2006

Financial integration of the MENA emerging stock markets

Hazem Ali Marashdeh
University of Wollongong

Financial Integration of the MENA Emerging Stock Markets

A thesis submitted in fulfillment of the
requirements for the award of the degree

Doctor of Philosophy

from

University of Wollongong

by

Hazem Ali Marashdeh

BEc (Economics and Accounting), Jordan

MEc (Economics), Jordan

School of Economic and Information System

2006

Certification

I, Hazem Marashdeh, declare that this dissertation, submitted in fulfillment of the requirement for the award of Doctor of Philosophy in the faculty of commerce, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Hazem Marashdeh

December 2005

Dedication

To the dearest friend

my father

Ali Marashdeh

Acknowledgments

I would like to express my sincere gratitude and appreciation to my supervisor Associate Professor Edger Wilson for his supervision, guidance and encouragement throughout the study. His profound knowledge and experience provided me with the opportunity to broaden my knowledge and to make a significant progress. Also I would like to thank Associate Professor Amnon Livermore for his supervision through most of the study. His insight into economic theory and creative comments were of a great assistance. And I would like to thank Dr. Abbas Valadkhani for his supervision in the final stages of the study. His exceptional editing skills and invaluable suggestions always inspired me to strive for quality work.

I would like to thank my wife Diana Bakir for her love, care and extraordinary support throughout my long study period. Dear Diana, you will always be in my heart.

I am very grateful to my parents, for their blessing, encouragement and support throughout the duration of this study. Also I would like to thank my dearest brother, Mones and my sisters, Arwa, Rabab, Aram, Demh, Layla, Lama and Farah for their encouragement and support. Also, I would like to thank my father and mother-in-law for their support.

Also, I would like to express my sincere thanks to my colleagues at the faculty of commerce, Akhsyim Afandi, Mosayeb Bahlavani, Min Shrestha, Maen Al-hawari and Reetu Verma. I have greatly benefited from their comments throughout my study period. Finally, I would also like to thank Dr. Aktham Maghyereh for his help at the early stage of this study.

Abstract

The main objective of this study is to examine the financial integration among four emerging stock markets in the Middle East and North Africa (MENA) region, namely, Egypt, Turkey, Jordan and Morocco. Their interrelationships with three developed markets, the US, UK and Germany, are also examined. The motivation behind this study is that, although a lot of research has been focused on stock market integration, the emphasis has been mostly on developed markets. Stock market integration in the MENA region has not been investigated deeply enough despite the region being of a global economic and political importance.

To attain this objective, the study conducts recent econometric techniques on the monthly time series of stock market price indices. It starts with testing for a unit root in the presence of structural change at an unknown time of the break, using the Innovational Outlier (IO) model. To empirically examine the financial integration, the study utilizes the newly proposed autoregressive distributed lag (ARDL) approach to cointegration. The ARDL approach has been recognized as more preferable in estimating the long-run equilibrium relationship than other cointegration approaches in small samples with mixed order process. Finally, the study explores the short and long-run dynamic relationships among these markets using Granger-causality within a correctly specified vector error correction model (VECM).

The empirical results indicate that all variables show evidence of non-stationarity, even in the presence of structural change. The endogenously determined times of the breaks for all markets coincide with observed real events which affected each market. This result is consistence with the efficient market hypothesis as the non-stationarity random walk is associated with the weak form of the efficient market hypothesis. Consequently, this result emphasises that the stock markets in the MENA region are efficient.

The cointegration test results show that there are long-run equilibrium relationships among all stock markets in the MENA region. This indicates that stock markets in the MENA region move together in the long-run. So, at the regional level all markets are integrated. At the same time no long-run equilibrium relationship is found between MENA markets and developed markets. This means that the MENA stock markets are segmented from developed markets. However, Egypt was the exceptional

case; the study found that the stock market of Egypt has long-run equilibrium relationship with the US and UK markets.

The implications of these findings are analysed at two levels, the regional and international. At the regional level, the existence if cointegration among the MENA markets implies the existence of the *law of one price* (LOOP). This means that the potential of regional investors for obtaining abnormal profits through portfolio diversification is limited in the long-run. The reason for this is that as the MENA stock markets are cointegrated, abnormal profits will be arbitraged away in the long-run. However, despite no arbitrage opportunities in the long-run, investors can still achieve arbitrage profits through portfolio diversification in the short-run.

At the international level, