Grauer, Litzenberger & Stehle, 1976; Peerbhai, 2011; Solnik, 1974). The international capital asset pricing model (ICAPM) is founded on the assumption that international finance theory is a mirror image of domestic financial theory (Adler & Dumas, 1983; Dempsey, 2013). The ICAPM augments the CAPM with each country's index returns, the world index returns and the global risk free rates, thereby accounting for the world market portfolio rather than the domestic market portfolio. Within this framework, the international version of the original CAPM should take into account the differences for tastes of consumption, the exchange rate risks and restrictions to foreign investment, transportation costs and differences in inflation for the international version of the model. A good summary of the ICAPM due to (Stulz, 1981a, 1981b, 1995) that incorporates these assumptions into the model are well explained in Krause, 2001. Under the assumptions that there is law of one price, no differences in tastes across countries, no restrictions on international trade or differences in cost of investment across countries, the ICAPM

¹ There is a large volume of theoretical and empirical literature on various extensions of the model and their empirical evidences which can be found in the finance literature.

can be considered as an integrated market with no influence of different currencies, borders and the purchasing power parity assumption. In the case when there exist differences in consumption, i.e in preferences of investors across countries, however, no barriers to international investment, this model showed that differences in tastes across countries do not influence the real expected returns but only depend on the world aggregate consumption or tastes. Another model developed by Stulz (1991b) incorporates the controls on capital flows for international investment into the ICAPM model. Under these conditions, the assets that have low beta values with the world market portfolio are due to the cost of the barriers to international investment and these assets will not be held by investors as the expected premiums are not sufficient to cover these costs. In order to check for the presence of this assumption, empirical work mostly put emphasis on testing whether the markets are integrated or segmented. A pioneering work is by Harvey (1995) by using the world market portfolio represented by the MSCI world index for 20 emerging markets and obtained low beta estimates suggesting that emerging markets are neither fully integrated with nor are perfectly segmented from the world market. Other research on this topic includes Bekaert and Harvey (1995), Guesmi and Nguyen (2011), Boubakri and Guillaumin (2015) among many others.

The literature extends the classical CAPM towards the international direction in two forms for testing the ICAPM hypothesis. The first extension introduced by Solnik (1974) takes market risks, exchange rate risks and/or inflation risks into consideration. It is labelled as the multi-factor ICAPM. Others, in this category include Agmon (1974) and Lessard (1974). The findings of these studies support the significance of both the local and the international factors in predicting the asset returns. The second extension introduced by Grauer et al. (1976) is called the single-factor ICAPM and

takes only market risks into consideration. The authors conclude that ad-valorem commodity taxes and transportation costs are incorporated in the valuation model and that the international differences in borrowing and lending reflect the differences in risk aversion across the countries.

Several studies have, however, criticized the single-factor ICAPM and concluded that beta alone is not sufficient for explaining the risk-return relationship (Banz, 1981; Basu, 1977; Mondal and Selvaraju, 2019; King, 2009). Recent literature suggest that other factors specific to each country or region than the world risk have more explanatory power in predicting stock market returns, especially in emerging markets (Harvey, 1995; Richard, 1996; De Santis Imrohorglu, 1977; Dimonte et. al 1996; Khalfallah, 2023) For instance, Erb et. al. (1995) explains that the reason is because, some markets, especially emerging markets are not fully integrated with the world market whereas the world beta model assumes the markets are fully integrated. Regarding the sources of local factors, credit risk rating, composite, financial, economic and political ratings are evidenced to play a significant role in expected stock market returns. (Erb et. al 1995; Erb et. al 1996; Bekaert and Camobell, 1997; Li et al., 2008). Erb et. al. 1996 find that while change in political risk rating has some explanatory power in emerging stock markets, the financial and economic risk ratings play significant role particularly in developed markets for their sampled countries over January 1984 – July 1995. In addition, the authors find that the country-risk ratings are correlated with fundamental valuation attributes such as book-to-price ratios in explaining cross section variations in expected returns.

Although, the empirical findings of such studies showed significant deviations from the classical CAPM, it remains as an extensively used tool in finance. However, this

opens other lines of research in the finance theory. One important topic is the instability of beta over time (Brooks et al., 1994; Faff and Brooks, 1998; Faff et al., 1992; Ferson and Harvey, 1993; Mohanty et al., 2011, Zhu et al., 2014). From the technical point of view, different methodologies have been adopted for dealing with the issue of time-dependence, namely autoregressive conditional heteroscedasticity (ARCH) model of Engle (1982) and the generalized autoregressive conditional heteroscedasticity (GARCH) model of Bollerslev (1986). For example, Bollerslev et al.(1988) and Ng (1991) employed the multivariate GARCH model and confirmed that the beta coefficients are truly time-variant. Schwert and Seguin (1990) estimated a single factor model and documented heteroscedasticity and time-varying beta coefficients of the CAPM. As explained in Gray (1996), a key weakness of the ARCH/GARCH family models of Engle (1982) and Bollerslev (1986) is that the parameters are assumed to be fixed over the sample period, so-called single regime. However, if the actual data generating process is state-dependent that changes from one regime to another, a single-regime model will lead to specification problems. Nevertheless, in empirical work, sum of the ARCH and GARCH parameters usually are estimated to be close to 1 which implies persistence in volatility and even some reported this value to exceed 1 (Engle, Ng and Rothschild (1990), Hong (1998) and Gray (1996) demonstrate that the presence of regime shifts may be the reason for misestimation of the GARCH parameters. Thus, results obtained from these GARCH family models may be unreliable during periods of high and low volatility regimes since β coefficient is assumed to be the same in these two different regimes. Later, Brooks, Faff and McKenzie (1998) alternatively applied the Kalman filter model to capture time-varying beta coefficients. However, recent literature suggests that more realistic estimates of systematic risk may be obtained by adopting regime-switching

models as the stock markets react differently under high and low volatility regimes; during periods of low volatility, stock market co-movements are low while under distress, markets tend to be highly correlated. This implies that systematic risk is expected to be regime-switching such that the CAPM may hold conditionally depending on the state of the economy but not hold unconditionally. In this respect, the regime-switching models are able to correctly capture the characteristics of stock market patterns like crashes and jumps.

Thus, recent research on CAPM literature makes use of the Markov-switching (MS) model first proposed by Hamilton (1989) which confirms that beta is time-varying. Also, Huang (2000, 2001) estimated MS-CAPM and confirmed that beta coefficients are different in two different states of the economy. Specific applications of the Markov-switching model in estimating ICAPM include Bekaert and Harvey (1995), Ramchand and Susmel (1998) which contributed to the literature by verifying state dependence of the beta coefficients. Recent empirical work using MS- ICAPM in investigating emerging markets is also extending. Examples include Chen and Huang (2007) which provided strong evidence in favour of state-dependent betas for Taiwan, Malaysia, South Korea and Hong-Kong and Korkmaz et al. (2010) which investigated 23 emerging markets also confirmed that beta coefficients are quite different in two different states for all the countries.

Bekaert and Harvey (1995) with the aid of a conditional regime-switching model proposed a measure of capital market integration that allows the description of expected returns in countries that are initially segmented from world capital markets but later become integrated. They found that several emerging markets display time-varying integration. They also discovered that although there is a common belief that

world capital markets have become more integrated, the assumption does not always hold. Based on this conditional version of the ICAPM, Guesmi and Nguyen (2011) provides an empirical investigation for four emerging market regions, namely Latin America, Asia, South Eastern Europe and the Middle East for a period of 31 March 1996 – 31 March 2008. The authors concluded that the degree of market integration varies over time suggesting partial integration of these regions with world market and that diversification into emerging markets continue to be attractive. Their conclusions provided empirical support for the conditional ICAPM proposed by Bekaert and Harvey (1995).

3.3 Link between Country Risk and ICAPM

This section will discuss the role of country-specific risk factors composed of political, economic and financial risks which represent local factors unique to each country or region. In this context, definitions for each sub-category will also be presented, in order to better comprehend the concept of “country risk exposure” used in this analysis. In addition, the empirical literature related to the impacts of local factors within the ICAPM framework will also be summarized within this section.

There are several factors that influence investors to resort to investing their resources in the global economy instead of concentrating on the domestic market alone. Within an international setting the finance literature also extended investigating the impacts of country specific risks on stock markets. Among many others, such studies include Erb et. al. (1996a, 1996b); Hasan et. al.(2003), a few to name. For instance, an earlier research by Erb et al. (1996a) analyzed expected returns and volatility in 135 different markets by using country credit risk as a proxy for risk exposure of segmented developing countries from 1979 to 1995. The authors argue that the country risk,

measured as country credit rating, captures the influences of political risk, exchange rate volatility and controls, its economic conditions and its sensitivity to international exogenous shocks among various other factors. The authors' definition of country risk exposure includes the political, financial and economic risk factors that emphasizes the role of these factors on expected stock returns. Later, Erb et al (1997) assert that country's political, financial and economic risk factors are good proxies for explaining variations in their expected returns and are useful for investors in their decisions of country selection for an international portfolio diversification. Another research that investigated the portfolio diversification opportunities in the ten Middle East and African countries by Hasan et al. (2003) assessed the implications of country sub-category risk factors. They found that the political, financial and economic vulnerabilities greatly predict the riskiness in stock returns and their probabilities in terms of their yields. In addition, their findings provide beneficial investment opportunities for the analyzed countries, namely, Cote d'Ivoire, Egypt, Jordan, Morocco, Kenya, Tunisia, Turkey, Nigeria, South Africa and Zimbabwe, over the sample period of 1984-1999.

A recent article by Khalfallah, (2023) found that for Egypt, Morocco, Saudi Arabia, Turkey, Tunisia and United Arab Emirates, the local factors played an important role in determining the risk premium and these markets were partially integrated with the world

According to the definition of the International Country Risk Guide (ICRG), the country risk is represented by the "Composite Risk" which is calculated by 50% contribution of the political risk rating while economic and financial risk ratings each contribute by 25%. A higher value of the index indicates lower risk.

3.3.1 Political Risk Factors

The political risk (PR) rating is a measure of the host country's political environment. It includes some macro-assessments like government stability, socioeconomic conditions, external and internal conflicts, corruption, law and order, military in politics, religious and ethnic tensions, democratic accountability and bureaucracy quality.

Bailey et al. (2005) examined the performance of global mutual funds taking into account country-level political vulnerabilities in globally invested mutual funds that are managed in the United States markets. The authors applied the improved incident study approach and utilized portfolios instead of single funds and concluded that the higher-level politics of concern is the occasion of Iraq invading Kuwait. They argue that global investors in equity funds gain significantly higher yields even in the presence of increased political tensions in these economies. The results prove that investors stand the chance of profiting higher in return in unstable political climates.

Additionally, Erb et al. (1996b) evaluated the impact of political uncertainty limits on the return on investment of a worldwide stock portfolio. The authors analyze a sample of 36 nations using monthly information on political risk assessments and market returns spanning the months of April 1982 to December 1991. According to their research, the risk-return properties of optimum portfolios are enhanced by diversification amongst politically perilous states. They advocate utilizing political risk variations rather than sovereign rates of return as a measure for political risk, nevertheless, because employing the former may result in duplicate reporting of risks. Sidki Darendeli and Hill (2016) examined the impact of market and non-market engagement on the credibility of foreign firms during periods of political turbulence

utilizing the prior-after normal experiments provided by the Arab Spring in Libya. They argue that establishing effective societal friendship is a means of attracting investment into one's economy irrespective of the shocks posed by the political climate in a particular economy. They found that individual MNEs who additionally made investments in businesses that had some benefits for society in general and in social connections with household members with little connection to the Qadhafi household gained a broad-based credibility which assisted them to endure Qadhafi's unseat. Their conclusion adds to the knowledge of political risk and the conduct of politicians by supporting the idea that a company can reduce its exposure to political instability by working to increase its credibility, particularly in the viewpoints of players from the social sphere. Theoretically, the results lend credence to the idea that the regime-based route to foreign business credibility should be supplemented with a business that is a socially-centered approach to firm credibility in the destination nation. The paper proved practical implications, suggesting that MNEs at high political risk might increase their chances of sustainability by cultivating partnerships with prominent social organizations and providing services and products that are valued by the public.

However, there are some scholars who hold divergent views on the aforementioned conclusion. They have also offered evidence against the claim that overseas investors would benefit from a politically unstable environment. On the contrary, Daniels et al. (2014) for instance is of the opinion that the philosophical and political structures of many emerging economies are not as stable as those in advanced economies. As a result, the stakes are raised to a level that many investors aren't comfortable with. A political coup in an emerging country, for instance, may cause a 40% drop in the stock market.

3.2.2 Economic Risk Factors

The choices to diversify an international portfolio are heavily influenced by economic reasons. International portfolio diversification is influenced by a number of economic factors. Driessen and Laeven (2007) examined the medium through which the gains from global portfolio investment could be different from one economy to the other considering the viewpoint of domestic investors and found that portfolio diversification choices can be affected by interest rate variations between economies. They argue that investment from other countries is encouraged when interest rates are high and discouraged when they are low. Investments priced in international currencies may be vulnerable to changes in exchange rates. Diversifying a portfolio across many currencies can help mitigate the effects of fluctuating exchange rates. Changes in the worth of foreign assets and liabilities due to fluctuations in exchange rates has always proven to be impactful on international businesses.

Depending on how the value of one country's currency fluctuates relative to another, foreign investors may make or lose money (Aviat and Coeurdacier, 2007). Rising inflation may consume away the purchasing power of money, rendering investments less appealing. Investors who value stability may find low-inflation economies more appealing. Trends of expansion in the economy are one factor that can inform the decision to diversify a portfolio. Investment returns could be greater in places with robust economies compared to those with stagnant or declining economies. In addition, the stability of the political system is an important consideration for investors. Investors who are looking for long-term gains are more likely to put their money into a country with a stable governance regime. According to (World Bank Group, 2022) investment gains and uncertainties are affected by the development and long-term health of economies around the world.

Markets with better growth and stability are more appealing to foreign investors because they offer higher profits with reduced uncertainties. Variations in national regulatory climates might influence portfolio diversification choices. Economies with clear and consistent regulations could prove more appealing to businesses. Al-Mohamad et al. (2020) corroborated this view and provided that differences in accessibility to markets and competition between nations as a result of their trade and investment policies is an essential factor to influence an international investment decision. Financial inclusion and expansion of the economy can be encouraged by measures that encourage free trade and international investment, while they can be stifled by those that do the opposite (Batten and Vo, 2016; Daly and Vo, 2013).

Decisions regarding investments can be affected by a market's size and liquidity. Investors who want to spread their risk across a wide variety of assets may find larger and increasingly liquid economies more appealing. Other scholars such as Al-Mohamad et al. (2020) posit that other economic indicators include the extent to which international trade and investment affect one another and the connection of profits and risks in global markets. The advantages of diversification are diminished as integration increases and are increased when integration decreases. The decision to diversify an overseas portfolio is heavily influenced by economic variables. In order to prevent loss and increase gain, investors thoroughly examine these aspects.

3.3.3 Financial Risk Factors

Despite the fact that diversifying a portfolio can reduce aggregate risk, there continue to be a number of financial risk elements that can have an effect on it. Market volatility is the general turbulence and erratic behavior of the financial markets. Market volatility may have diverse effects on various asset classes (Erb et al., 1996b). For instance, stocks have a history of being more unpredictable than bonds. Market

risk might influence both the return on certain assets and the profitability of the entire portfolio. Sector risk is also related to the particular markets or industries where investments are undertaken (Alsuhaibani et al., 2023). Certain industries may be more impacted than others by developments in the economy or regulations, technological upheavals, or adjustments in customer tastes. Excessive reliance on one industry makes a portfolio more susceptible to industry-specific hazards (Bouri, 2014).

There is also the issue of credit risk with respect to considering issues related to financial uncertainties. It is the chance that borrowers would stop making payments on their debts. When an investor decides to put financial resources in fixed-income instruments like corporate or government bonds, it is especially important to consider this possibility. Credit risk could be increased for a portfolio that has substantial exposure to bonds with lower ratings or issuers that have a higher likelihood of default (Bartram and Dufey, 2001).

The aspect of liquidity risk develops when it takes a lot of time to acquire or sell an asset without significantly changing its price. A portfolio may be subject to liquidity risk if investments are made in assets that are not liquid or in markets with little activity. Liquidity risk can increase during times of financial strain, making it difficult to exit positions at favorable prices. In situations where investments are made using various currencies, currency risk occurs. The value of investments can be impacted by exchange rate movements. Changes in exchange rates can have an effect on returns when converted back to the investor's base currency if a portfolio contains a sizable amount of exposure to foreign currencies (Hearn et al., 2010).

Geopolitical developments such as wars, political turmoil, trade disputes, or changes in policy could have an enormous effect on the market for financial securities. The diversification of a portfolio additionally makes it vulnerable to macroeconomic factors like inflation, interest rates, and recessions. These risks could have a significant impact on a number of asset classes. The phrase "event risk" refers to the potential outcomes of unforeseen happenings like natural disasters, terrorist strikes, or business scandals. These incidents could have abrupt and severe consequences for certain companies, markets, or even whole sectors. A diversified portfolio can assist in reducing event risk by spreading investments throughout a variety of assets (Assaf, (2009).

3.4 Country-Level Risk and International Portfolio Investment

There is a close association between the two financial notions of country-level risk and international portfolio diversification (Sarno et al., 2016). The political, economic, and financial uncertainties and swings in the economy of a nation are the sources of country-level risk (Chinn and Ito, 2006). By spreading investment capital over a number of nations, or "asset classes," international diversification can help mitigate portfolio uncertainty and risk. The advantages of worldwide portfolio diversification derive from the reality that the favorable correlation between stock returns between nations is substantially lower than within any given country (Forbes and Warnock, 2012). This implies that the ups and downs of one country's economy might be balanced out by the downs of another, resulting in a more consistent rate of return. More specifically, according to Driessen and Laeven (2007) investment in assets from multiple nations, or "international portfolio diversification," can lower the portfolio's aggregate risk and instability arising from the substantially lower correlations across

economies than within a given country leading to a worldwide portfolio diversification beneficial to all investors.

However, currency volatility, transaction costs, information asymmetry, and regulatory barriers are just a few of the difficulties and expenses that come with a globally diversified portfolio. Based on the above market conditions, traders should consider the pros and cons of spreading their investments over a number of countries whose risks vary widely. As reported by Fratzscher (2012), an investor's willingness to take risks, time horizon, investing targets, and preferences can all influence the ideal level of foreign portfolio diversity. Therefore, the political, economic, social, and environmental characteristics of a country contribute to the unpredictability and fluctuation of asset returns known as "country-level risk."

Jagannathan and Ma (2003), provide an explanation how investment risk can be mitigated with the use of a diversified foreign portfolio. For example, if American stock markets do poorly, a shareholder can offset that risk with gains from their international assets. For instance, a common strategy is to divide a portfolio into equal parts as domestic and international investments. An investor might see a ten percent decrease in their domestic portfolio but a twenty percent gain in their international holdings, for a total return of 10%. Simply, adding a mix of equities from both established and developing nations to a global portfolio is a good way to diversify and lower risk (Maghyereh, 2006).

Another important point in international investment is that when assembling a global portfolio, investors essentially acquire the local currency where the companies are listed. Someone who invests in a stock traded on the trading floor of the London Stock

Exchange, for instance, might see their investment rise and fall in tandem with the price of the British pound. When the dollar declines, an international portfolio can help even out the impact. A global portfolio gives you exposure to the ups and downs of markets around the world. Li et al., (2003). It is not uncommon for investors to seek for chances in emerging markets like Latin America and Asia, where they anticipate capital inflow and commodity demand to boost local economies.

3.5 Country-level Risk Movement and Stock Prices

The research on the influence of country-level risks on local stock markets is limited, especially for developing countries like those in the MENA region, even if the implications of corporate rating agencies on individual stock values have been thoroughly examined, in industrialized countries (Assaf, 2014). Erb et al. (1995, 1996a, 1996b) have investigated the ability of country credit rankings to predict anticipated equity gains. In their earlier work, Erb et al. (1995) the authors claimed that country credit score can aid in differentiating between economies with higher and lower anticipated returns. They discovered a 12% point differential between the portfolios with the greatest and least credit risk. The connection between anticipated earnings and country credit score was formally examined by Erb et al. (1996a). Although country credit scores hinge on surveys, they proposed that they could be utilized as ex-ante indicators of underlying hazards. By merging all the nations and assessments into one sizable model, they evaluated a cross-sectional, time series predictor of national stock market index performance on country risk for 47 different nations using Institutional Investor's semi-annual country risk estimates. They discovered a scientific connection between country credit score and anticipated returns, and they utilized this link to set hurdle levels for investments in initiatives with a median risk in developing nations.

Erb et al. (1996b) conducted a disaggregated analysis to look at the correlation between future equity returns and political, financial, and economic uncertainties. The authors used political risk, financial, economic risk and composite risk sourced from the International Country Risk Guide (ICRG) and Institutional Investor's country credit ratings. They discovered that the financial risk element of ICRG has the highest economic content predicting future equity returns with a negative relationship showing that a greater financial risk ratio (or lower financial risk score) is linked to better gains. They also found high significant correlation between country risk measures and the equity returns leading the authors to conclude that value-oriented strategies play an important role for higher returns.

Studies examining the impact of sovereign credit scores on country equity markets are scarce. The impact of modifications to sovereign rankings and perspective on the volatility of developing financial economies was investigated by Kaminsky et al. (2001). They discovered that modifications in sovereign scores and prospects had a big impact on the bond and stock marketplaces. Bond yield spreads typically rise by 2% following a local downgrade, while stock returns fall on 1%. They also discovered that modifications to risk ratings have a contagious and spillover impact. The influence of sovereign scoring modifications on the overall stock market was examined by Brooks et al. (2004). They conclude that whereas rating increases show minimal indication of atypical return conduct, downgrades of a country's ratings have a large and detrimental effect on local stock marketplaces. However, according to Bouri et al. (2020), sovereign rating reductions have little to no effect on stock and exchange rate yields. This is likely since markets expect rating shifts, thus prices generally account for the details.

Global debt and stock economies have been shown to be impacted by modifications to sovereign debt ratings (Ferreira and Gama 2007; Gande and Parsley 2005; Li et al. 2008). A shift in one nation's sovereign credit scores may have an impact on other nations' sovereign credit spreads, according to Gande and Parsley (2005). They revealed that shifts in one nation's rating do have an impact on other nations' sovereign credit gaps.

The consequence is asymmetrical, though: Positive grading adjustments have little effect while negative grading shifts are linked to a rise in the distribution of credits. Ferreira and Gama looked into how shifts in a country's sovereign debt ranking and forecast affected stock market performance in other nations. Their findings are in line with the findings from Gande and Parsley (2005), who found that a 1% increase in credit score drop is typically accompanied by a 51-basis mark decline in return on investment in other nations.

In their 2008 study, Li et al. looked into the impact of shifts in sovereign credit ratings on local as well as global marketplaces for stocks. They discovered that shifts in sovereign credit ratings indeed have an impact on both domestic and international stock markets and that the impact was amplified throughout the 1997 financial crisis. The sovereign credit scores from Standard & Poor's were utilized in all three investigations. Based on variations in disclosures and securities regulation, Hail and Leuz (2006) looked at cross-country disparities in the prices of capital invested in equity. Following Erb et al. (1996a), they contrasted these figures with their inferred expenses for capital estimations using the yearly values fitting the regression of semi-annual returns on stocks on Institutional Investor's semi-annual country credit risk scores as a substitute for prospective projected gains. Despite the fact that they were

estimated using various techniques and factors, they identified a strong and significant correlation between both of the parameters.

The question of whether changes to macroeconomic factors are assessed in the stock market was investigated by Ferreira and Gama (2007). They put forth a number of pertinent factors and discovered a time series of unexpected motions. They discovered that a number of factors, including industrial production, shifts in risk premium, yield curve kinks, indicators of unexpected inflation, and shifts in predicted inflation, have a consistent impact on stock market outcomes. Regarding the subject of our study, it is feasible to believe that these variables are essentially integrated into the political, financial, and economic threat elements; hence, it is reasonable to anticipate considerable correlations between indices of the stock market fluctuations and these variables of risk.

3.6 The Relationship Between Oil Price Movements and Stock Market

Based on theoretical finance literature asset prices are affected by any factor that influence their expected cash flows (Fisher, 1930; Williams, 1938). Accordingly, higher the cash flows are, greater is the value of a stock, given other factors do not change. Therefore, an increase in crude oil price will increase the cost of production and lower profits and stock prices (Filis et al. 2011). The empirical literature also distinguishes between net oil exporting and net oil importing countries, regarding the impacts of oil price shocks (oil price increase) on their economies: an oil price shock is expected to affect a net oil importing country negatively through higher costs of production, depressed consumption and investments, while this would increase the export revenues of a net oil exporting country and affect it positively in general. (Hamilton, 1988 and 1996; Kim and Loungani, 1992; Houker, 2002).

There is an extensive body of literature regarding the impacts of oil price volatility on the economies of countries, pioneered by Hamilton (1983) which show mixed results. (Among many others, Hamilton, 2009a, 2009b). Recent empirical research also investigates the link between oil price movements and stock markets. For instance, Filis, 2011 is among many others reporting positive association between oil price shocks and stock returns. However, there are also other research agree that oil price shocks have a negative effect on their stock market activity (Ahmed and Mohammad, 2022; Broadstock and Filis, 2014). There is growing research on emerging markets on this topic which include both the GCC countries that are net oil exporters (Hammoudeh and Choi, 2006; Mohanty, 2011; Arouri et al., 2012; Arouri, 2012) and Turkey, which is a net oil importing country (Cevik et al, 2020). While the net oil exporting GCC countries are mostly reported to be affected positively from oil price shocks, Turkey is reported to be very sensitive to oil price shocks.

External oil production safety can be threatened by factors such as economic and social unrest. A large number of studies (Sun et al., 2003; Bouchet et al., 2003; Breunig and Chia, 2011) have examined the aforementioned instability as an element of risk to nations in oil-exporting economies. The prospective exporting capability of each oil provider is an additional crucial risk element of oil suppliers that impacts oil-importing countries, as shown by prior research (Jansen et al., 2004; Blyth and Lefevre, 2004). These insightful investigations have been greatly an inspiration for this current study, which attempts to incorporate country-level risk by applying the ICAPM risk assessment tool to determine investment possibilities by international investors within the MENA region.

Prospective export possibilities are directly tied to the actual accessibility of oil for buyers, and it is a reflection of a supplier's oil reserves, drilling abilities, and export policy. According to Logar and van den Bergh (2013) a fall in oil prices nevertheless will cause consumption to rise quickly during period of low volatilities in financial, economic and political risks. The total number of countries that are net exporters of traditional crude oil is expected to decrease as we near a production limit (Logar and van den Bergh, 2013; Hallock Jr., 2004; de Almeida and Silva, 2009; Zucchetto, 2006; Tsoskounoglou et al., 2008; Sorrell et al., 2010; Matsumoto et al., 2012). If you want to ensure the long-term viability of your oil importation it is a good idea to develop stable trading connections with oil suppliers who have a high possibility of exporting. Conversely, if you depend significantly on local oil vendors, you may find yourself in a position where you need to seek out other providers.

As oil reserves decline, several previously reliable minor oil exporters have begun cutting back or have switched to being oil importers themselves. This has forced some previously reliable oil importers to seek out new oil producers to compensate for the shortfall. Thus, the accessibility of resources is equally important for ensuring reliable energy supply. Jansen et al. (2004) look at the depletion of resources as a measure of long-term power supplies security, and Blyth and Lefevre (2004) suggest that every supplier's ability to export is a crucial consideration when considering the possibility of importers switching providers. Thus, oil import diversification needs to take into account the possibility of exporting each supplier.

However, authors like Ozturk and Arisoy (2016) on the other hand argue that oil prices are sensitive to economic growth. They find that Turkish imports of crude oil are more sensitive to fluctuations in income. According to this finding, imported crude oil is a

common good, and growing income patterns will encourage greater usage of goods that depend on oil such as vehicles and other related services in the economy. According to the study, income develops more slowly than the use of imports of crude oil. Eventually, this causes the oil intensity to decrease.

3.7 Assessing Risks in the MENA Region

More focus is being placed on researching the traits, behavior, and volatility dynamics of the MENA area. The significance of these sectors for risk management, portfolio evaluation, and market efficacy has been examined in recent work. For instance, Hammoudeh and Li (2008) utilized the iterated cumulative sums of squares (ICSS) to study the abrupt changes in volatility for five Arab stock exchanges in the Gulf region and examine their effects on the predicted persistence of volatility. The majority of the Gulf Arab securities have been shown to be more susceptible to significant global occurrences compared to local regional factors. For instance, the 1997 Asian financial crisis, the ensuing crash of oil prices in 1998, OPEC's decision to implement the price band policy in 2000, and the Gulf economies have been proven to constantly be impacted by the September 11th attacks.

A group of seven developing MENA stock exchanges were the subject of an investigation by Lagoarde-Segot and Lucey (2008) into the effectiveness of information. Using a multinomial linear logistic regression approach, they examined whether the liberalization of the economy, corporate responsibility, and market growth influenced the latter. Their findings showed that there were numerous degrees of productivity in the MENA equity markets, and the effectiveness of each index appeared to be primarily influenced by corporate oversight and market broad terms, which are elements that are connected to the flow of knowledge.

By contrast, variables linked to the overall economic liberalization process do not seem to have explanatory power. Lagoarde-Segot and Lucey (2008) showed that Turkey and Israel showed the strongest evidence of weak-form efficiency. These markets were followed by Jordan, Tunisia and Egypt, with Lebanon and Morocco lagging behind. They associated that with the fact that Turkey and Israel are endowed with more liquid and capitalized stock markets and have well-developed financial systems. Strong capitalization in Jordan is offset by the presence of an underground market and the recognition that corporations account for 50% of the nation's market capitalization. Minor markets include the nations of Tunisia, Egypt, Lebanon, and Morocco, though a limitation of these findings is that they fail to adequately take into account recent changes at the Cairo Capital Market.

Brooks (2007) used the APARCH approach to examine the validity of the concept to a group of developing nations, which include those from the region known as MENA. These were his research results. First off, unlike advanced economies where it would seem sensible to use a conditional standard deviation model with a capacity factor of cooperation, developing economies exhibit a significantly higher-level autonomy rating. In addition, there are certain emerging economies for which estimated issues related to an irregular conditional error probability are of concern, in contrast with established economies where irregular conditional loss probabilities seem to match the information effectively, conditioned to distribution, and it seems that a conditional normal distribution is the best choice. Thirdly, there seems to be a range in the amount of fluctuation imbalance among developing economies, with the Middle Eastern and African markets showing significantly distinct fluctuation imbalance traits from those of the Latin American economies.

53 equities markets, especially those in the MENA region, were utilized by Nikkinen et al. (2008) to analyze the immediate impacts of the September 11 attacks on stock returns and fluctuation. They discovered that the operations' effects led to appreciable rises in fluctuation across areas and throughout the research time. However, short-term return on equity were significantly negative before soon turning around. However, they discover that the effects of financial sector attacks differed among countries, suggesting that places (such as MENA) that are less connected with the global economy are less vulnerable to disruptions. They said that the MENA region offers the best profits and the least amount of fluctuation for investors. When contrasted to each of the additional regions, it exhibits significantly greater stock returns and reduced volatility.

The MENA area, either immediately following the attacks or even over a longer period, exhibited the lowest fluctuation in the post-September period if compared to other regions. In terms of stock returns, MENA has statistically substantial positive returns on equity in comparison to any other sector after the attacks. For three months after the assaults, the MENA area appears to do much worse than other regions over a longer period of time. And six months after the assaults, the MENA region continues to fare worse than other regions. According to Domowitz, Glen, and Madhavan (1998), the MENA area is often regarded as one of the developing economies, which are typically much smaller, less liquid, and more unstable than recognized global securities markets. Additionally, there is growing indication that these markets may be less informationally efficient due to low-quality knowledge, expensive trade, and a lack of market rivalry, as well as the fact that their economic structures frequently diverge significantly from those of developed nations. Furthermore, nations that are emerging frequently have very different industrial systems than industrialized ones.

A distinct trend from that seen in industrialized stock markets could result from all of these factors and others. Surveys on rising nations have evaluated VAR using a parametric approach; however, the MENA nations have utilized them less frequently. Naieme (2012) found correlations between time-varying fluctuation as well as anticipated returns in a sample of three developed and seven emerging markets in the MENA area. The researcher additionally discovered that trading is one of the interactions across time-dependent with regard to volatilities and anticipated returns. Additionally, he pinpointed the prevalent causes that give rise to the region's economies' fluctuation. A panel linear autoregressive paradigm was used by Guyot et al. (2014) to demonstrate how the cost of equity transfers monetary fluctuations in the MENA region.

Chapter 4

DATA AND METHODOLOGY

4.1 Data

This study covers six countries, namely Egypt, Turkey, Jordan, Tunisia, Morocco and Saudi Arabia, all located in the MENA region. The selection of the countries for the analysis is based on the Morgan Stanley Capital International (MSCI) classification of countries as emerging and frontier markets in the MENA region that have experienced some political/economic problems such as the Arab Spring or some other local instabilities. Based on the MSCI index² that is constructed to measure equity market performance of regions/countries, the frontier markets are Jordan, Morocco and Tunisia, and the emerging markets are Saudi Arabia, Egypt and Turkey.

The economic prospective of these sampled countries are different and unique to the specific country. For instance, Saudi Arabia is a net oil-exporting country with a rich Persian Gulf basin market, while Turkey, Jordan and Egypt are non-oil exporting countries, among which Turkey is highly dependent of oil import. Tunisia, Turkey and Morocco have been perceived as the most integrated countries with Europe than with the rest of the MENA countries. Jordan and Egypt have strong economic relationships with the Persian Gulf region.

² Free float adjusted market capitalization weighted index

The data is monthly stock indexes of the countries from January 2005 to December 2018. The world index is used to proxy the market return which is obtained from MSCI. The 3-month US T-bill rate which is a proxy for the risk-free rate is obtained from the Federal Reserve Bank of St. Louis Federal Reserve Economic Data (FRED) database. All the data used are denominated in US dollars to maintain consistency and to capture the currency risk.

The composite risk rating and its sub-categories as political, financial and economic risk ratings for the sampled countries are obtained from the International Country Risk Guide (ICRG) published by the Country Risk Services Inc. The political risk (PR) rating is a measure of the host country's political environment. It includes some macro-assessments like government stability, socioeconomic conditions, external and internal conflicts, corruption, law and order, military in politics, religious and ethnic tensions, democratic accountability and bureaucracy quality.

The procedure of assessing a country's ability to finance its official commercial and trade debt is represented by the financial risk (FR) rating. This measure consists of foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of exports of goods and services, net international liquidity as months of import cover and exchange rate stability.

The countries' current economic strengths and weaknesses are measured by the economic risk (ER) rating. The ER accounts for the macro-assessments of GDP per capita and the real GDP growth, annual inflation rate, budget balance as a percentage of GDP and current account as a percentage of GDP. Based on this monthly-based quantitative ranking, the composite risk uses a scale from 0 to 100 to measure a

country's creditworthiness where 100 score represents the maximum creditworthiness. The composed rating is calculated by 50% contribution of the political risk rating, while economic and financial risk ratings each contribute 25%. A higher value of the index indicates lower risk. The equity market volatility index (VIX index) published by the Chicago Board Options Exchange (CBOE) is commonly employed to measure the stock market's expectation of volatility as implied by S&P 500 index. The VIX index, known as the fear gauge, is obtained from yahoo finance. The stock price indices for each country are obtained from the Thomson Financials DataStream data bank.

4.1.1 Descriptive Statistics

Table 1 presents the descriptive statistics for the stock return series. The average monthly returns of markets are positive except Saudi Arabia and Jordan and much larger than the average world return of 0.297%. Based on these unconditional mean values, the highest return market is Tunisia with a value of 1.01% followed by Egypt with 0.787%. For Saudi Arabia and Jordan, investors on the average can expect a loss of 0.03% and 0.164% per month respectively. The standard deviations of the index returns indicate that the markets are much riskier than the world market globally except the market for Morocco and the lowest risky Tunisian market. Based on the unconditional standard deviations, the riskiest market is observed to be the Egyptian market.

However, skewness measure is negative in all markets except Morocco meaning that probability of negative returns is higher than positive returns. The skewness, excess kurtosis and the Jarque-Berra statistics confirm unconditional distribution of returns have fat tails. The Ljung-Box Q-statistics of raw returns, $Q(10)$, and their squares, $Q^2(10)$, at lag 10 indicate the presence of autocorrelations for Jordan, Turkey and the

world index and significant correlations in their second moments in all the series except for Tunisia. The significant ARCH test statistics at lag 10, except for Tunisia and Egypt, are consistent with $Q^2(10)$ statistics which may be due to either volatility clustering or regime shifts over the sample period.

Table 1: Descriptive statistics on monthly return series (January 2005-December 2018)

Country	Mean	SD	SK	EK	JB	Q (10)	Q ² (10)	ARCH (10)
Jordan	-0.16	5.16	-0.081	4.48***	76.1***	17.860* [0.0574]	32.99*** [0.003]	3.2311*** [0.09]
Turkey	0.722	7.53	-0.40***	0.832	5.183 *	21.6 ** (0.0427)	58.6 *** (0.0000)	5.11 *** (0.0000)
Egypt	0.787	9.38	-0.39***	2.08***	21.7***	14.54 [0.1496]	8.60 [0.5700]	0.826 [0.6041]
Morocco	0.462	4.18	0.219***	2.39***	29.9***	8.80 [0.5507]	33.40*** [0.002]	2.77** [0.037]
Saudi Arabia	-0.03	7.67	-0.75***	1.66***	14.668***	9.60 [0.4767]	47.32*** [0.000]	3.51** [0.004]
Tunisia	1.01	3.70	-0.46**	1.74***	15.92 ***	10.21 [0.4220]	13.80 [0.1825]	1.19 [0.3010]
World Index	0.297	4.33	-1.13*	3.48***	27.1***	18.90** [0.0415]	51.18*** [0.0000]	4.34** [0.0000]

Notes; M, Std. D, Skew, and Ex. Kur. denote the mean, standard deviation, skewness, and excess kurtosis, respectively. JB refers to Jarque-Bera statistics. Q (10) refers to Ljung-Box Q-measures at lag 10 for rare returns, whereas Q² (10) refers to Ljung-Box Q-measures of raw squared returns at lag 10; ***, **, and * denote the significance of coefficients at 1%, 5%, and 10%, respectively Numbers in parentheses are *p*-values.

Table 2 presents the descriptive statistics for the risk data. Based on the CR ratings, the riskiest market is Egypt. Based on the sub-risk ratings, political rating is the lowest in Egypt (riskiest) while Turkey is the highest risk country according to the financial-risk rating (33.8) followed by Tunisia (36.1). In general, all countries have rather low financial risk ratings, with the highest rating of 46 for Saudi Arabia. The economic risk ratings range between 32.0 and 35.5 except for Saudi Arabia (44.5) indicating these markets also have rather risky economic environment. The negative average changes in the CR ratings imply that all countries are becoming riskier over the sample period. Considering the sub-risk ratings, while the monthly average changes for FR and ER ratings are negative for all countries, except Turkey, the PR are negative for all markets except for Saudi Arabia. In general, the descriptive statistics suggest these markets are risky but yield higher returns compared to world markets.

Table 3 presents the unit root tests for the variables at the levels and the first differences using the ADF and the KPSS tests. The results indicate that all the series at first difference do not contain unit root and become stationary.

Table 2: Descriptive Statistics on Monthly Risk Rating Data

Country	<u>PR Rating</u> Avg.			<u>FR Rating</u> Avg.			<u>ER Rating</u> Avg.			<u>CR Rating</u> Avg.		
	Mean	SD	Change	Mean	SD	Change	Mean	SD	Change	Mean	SD	Change
Jordan	65.7	5.47	-0.0	39.6	2.27	-	32.3	4.32	-	57.3	8.28	-0.6
				0.00			0.2					
Turkey	57.6	5.34	-	33.8	2.41	-	34.4	1.43	-	52.1	8.27	-0.0
	0.083			0.009			0.02					
Egypt	55.3	5.31	-	39.4	3.86	-	35.5	2.88	-	51.1	8.31	-0.03
	0.018			0.006			0.02					
Morocco	68.5	2.80	-	38.8	3.51	-	33.7	2.39	-	58.5	7.97	-0.04
	0.003			0.047			0.01					
S. Arabia	65.8	4.62	-	45.9	2.22	-	44.5	5.43	-	62.5	8.21	-0.00
	0.044			0.017			0.01					
Tunisia	66.9	5.08	-0.05	36.1	2.00	-	32.6	2.99	-	56.6	7.88	-0.06
				0.02			0.03					

Source: International Country Risk Guide. Note: Calculation performed by the author.

Table 3: Unit root test results of the variables

JORDAN								
Variable	ADF Test				KPSS TEST ^a			
	At Level	First Difference			At Level	First Difference		
t-Stats	t-critical	t-Stats	t-critical	t-Stats	t-critical	t-Stats	t-critical	t-critical
	5%	5%	5%		5%	5%	5%	5%
LJD-TB								
Intercept	-2.01	-3.34	-1.23	-3.21	-5.09	-4.23	-2.33***	-2.10
Intercept &Trend	-4.491	-3.750	-9.93***	-4.812	-12.23	-4.094	-3.49***	-6.98
CRJD								
Intercept	-4.45	-5.09	-2.10	-3.40	-5.23	-1.12	-3.09***	-13.10
Intercept &Trend	-5.265	-3.000	-	-6.600	-8.903	-3.45	-11.97***	-4.80
			12.615***					
PJD								
Intercept	-4.50	-3.44	-3.21***	-1.20	-3.89	-5.22	-7.23***	-13.20
Intercept & Trend	-2.09	-3.00	-9.934***	-5.812	-8.450	-2.20	-4.979***	-11.90
TURKEY								
Variable	ADF Test				KPSS TEST ^a			
	At Level	First Difference			At Level	First Difference		
t-Stats	t-critical	t-Stats	t-critical	t-Stats	t-critical	t-Stats	t-critical	t-critical
	5%	5%	5%		5%	5%	5%	5%
LTR-TB								
Intercept	-4.12	-4.30	3.66***	-1.09	-11.54	-7.09	-8.65***	-15.54
Intercept & Trend	-2.03	-12.74	9.950***	-2.54	-10.998	-5.444	-12.19***	-18.00

CRTR								
Intercept	-5.80	-3.56	-8.87***	-6.09	-12.23	-4.90	-6.23***	-20.90
Intercept & Trend	-4.549*	-6.06	-12.31***	-1.909	-13.00	-2.005	-16.320***	-40.05

PTR								
Intercept	-7.34	-4.98	-9.30***	-5.03	-7.60	-4.10	-9.40***	-19.20
Intercept & Trend	-3.67*	-1.234	-12.61***	-3.345	-18.023	-2.109	-12.84***	-22.600

EGYPT								
ADF Test					KPSS TEST ^a			
Variable	At Level		At First Difference		At Level		At First Difference	
	t-Stats	t-critical 5%	t-Stats	t-critical 5%	t-Stats	t-critical 5%	t-Stats	t-critical 5%
LEG-TB								
Intercept	-8.23	-6.20	-15.76***	-3.20	-9.29	-2.20	-6.67***	-5.87
Intercept & Trend	-6.781	-2.13	-18.79***	-7.043	-11.429	-1.23	-10.070***	-7.139
CREG								
Intercept	-5.30	-2.90	-9.70***	-3.50	-10.23	-6.20	-4.30***	-8.38
Intercept & Trend	-3.400	-4.222	-14.98***	-4.156	-12.37	-10.09	-3.103***	-13.03
PEG								
Intercept	-2.33	-7.45	-9.06***	-3.29	-5.00	-6.91	-7.34***	-5.44
Intercept & Trend	-1.34*	1.098	-10.54***	-2.730	-2.0961	-2.001	-2.059***	-11.39

MOROCCO								
ADF Test					KPSS TEST ^a			
Variable	At Level		At First Difference		At Level		At First Difference	
	t-Stats	t-critical 5%	t-Stats	t-critical 5%	t-Stats	t-critical 5%	t-Stats	t-critical 5%
LMOR-TB								
Intercept	-1.23	-5.34	-2.35***	-8.35	-2.34	-14.45	-9.34***	-13.45
Intercept & Trend	-6.562	-8.023	-6.023***	-6.826	-2.465	-5.87	-7.20***	-2.76
CRMOR								
Intercept	-6.56	-9.04	-4.98***	-1.98	-4.09	-3.76	-7.53***	-12.09
Intercept & Trend	-2.365*	-9.322	-4.087***	-2.794	-2.3314	-2.7479	-6.601***	-14.23
PMOR								
Intercept	-6.12	-7.45	-9.52***	-3.76	-4.32	-2.98	-4.46***	-7.21
Intercept & Trend	-3.118	-9.230	-15.870***	-2.640	-3.0737	-2.6410	-2.240***	-12.34

SAUDI ARABIA								
ADF Test					KPSS TEST ^a			
At Level		At First Difference			At Level		At First Difference	

Variable	t-Stats	t-critical 5%	t-Stats	t-critical 5%	t-Stats	t-critical 5%	t-Stats	t-critical 5%
LSA-TB								
Intercept	-2.10	-3.09	-6.05***	-9.02	-11.96	-7.90	-10.04***	-3.08
Intercept & Trend	-5.111	-5.254	-10.325***	-0.989	-15.083	-12.214	-12.33***	-2.97
CRSA								
Intercept	-4.20	-1.87	-11.23***	-4.34	-1.34	-4.78	-8.35***	-3.756
Intercept & Trend	-2.727	-0.223	-10.325***	-3.041	-11.098	-2.7474	-2.965***	-12.87
PSA								
Intercept	-1.90	-1.05	-3.98***	-3.20	-7.05	-3.27	-7.09***	-9.54
Intercept &Trend	-1.849	-0.023	-11.312***	-1.940	-9.001	-2.250	-2.388***	-10.977

TUNISIA

Variable	ADF Test				KPSS TEST ^a			
	At Level		At First Difference		At Level		At First Differ	
	t-Stats	t-critical 5%	t-Stats	t-critical 5%	t-Stats	t-critical 5%	t-Stats	t-critical 5%
LTUN-TB								
Intercept	-5.87	-2.12	-8.45***	-5.70	-6.43	-2.96	-6.93***	-4.01
Intercept & Trend	-6.332	-6.573	-15.1***	-6.573	-12.542	-1.312	-12.7***	-15.2
CRTUN								
Intercept	-3.70	-1.60	-9.57***	-2.68	-3.19	-1.90	-7.05***	-6.8
Intercept &Trend	-2.309	-2.440	-11.1**	-2.440	-2.329	-2.385	-2.63***	-13.1
RTUN								
Intercept	-5.45	-3.90	-8.47***	-2.96	-1.07	-3.20	-5.08***	-9.0
Intercept & Trend	-2.591*	-2.321	-12.20***	-2.321	-2.4104	-2.107	-2.42**	-1.2

Variable	ADF Test				KPSS			
	At Level		First Difference		At Level		First Difference	
	t-Stats	t-critical 5%	t-Stats	t-critical 5%	t-Stats	t-critical 5%	t-Stats	t-critical 5%
LWI-TB								
Intercept	-1.42	-4.68	-3.52***	-1.65	-2.01	-7.09	-3.51***	-9.6
Intercept & Trend	-0.33	-1.227	-6.47***	-0.16	-1.35	-6.90	-3.32***	-12.4
LVIX								
Intercept	-6.23	-4.91	-6.03***	-5.50	-1.07	-3.95	-2.75***	-7.4
Intercept & Trend	-3.86	-3.789	-15.16***	-3.656	-5.26	-3.17	-1.34***	-8.2
TB								
Intercept	-1.70	-4.05	-7.30***	-5.90	-5.40	-8.71	-7.08***	-4.7
Intercept & Trend	-0.51*	-1.219	-15.72***	-1.32	-10.127	-1.065	-4.062***	-12

LWI								
Intercept	-5.10	-3.20	-5.09***	-4.76	-9.04	-3.49	-8.03***	-8.5-
Intercept & Trend	-2.14*	-1.450	-1.15***	-2.253	-6.173	-1.547	-3.49***	10.7
OP								
Intercept	-5.08	-4.39	-2.67***	-8.62	-15.40	-	-13.45***	-11.18
Intercept & Trend	-6.15	-7.48	-9.25***	-1.89	-13.53	5.87	-17.42***	-12.43
						-2.10		

Notes: The table reports the results of the augmented Dickey–Fuller (ADF) and Kwiatkowski–Phillips–Schmidt–Shin (KPSS) unit root tests. The ADF test contains constant and trend. The null hypothesis for the ADF test was that the series was nonstationary, whereas it was stationary for the KPSS test. The optimal lag length for the ADF test was selected based on the Schwarz information criterion (SIC); the bandwidth for KPSS tests was selected with Newey–West estimator using the Bartlett kernel. ^a The asymptotic critical values of KPSS assessment without the trend model were 0.739, 0.463, and 0.347 at 1%, 5%, and 10%, respectively. ^b The asymptotic critical values of KPSS assessment with the trend model were 0.216, 0.146, and 0.119 at 1%, 5%, and 10%, respectively. ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

The correlation matrix in Table 4 presents the correlations of the stock returns with the world index returns and within themselves. Tunisia has the lowest correlation with the world index (0.06%) while Egypt has the highest correlation of 0.54% followed by Saudi Arabia with 0.40%. However, all stock returns have lower correlations with each other; the maximum correlation between Egypt and Saudi Arabia which is about 0.44% followed by Jordan with Egypt and Saudi Arabia with a correlation of about 0.36%.

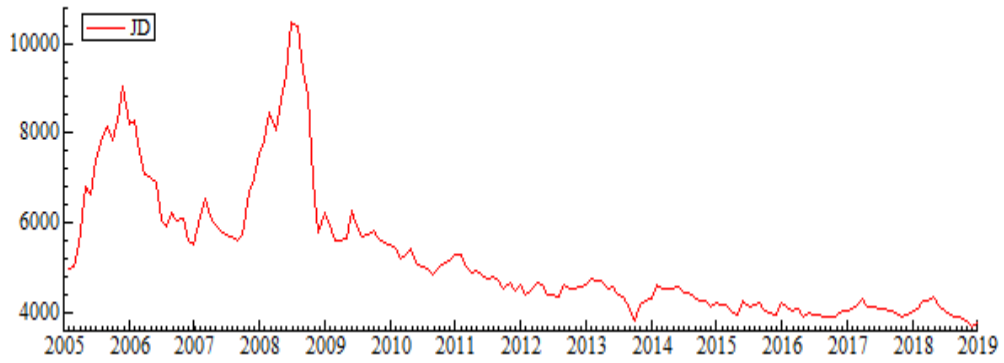
Table 4: Correlation matrix between stock returns

	DLJD	DLTR	DLEG	DLMOR	DLSA	DLTUN	DLWI
DLJD	1.0000	0.0707	0.36810	0.12485	0.36396	0.19772	0.29473
DLTR		1.0000	0.21825	0.052974	0.20640	-0.1021	0.23392
DLEG			1.0000	0.31558	0.44216	0.15452	0.54446
DLMOR				1.0000	0.14987	0.12838	0.19364
DLSA					1.0000	0.13665	0.39958

DLTUN						1.0000	0.060420
DLWI							1.0000

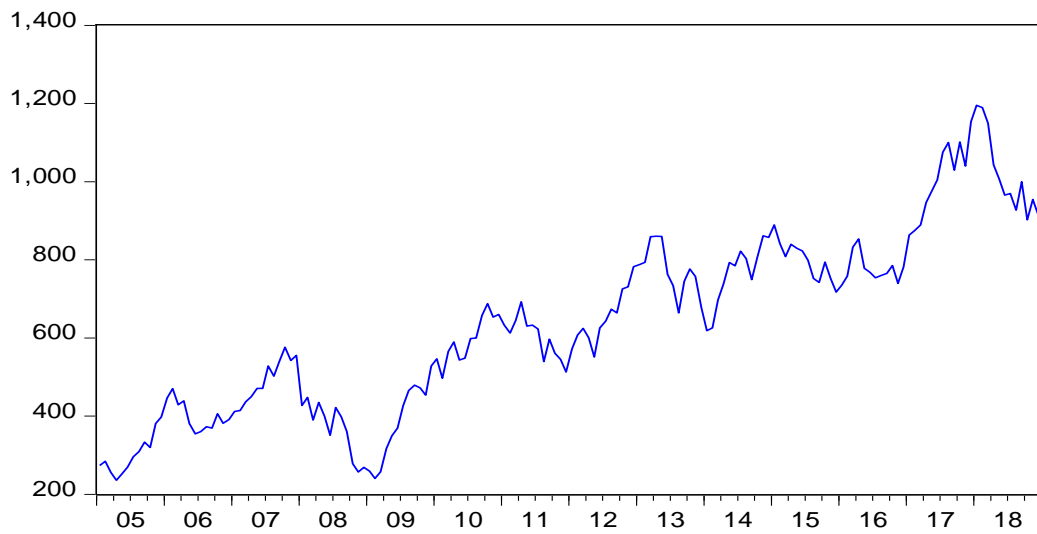
Appendix 1 shows correlations between all the explanatory variables in the models. The table shows that there is a positive relationship between excess returns of the stock markets of all the sampled countries. However, the relationship between the excess returns of economies were stronger between Morocco and Jordan, Saudi Arabia and Jordan, Jordan and Tunisia, Morocco and Saudi Arabia, Tunisia and Saudi Arabia, Tunisia and Morocco excess returns respectively. The excess returns of Jordan, Morocco, Saudi Arabia and Tunisia with the world index appear to be relatively stronger than the other countries' excess returns. Considering the correlation between excess returns of each country with its and country risk, we also observe positive relationship among them. The relationship however is strong for excess returns of Saudi Arabia and Morocco. However, the table presents a negative relationship between returns to market and Brent crude oil price index and VIX index. Also Appendix 1 indicate that with the exception of excess returns of Saudi Arabia and Turkey which have a weak positive relationship with the Brent Crude oil Price (Spot price) Index, excess returns of all the other countries show negative correlation. Composite risk of all the countries have a strong negative relationship with the Brent crude oil price (Spot price) index showing that oil price increases the country risk (lowers). In addition, the correlations between the VIX index and excess returns of all the sampled countries are positive except Turkey which shows a weak negative relationship. On the other hand, the result show a negative relationship between the VIX Index and composite risk of Morocco, Tunisia and Jordan implying that negative

perceptions about the world market is associated with worsening of the composite risk of these two countries.

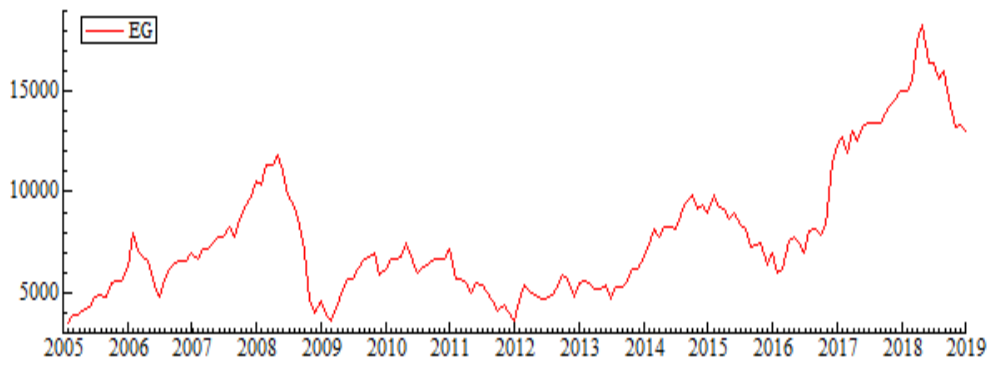


Jordan

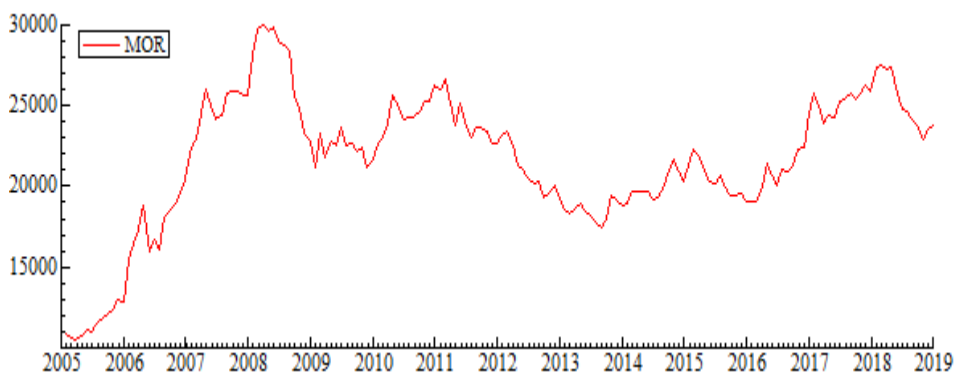
TR (\$)



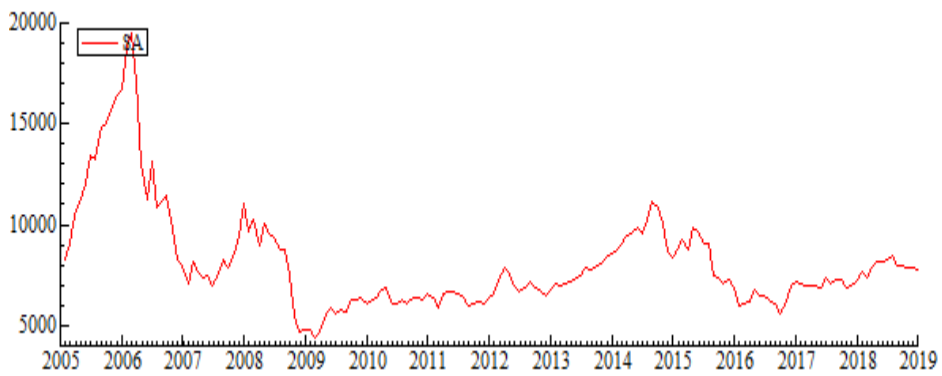
Turkey



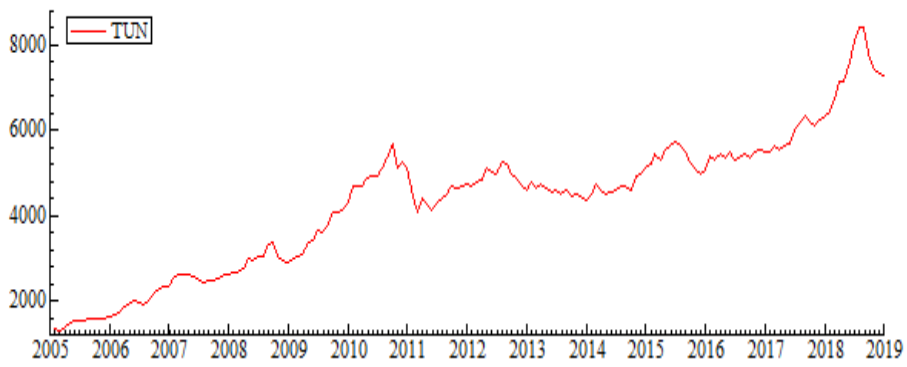
Egypt



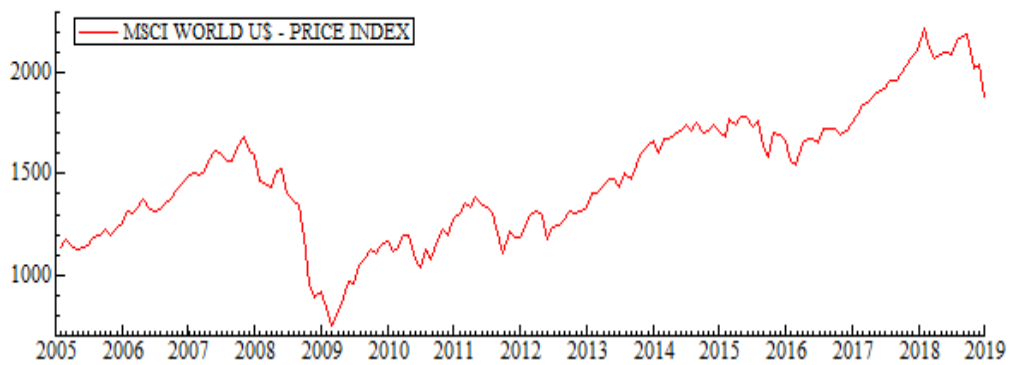
Morocco



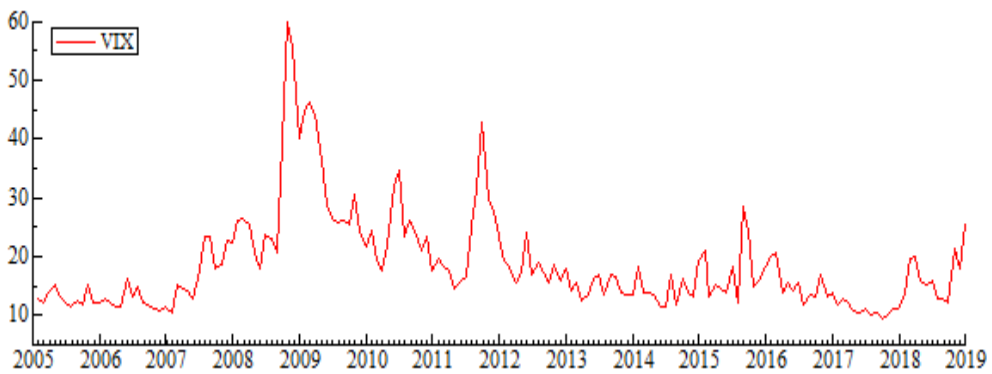
Saudi Arabia



Tunisia



World Pirce Index



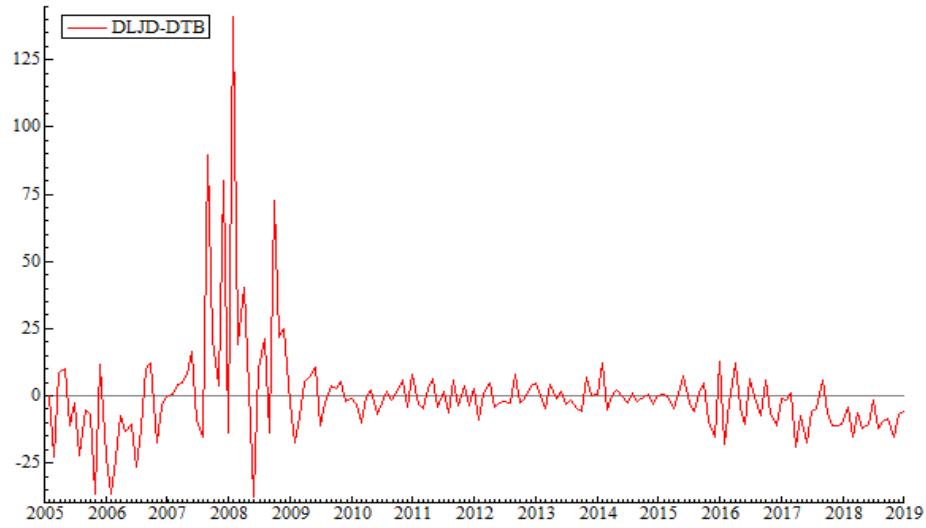
VIX Index based on S&P 500 Index

Figure 1: Time series graphs of the stock prices of countries, World, VIX indices and the Brent Oil Price for January 2005–December 2018.

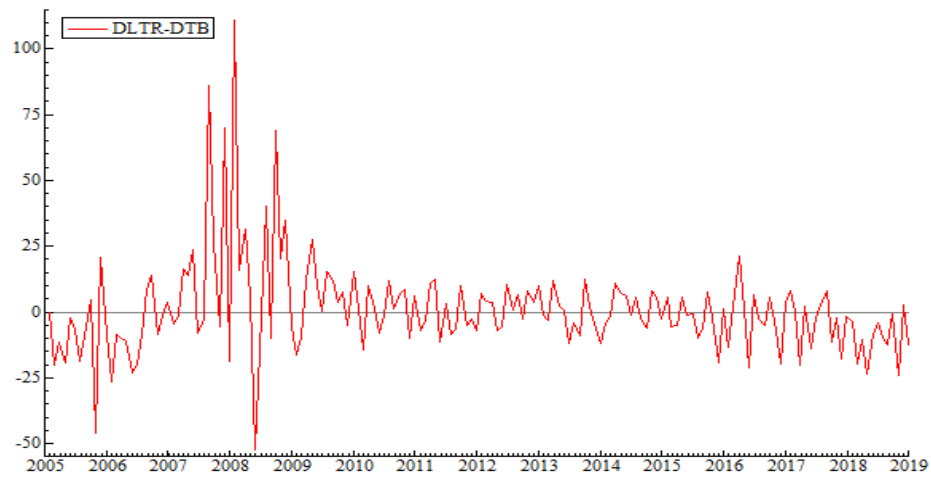
Figure 1 displays the graphs of the level data. As expected, the World index, as well as the stock price indices of other markets exhibit sharp falls during 2009, the global financial crisis, except Tunisia, while the VIX index jumps up during the same period reflecting the negative perceptions of investors about the markets. The Tunisian financial market shows a small decline during 2009. The substantial fall in the Saudi stock exchange at the beginning of 2006 which affected other countries in the region is also clearly visible in Jordan and Egypt stock markets at the beginning of 2006. Considering the return series, high volatilities are observed for all the series especially between 2008 and 2010.

Figure 1 also shows that the World price index exhibited a sharp fall in 2009, the Global financial crises and the VIX index which increased sharply in 2009 showing the increase in negative perceptions of the markets.

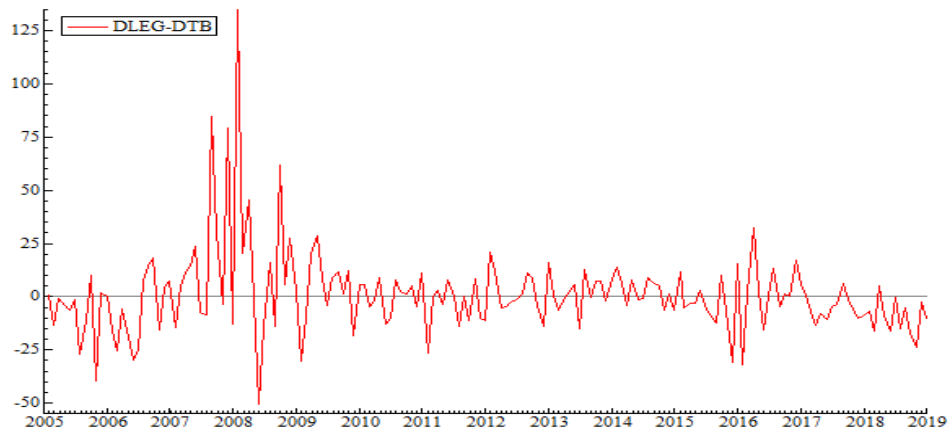
Figure 2 shows the excess stock price return series of all the sampled countries, the world index and the crude oil price. All the stock return series exhibited sharp increase during the global financial crises 2008-2009 while the oil price changes have a sharp decline during the same period.



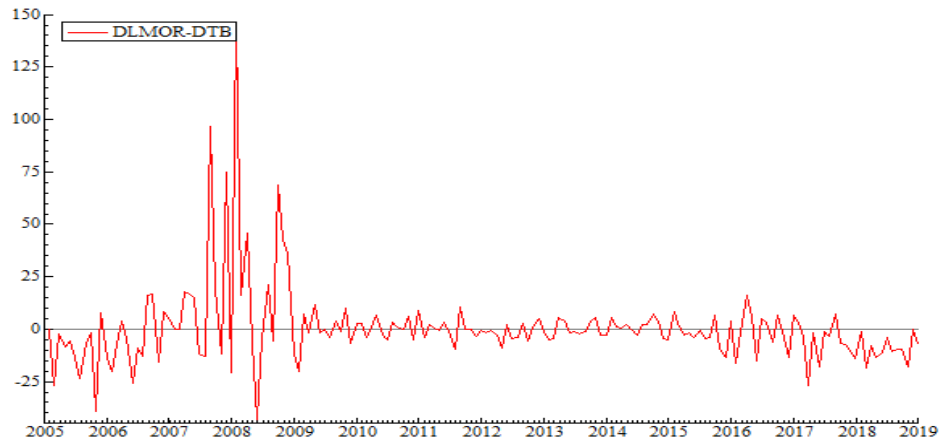
Jordan



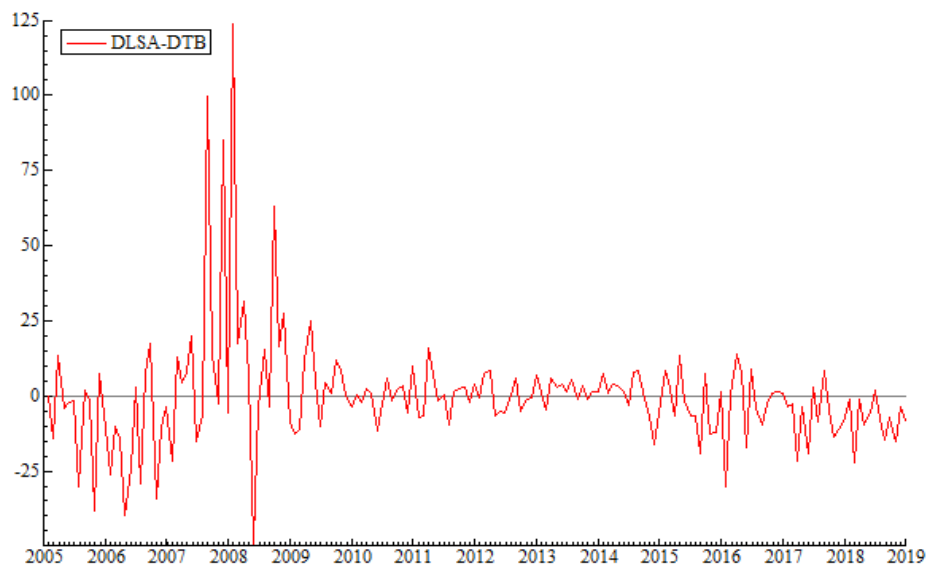
Turkey



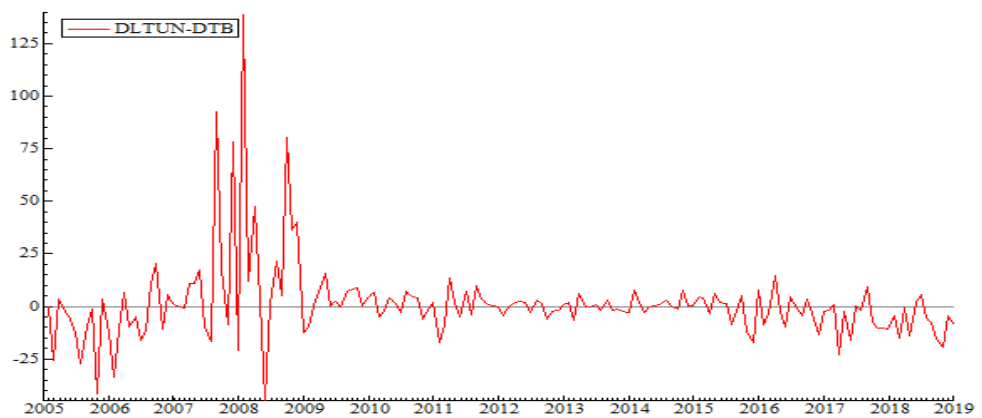
Egypt



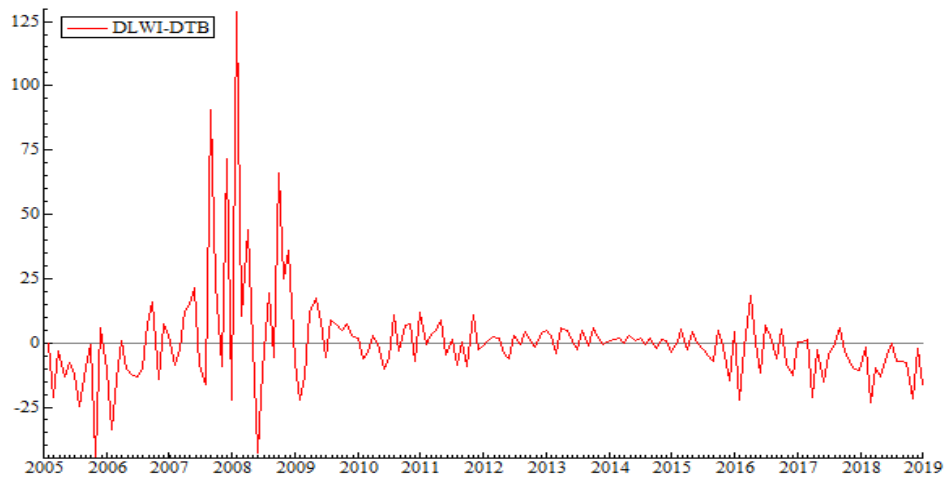
Morocco



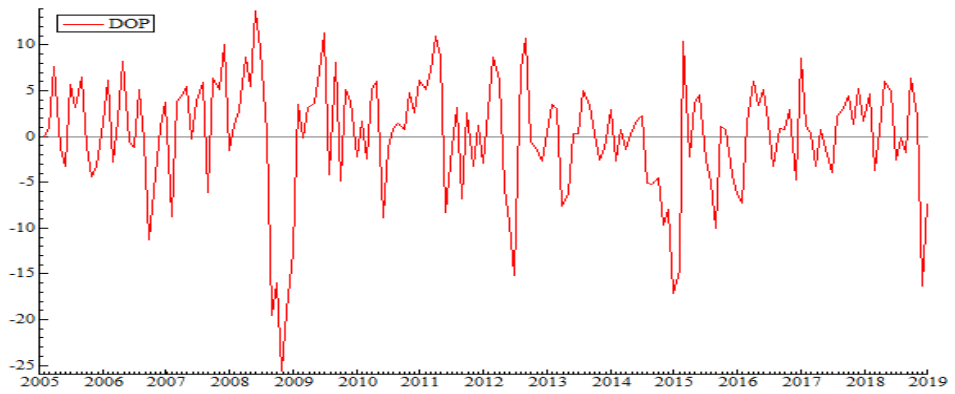
Saudi Arabia



Tunisia



World Price Index



Brent Oil Price Changes

Figure 2: Stock price excess returns and Brent oil price changes: January 2005 - December 2018.

4.2 Methodology and Empirical Models

The ICAPM developed originally by Merton (1973) is a linear model based on the CAPM initially introduced by Sharpe (1964) and Lintner (1965). However, the feature of our sample which includes both the volatile and tranquil periods dictates that a linear model will not be realistic. The linear ICAPM can be expressed as:

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \varepsilon_{it} \quad (1)$$

where $i = 1, 2 \dots n$, $t = 1, 2 \dots T$ and $\varepsilon_{it} \sim iid N(0, \sigma^2)$. In equation (1) R_{it} represents the index return of country i , where R_{mt} is the world index return as a proxy for the market return while R_{ft} stands for risk free return. Equation (1) can compactly be written as

$$\text{Model (1)} \quad r_{it} = \alpha_t + \beta_t r_{mt} + \varepsilon_{it} \quad (2)$$

where $r_{it} = R_{it} - R_{ft}$ and $r_{mt} = R_{mt} - R_{ft}$ denote excess returns on country i and world portfolio respectively. In order to formally set up the appropriate model, first we estimated a linear model (model 1) and then the Markov-switching model (model 2) to see if actually the parameters were regime-dependent.³ The objective of a regime-switching model is to allow for different behaviors in different states of the economy. A simple regime-switching model can be expressed as follows:

$$\text{Model(2)} \quad r_{it} = \alpha_{S_t} + \beta_{S_t} r_{mt} + \varepsilon_{it} \text{ where } \varepsilon_{it} \sim N(0, \sigma_{S_t}^2). \quad (3)$$

where the unobserved state variable, S_t , evolves according to the first order Markov-switching process described in Korkmaz (2010). Parallel to the finance theory, we

³ The estimates of the linear model are not reported to save space but are available on request.

estimate a two-regime model of stable and unstable financial markets in which S_t is defined as

$$S_t = 0, 1 \begin{cases} \text{if } S_t = 0 \\ \text{if } S_t = 1 \end{cases} \quad (4)$$

The recession regime will be determined by the higher volatility regime. For instance, if $\sigma(1) > \sigma(0)$, regime 1 will be the recession or high volatility regime and regime 0 will indicate the stable or low volatility regime. The transition probabilities in Markov-switching models can be defined as the transition probability between the S states or regimes (in our case S=2). Therefore, the probability of moving from state j in one period to state i in the next period depends on the previous state as follows;

$$P_{i|j} = P[S_{t+1} = i | S_t = j], \quad i, j = 0, \dots, S-1 \quad (5)$$

The transition matrix of probabilities for S = 2 is

$$P = \begin{pmatrix} P_{0|0} & P_{0|1} \\ P_{1|0} & P_{1|1} \end{pmatrix} \quad (6)$$

where $0 \leq P_{0|0}, P_{1|1} \leq 1$ and the conditional probabilities in each column sum to 1. For instance, let $P[S_{t+1} = 0 | S_t = 0] = p$ then $P[S_{t+1} = 1 | S_t = 0] = 1 - p$ and $P[S_{t+1} = 1 | S_t = 1] = q$ then $P[S_{t+1} = 0 | S_t = 1] = 1 - q$. The estimation procedure for the Markov-switching model is well documented in literature (Hamilton, 1989; Kim and Nelson, 1999). The general form of the ICAPM model described in equation (3) as Markov-switching dynamic regression (MS-DR) model is further extended by

incorporating another global factor, the VIX index (model 2.1). In order to include the local factors for the countries, we further extend this model by the inclusion of the composite risk (CR) rating data (model 2.2). In model (2.3), the CR is alternatively replaced by its components as economic, financial and political risk variables respectively⁴. These models are defined as follows;

$$\text{Model (2.1)} \quad r_{it} = \alpha_{st} + \beta_{st} r_{mt} + \delta_{st} \text{VIX} + \varepsilon_{it} \quad (7)$$

$$\text{Model (2.2)} \quad r_{it} = \alpha_t + \beta_t r_{mt} + \gamma c_t CR_{it} + \gamma o_t Oil_{it} + \delta_{st} \text{VIX} + \varepsilon_{it}. \quad (8)$$

$$\text{Model (2.2.1)} \quad r_{it} = \alpha_{st} + \beta_{st} r_{mt} + \gamma c_{st} CR_{it} + \gamma o_t Oil_{it} + \delta_{st} \text{VIX} + \varepsilon_{it} \quad (9)$$

where $\varepsilon_{it} \sim iid N(0, \sigma^2)$ and CR_{it} is the composite, PR is the political, ER is the economic and FR is the financial risk ratings for each country. For each market, model (2.3) is estimated up to two lags of the explanatory variables and the best model is selected based on the log-likelihood value.

⁴ As the political, financial and economic risk ratings may be highly correlated, they are included into the models alternatively. However, the interpretation of the estimated beta coefficients should be taken with care as omitted variable bias may have resulted in equations (10-12)

Chapter 5

EMPIRICAL RESULTS

First, we estimated a linear ICAPM with a single state and fixed variance. This allowed us to compare the estimates from the single-state model with the two-state model as a means of checking for the model specifications: based on the diagnostic tests, if the single-state model with a fixed sigma value is adequate, there will be no need to estimate the Markov-switching model with two states, and one can decide that there are no regime changes, verifying the adequacy of the single-state model. The single-state model with fixed variance is presented in Table 5 at no lag (Model 2.2).

In the literature, it has been documented that the local factors represented by the composite risk ratings composed of the political, economic and financial risks have more power in predicting the expected returns in the emerging markets (Hassan et al., 2003). Based on the theoretical finance literature, any factor that affects the expected cash flows will be transmitted to the stock prices: an increase in oil price which will lead to higher cost of production, lower profits and the stock prices. In this context, we extended model (2.1) in equation (7) by adding the general composite country risk factor (CR), the oil price changes and the VIX index as a control variable in order to correctly measure the systematic risk. Table 5 presents the estimates for model (2.2) the linear, single-state, ICAPM model with the composite risk (CR) ratings, oil price changes (Oil) and the VIX index with fixed variance at no lag. The risk premium, beta, is highly significant in all the sampled financial markets and very close to one or even greater than one in the case of Morocco and Tunisia. The positive and highly

significant CR rating in Jordan indicates that as the country becomes less risky, in general, the investment in this market yields higher excess returns which poses questions on the reliability of the estimates. The diagnostic tests for the Jordanian market with highly significant Q and Q^2 and the ARCH test statistics at all lags suggest inadequate modelling. Similar results are observed for the other countries except Egypt. In addition, estimates with inclusion of lagged values have not shown any improvement in the diagnostic tests. The significant Q , Q^2 and the ARCH test statistics may be the result of changing states of the markets rather than the correlations in scaled residuals and squared scaled residuals.

Table 5: Estimates of ICAPM with Composite Risk Rating (No lag)

Country	Jordan	Turkey	Egypt	Morocco	Saudi Arabia	Tunisia
α_t	-0.5044 [0.202]	0.4478 [0.346]	0.4544 [0.455]	0.1122 [0.765]	-0.3802 [0.494]	0.6872 [0.059]
β_t	0.9816*** [0.000]	0.941*** [0.0000]	0.9901*** [0.000]	1.023*** [0.000]	0.9576 *** [0.000]	1.0050*** [0.000]
γc_t	0.1203*** [0.000]	0.1130 [0.636]	-0.3859 [0.201]	-0.2686 [0.132]	0.2404 [0.237]	0.1415 [0.461]
γo_t	0.0226 (0.616)	-0.0215 [0.692]	0.0714 [0.305]	-0.0856** [0.047]	0.1029 [0.104]	-0.1008** (0.016)
δ_t	0.1010 [0.592]	0.0201 [0.381]	0.0192 [0.516]	0.1027*** [0.000]	0.0621 ** [0.022]	0.1298*** [0.000]
sigma	5.0834 (0.2782)	6.0914 (0.3343)	7.8397 (0.4290)	4.8444 (0.2651)	7.1338 [0.3915]	4.6609 (0.2550)
Log-likelihood	-508.50	-535.49	-580.85	-500.46	-561.71	-494.01
$Q(5)$	13.240** [0.0212]	8.3156 [0.1397]	4.7732 [0.4442]	11.067 [0.0501]	0.857 [0.9733]	7.4602 [0.1886]
$Q^2(5)$	11.772** [0.0381]	5.1650 [0.3961]	2.2413 [0.8148]	27.769*** [0.0000]	58.485 *** [0.0000]	21.944*** [0.0005]
$Q(10)$	16.597* [0.0838]	20.62 ** [0.0239]	7.7462 [0.6536]	11.596 [0.3130]	6.196 [0.7980]	12.637 [0.2447]
$Q^2(10)$	25.706** [0.0042]	9.2017 [0.5131]	6.5409 [0.7680]	29.318*** [0.0011]	74.065 *** [0.0000]	23.223** [0.0100]

ARCH (1-5) test	3.0073** [0.0129]	0.9584 [0.4454]	0.41831 [0.8355]	4.1190** [0.0016]	8.8861 *** [0.0000]	3.8487 [0.0026]**
ARCH (1-10) test	3.1655 [0.0011]**	1.09731 [0.3684]	0.69315 [0.7296]	.2954** [0.0158]	4.7651 *** [0.0000]	1.8891 [0.0513]

Note: ***, ** and * denote coefficient is significant at 1%, 5%, 10%, respectively; values in () are standard errors and [] for the p-values.

Table 6 presents the estimates of MS- ICAPM (model 2.2.1 in eq.9) for two states which is extended by one period lagged values of the regressors. The lag length is based on the Akaike Information Criteria (AIC). The selection of the reported estimated models is based on the log-likelihood values, diagnostic test statistics and strong convergence of the models. After the initial estimations, random search with random starting values is employed to avoid local optima.

The likelihood-ratio (LR) linearity test statistics using Anastasiou and Reinert (2020) p-values strongly rejects null of the linearity for all the estimated models. The portmanteau test statistics at lags 5 and 10 indicate the absence of correlations in the scaled residuals and the squared residuals except Tunisia. In addition, the ARCH tests at the alternative lags of 5 and 10 indicates the absence of ARCH effects in the residuals. The estimates of the volatility parameters (σ) for regime zero and one are quite different for all the countries except Morocco, however, the test of linearity also rejects the null of linear model, which support the two-state Markov-switching models for all countries. The highest increase in volatility of excess returns in high volatility relative to the stable state is observed in Turkey (3.7) followed by Egypt (3.0) and Jordan (2.4) than respectively. Morocco and Tunisia are the least risky countries with the ratio of σ being slightly over 1.

The estimates of the beta parameters are time-varying conditional on the state of the economy. In addition, the estimates of the systematic risk are highly significant in all the regimes for all the countries at current time period. This implies that there is a relationship between these countries' market index and the world index confirming that the global factors are important determinants of excess returns for these markets. Furthermore, the estimated excess returns are about the same as that of the world market returns for Jordan and Saudi Arabia in high volatility state and slightly greater than 1 for Tunisia in low volatility regime. Morocco and Tunisia are the markets that yield higher excess returns than the world market in stable regime. The coefficients for the constant (alpha) are not statistically significant for Morocco and Saudi Arabia in both regimes indicating that the ICAPM is not efficient in these markets in any of the regimes.

The country risk factor significantly affects the excess returns in Egyptian market during both the high risk and the tranquil regimes, however with opposite directions depending on the state of the market: during the high risky regime, as the country becomes more risky, the excess returns become higher with a large coefficient of 1.26. However, during the stable regime, the relationship is reversed as the country becomes less risky, excess returns are higher but with a lower impact. The country risk factor has also a one period positive time effect on excess returns during the high volatility regime which implies that as the Egypt becomes less risky as a country, the excess returns become higher in the next period. A similar pattern of negative and significant impact of CR factor on excess returns is observed for Morocco, however, during the low volatility state. The country risk factor also has a marginally significant lagged effect in Morocco, during the stable state resulting in higher returns as the market becomes riskier.

In Tunisia, the CR rating is highly significant and positive with a high coefficient during the high volatility regime at no lag: as country becomes less risky in the current month, excess returns become much higher with a high coefficient. During the high volatility state, the beta coefficient is very low after capturing the country risk factor, however, Tunisia has about 2.7% higher excess returns than the world market in the stable state of the economy when the CR factor has no impact on the excess returns. In the case of Turkey, the country risk factor becomes important during the high volatility regime with a positive impact: excess returns are higher when the country becomes less risky during the unstable state which has an opposite impact with a time lag during the same state. The CR factor has no impact on the returns in Jordan and Saudi Arabia which are relatively more stable than the other countries. The signs of the estimated coefficients of the CR rating are mixed and may require a further analysis in more detail.

The stock returns of four countries show sensitivity to the oil price risk exposure: Saudi Arabia, Tunisia Egypt and Turkey. Saudi Arabia is affected positively during the stable state: the increase in oil price results in increase in excess returns of Saudi Arabia in the stable state of its market. This result implies that increase in the oil price has a positive impact on the excess returns of stocks of SA in the stable regime, which has no impact in the high volatility state of the markets. As Saudi Arabia is a net exporter of oil, positive impact is expected, however is dependent on the state of the market. Egyptian stock returns respond positively to increasing oil price during the tranquil state. Tunisia, a net oil importer since 1993, is observed to have negative impact of oil price increase on its excess returns at the current time in the stable regime with a one period time effect in the high volatility regime. Turkey, heavily dependent on oil import is also negatively affected from higher oil prices with a lag during the low

volatility regime. Jordan which produces oil and gas (Jordan Petroleum Refinery Company) is not affected from oil price movements. Oil exposure has no impact on the excess returns of Morocco, although Morocco production of oil, gas refined petroleum is limited as reported by the United States Energy Information Administration (USEIA).

The estimates of delta confirm the importance of investors' perceptions on excess returns in both the stable and high volatility regimes for all countries, except Saudi Arabia and Egypt. The positive coefficients of the VIX index suggest that as perception of the economic units about the financial markets become worse the excess returns increase. For Turkey, worsening financial perception leads to lower excess returns during the stable state. In general, the regimes are highly persistent in all the countries except for Turkey, where the probability of staying in the high volatility regime is 93.2.8%, however, this probability is 78.8.% for stable regime. Regarding the diagnostic tests, the LR statistics based on the Davies (1987) approximate upper bound for the p-values confirm the adequacy of the nonlinear model as expected for all the countries. The Q2 values at lag 5 and 10 and the ARCH tests support the adequacy of the estimated models that suggest time-varying risk premium conditional on the state of the financial markets.

Table 6: Estimates of MS-ICAPM with Composite Risk Rating, Brent Crude Oil Price

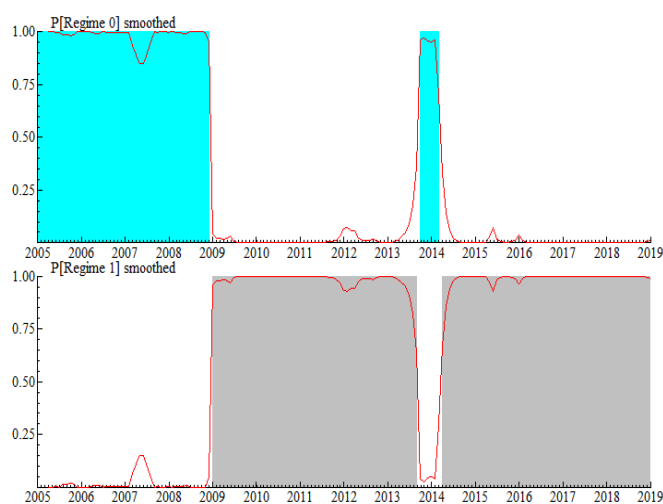
Country	Jordan	Turkey	Egypt	Morocco	Saudi Arabia	Tunisia
$\alpha_{st}(0)$	0.5131 [0.634]	2.4898 *** [0.000]	0.1408 [0.863]	0.7379 [0.089]	-5.2601 [0.112]	0.9377** [0.011]
$\alpha_{st}(1)$	-1.1409*** [0.000]	-0.2215 [0.700]	-1.1163* [0.073]	-0.2654 [0.599]	-0.0152 [0.974]	0.8535* [0.116]
$\beta_{st}(0)$	1.0096*** [0.000]	0.9905 *** [0.000]	0.9708*** [0.000]	1.046*** [0.000]	1.0185 *** [0.000]	1.0279*** [0.000]
$\beta_{st}(1)$	0.8148*** [0.000]	0.9439 *** [0.000]	1.0380*** [0.000]	0.3968** * [0.001]	0.8795 *** [0.000]	0.4277*** [0.000]
$\beta_{st-1}(0)$	0.0167 [0.613]	-0.1275 *** [0.001]	-0.0796 [0.267]	0.0010 [0.953]	0.0952 [0.401]	-0.0086 [0.580]
$\beta_{st-1}(1)$	0.0601 [0.111]	0.0627 ** [0.030]	0.1036*** [0.000]	-0.0654 [0.470]	-0.0211 [0.695]	-0.0247 [0.742]
$\gamma_{c_{st}}(0)$	0.2314 [0.521]	-0.1404 [0.112]	-1.2631*** [0.004]	-0.700*** [0.000]	-0.4346 [0.570]	-0.0676 [0.652]
$\gamma_{c_{st}}(1)$	-0.0824 [0.621]	1.9526 ** [0.035]	0.9379*** [0.000]	0.5054 [0.056]	0.3751 * [0.071]	2.6597*** [0.000]
$\gamma_{c_{st-1}}(0)$	0.5811 [0.114]	-0.0147 [0.918]	0.8681** [0.046]	-0.3478* [0.066]	-0.4131 [0.540]	-0.0407 [0.792]
$\gamma_{c_{st-1}}(1)$	0.0008 [0.996]	-0.5961 ** [0.052]	-0.3404 [0.117]	0.2749 [0.361]	-0.1193 [0.499]	1.0299 [0.124]
$\gamma_{o_t}(0)$	-0.0141 [0.913]	0.0317 [0.520]	0.0502 [0.641]	-0.0117 [0.810]	-0.0537 [0.877]	-0.1213** [0.004]
$\gamma_{o_t}(1)$	-0.0076 [0.837]	0.0763 [0.304]	0.1976*** [0.004]	-0.0600 [0.454]	0.1797 *** [0.003]	-0.0990 [0.246]
$\gamma_{o_{t-1}}(0)$	-0.3313 [0.018]	-0.159 *** [0.002]	-0.0521 [0.592]	-0.0173 [0.709]	0.1313 [0.729]	-0.0007 [0.987]
$\gamma_{o_{t-1}}(1)$	-0.0642 [0.061]	-0.0671 [0.333]	-0.0381*** [0.504]	-0.0354 [0.670]	-0.0392 [0.478]	-0.054** [0.430]
$\delta_{st}(0)$	0.1645*** [0.002]	-0.095*** [0.000]	-0.0235 [0.540]	0.081*** [0.000]	0.2068 [0.264]	0.095*** [0.000]
$\delta_{st}(1)$	0.0944*** [0.000]	0.0601 ** [0.035]	0.1648*** [0.000]	0.0695** [0.022]	0.0687 *** [0.004]	0.118*** [0.001]
$\delta_{st-1}(0)$	-0.0595 [0.334]	0.0437 * [0.068]	-0.0177 [0.666]	0.062*** [0.007]	0.3086 * [0.077]	0.0314** [0.019]

δ_{st-1} (1)	0.0400*** [0.013]	0.0091 [0.747]	-0.1998 [0.513]	0.0309 [0.229]	0.0404 * [0.101]	0.0354 [0.313]
sigma (0)	6.79870 (0.686)	1.6425 [0.2466]	8.2854 (0.580)	3.9120 (0.2991)	10.6755 (1.544)	3.4533 (0.2550)
sigma (1)	2.823 (0.2130)	6.1283 [0.3877]	2.7656 (0.3665)	3.9249 (0.3216)	5.1066** (0.0551)	4.1028 (0.3753)
$p_{\{0 0\}}$	0.9529 (0.0363)	0.7878 [0.0831]	0.9291 (0.0373)	0.9863 (0.01354)	0.949 (0.0505)	0.9866 (0.0135)
$p_{\{1 1\}}$	0.9866 (0.0149)	0.9324 [0.0307]	0.8316 (0.071)	0.9851 (0.0146)	0.991 (0.0094)	0.9682 (0.0246)
Log-likelihood	-465.4078	-515.00	-555.275	-470.857	-533.48	-462.694
Linearity LR-test	76.615*** [0.0000]	34.681 *** [0.0000]	43.122*** [0.0000]	41.979** * [0.0000]	50.128 *** [0.0000]	50.82*** [0.0000]
ARCH 1-5 test	0.5769 [0.7176]	0.5907 [0.7071]	0.74139 [0.5938]	0.5479 [0.7396]	0.7262 [0.6049]	2.3415** [0.0449]
ARCH 1-10 test	0.9727 [0.4706]	0.5186 [0.8745]	0.87125 [0.5620]	0.99161 [0.4544]	0.6964 [0.7263]	1.3650 [0.2042]

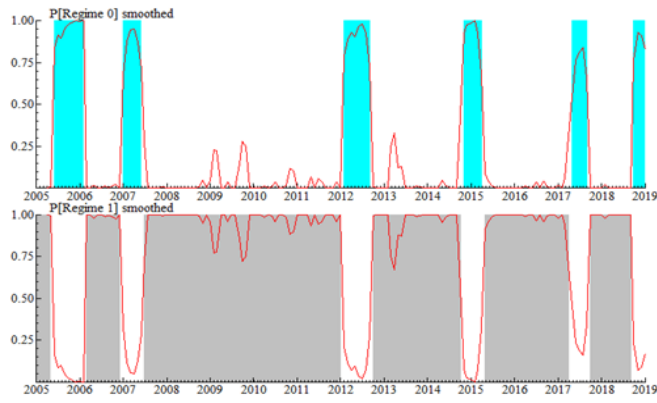
$Q(5)$	4.887 [0.4299]	4.4731 [0.4835]	3.5634 [0.6138]	7.6241 [0.1782]	1.7378 [0.8841]	10.398 [0.6784]
$Q^2(5)$	3.7461 [0.5865]	3.7366 [0.5879]	3.7091 [0.5920]	3.1399 [0.6784]	4.5836 [0.4688]	14.449** [0.0130]
$Q(10)$	9.4621 [0.4889]	7.7234 [0.2248]	8.2564 [0.6038]	13.012 [0.2230]	9.0046 [0.8359]	17.990** [0.051]
$Q^2(10)$	13.432 [0.2005]	7.7234 [0.6558]	6.6784 [0.7554]	12.798 [0.2352]	9.0046 [0.9520]	17.829* [0.058]

Note: ***, **, and * denote coefficient is significant at 1%, 5%, and 10%, respectively; values in () are standard errors, and [] for the p-value

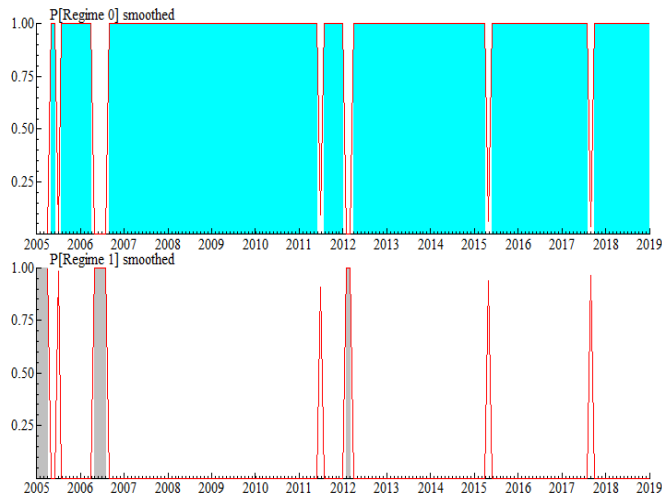
Figure 3 show the smoothed transition probabilities derived from the estimated models on Table 6. The graphs of the smoothed transition probabilities indicate the estimated models well capture the regime changes for all countries. For Jordan, regime zero is the high volatility regime were prevalent from 2005 to 2019 and in 2014. Turkey exhibits frequent regime changes over the sample period, with regime zero indicating the high volatility regime. For Egypt, regime zero is the high regime zero which has a high probability of staying in high regime which is reflected on the graph. For Morocco and Tunisia, regime one is the high regime while for Saudi Arabia, regime zero is the high volatility regime. Saudi Arabia is observed to be the most stable country among all the sample countries. The Saudi market experiences high volatility between 2006 and 2008. The other two countries, Morocco and Tunisia also experience distress in their markets between 2009 and 2014, that reflects the global financial crises period and the repercussions of the crisis afterword.



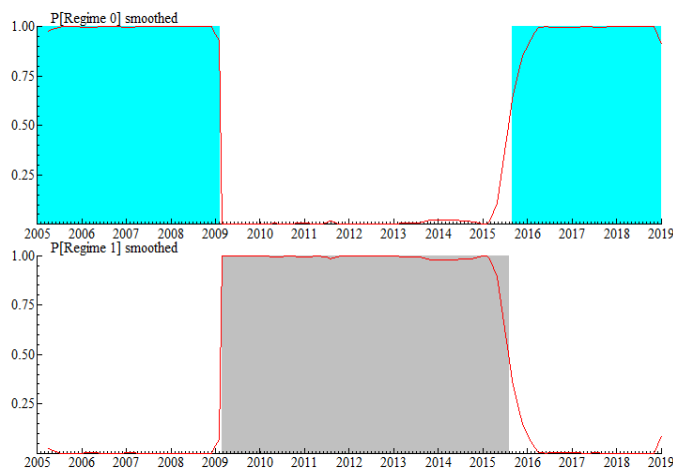
Jordan



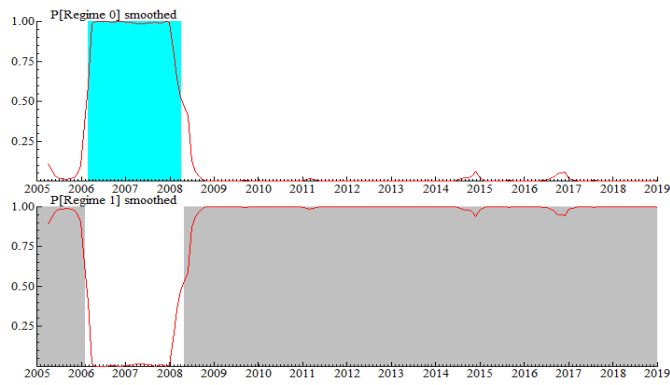
Turkey



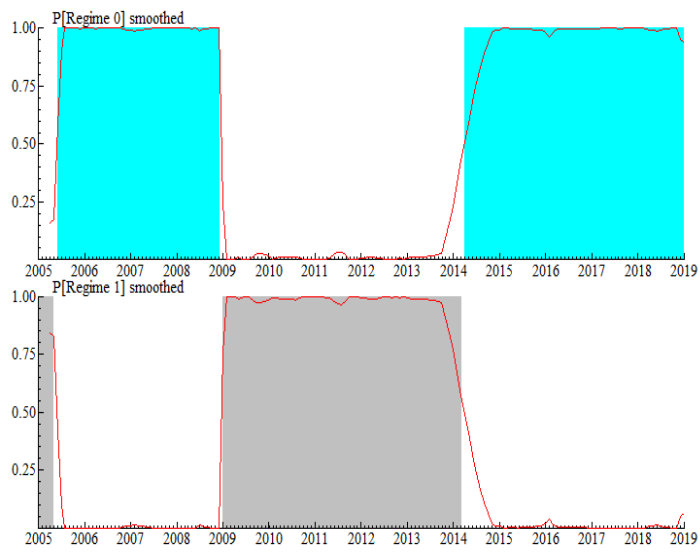
Egypt



Morocco



Saudi Arabia



Tunisia

Figure 3: Shows the smoothed transition probabilities which captures the regime changes.

Chapter 6

CONCLUSION AND RECOMMENDATION

In this study, we explore the factors that determine the excess returns within the MS-ICAPM framework for the stock markets of Jordan, Turkey, Egypt, Morocco, Saudi Arabia and Tunisia, within the MENA region. The aim is to investigate the investment opportunities in these sampled countries in consideration of the oil price and the country risk exposure of their excess stock returns. They have unique characteristics and some political/economic instabilities during the sample period which make the country based local factors important in correctly measuring the systematic risk. While Saudi Arabia, Turkey and Egypt are emerging markets that attracted large capital flows during the sample period, Jordan, Morocco and Tunisia are frontier markets. In addition, Saudi Arabia is a leading net export exporting country in the region, while Turkey's economy relies on oil import. On the other hand, while Egypt, Morocco and Jordan are not net oil exporters yet have some production and are not heavily dependent on oil.

Monthly data is used from 31.01.2005 - 31.12.2018 which include both tranquil and crisis periods such as the Arab Spring starting from 2011 and the global financial crisis of 2008 – 2009. In this regard, we employ a two-state Markov-switching model in order to capture the regime dependence of the systematic risk. As an extension of the basic idea of the ICAPM as originally proposed by Sharpe (1964) and Lintner (1965), we include the composite country risk rating as local/regional specific factors in

explaining excess returns in the sampled financial markets. On the other hand, the oil price, other than the world index, is an important global factor that may affect the excess returns as any factor affecting the expected cash flows will be transmitted to the stock returns. In addition, the VIX index (fear gauge) is also included in the MS-ICAPM as a control variable. Based on this model set up, the aim is to assess the investment possibilities in these countries' financial markets over the sample period and provide an adequate model to correctly measure the systematic risk at the aggregate level.

The empirical results confirm the nonlinear relationship of the ICAPM model for all the countries, implying that beta is actually time-varying over the sample period. Secondly, the estimated values of beta are found to be highly statistically significant for all the countries in both low and high volatility regimes. In general, in the MS-ICAPM, (model 2.2.1) the systematic risks of Saudi Arabia are slightly higher than the world average in high volatility regime, while estimated betas of Morocco, Egypt and Tunisia are higher under the low volatility regime, which suggest that these markets are attractive to financial investors. The highest return is observed in Morocco which is well above the world index. On the other hand, investment in Turkey yielded excess returns similar to the world average during the stable regime.

In addition, we can assess the predictive power of oil risk and country-specific risk factors in determining the equity premium in these markets after controlling for the global factor of 'fear gauge' the VIX index. For instance, CR has been an important predictor of excess returns in Tunisia, Turkey with a positive sign that imply as these countries becomes less risky excess returns become higher during the high volatility regime. In Turkey, the CR factor has also time effect during the high volatility state

with a negative sign. In Egypt, as the country becomes risky, this risk is compensated by higher excess returns during high volatility state which also has time effect. CR factor has been observed to exert a significant impact on excess returns during the stable regime in Egypt but with a reversed sign.

The stock returns of four countries show sensitivity to the oil price risk exposure: Saudi Arabia, Tunisia Egypt and Turkey. As Saudi Arabia is a net exporter of oil, oil price risk exposure increases its equity premium during the stable state of the country. Egypt is the other country which is positively affected from higher oil prices during the tranquil regime. However, Turkey which is heavily dependent on oil imports is negatively affected from oil price shocks with a time factor during the stable regime. VIX index which is another global factor significantly affects all markets' excess returns.

In general, the estimated models support the important role of both the global and the local factors in predicting risk premium in these markets. On a country basis, the only country which was insulated from CR and Oil shock factors was Jordan. Others, have been sensitive to CR factor and oil price shocks as well as the investor's perceptions about the financial, economic conditions depending on the state of the markets. Despite some political, economic and regional instabilities and country risk factors, the estimates of betas support beneficial investment opportunities in most of the countries, at least as profitable as the world index. These results are important for policy makers and investors to help attract foreign investment. In this respect, it is suggested that governments should consider revising their regulations in order to attract foreign capital in promoting their economies.

The results of this current study are also consistent with existing literature in the sense that our results confirm that the investment on the high excess return with higher risk rating in diversified portfolio will at least reduce the portfolio risk and increase its expected return, however depend on the state of the market.

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APPENDIX

Appendix 1: Correlation Matrix Of The Variables

	DLJD-DTB	DLTR-DTB	DLMOR-DTB	DLSA-DTB	DLTUN-DTB	DLWI-DTB	DCRJD	DCRTR	DCREG	DCRMOR	DCRSA	DCRTUN	DLOP	DVIX
DLJD-DTB	1.000	0.4697	0.947	0.922	0.9551	0.95302	0.066	0.103	0.0910	0.122	0.119	0.105	-0.049	0.093
DLTR-DTB		1.0000	0.468	0.505	0.4437	0.50656	0.027	0.016	0.008	0.261	0.287	0.0358	0.136	-0.039
DLMOR-DTB			1.000	0.908	0.9636	0.96046	0.0400	0.070	0.061	0.092	0.0991	0.0655	-0.0883	0.0729
DLSA-DTB				1.000	0.9115	0.92675	0.0629	0.093	0.066	0.116	0.1314	0.0840	0.0008	0.011
DLTUN-DTB					1.000	0.95751	0.072	0.097	0.099	0.111	0.1170	0.116	-0.1087	0.104
DLWI-DTB						1.0000	0.0589	0.084	0.081	0.119	0.1238	0.1001	-0.0376	-0.045
DCRJD							1.000	0.906	0.922	0.843	0.878	0.910	-0.1986	-0.009
DCRTR								1.000	0.906	0.837	0.870	0.890	-0.2242	0.012
DCREG									1.000	0.828	0.854	0.897	-0.204	0.052
DCRMOR										1.0000	0.89591	0.83646	-0.1822	-0.0042

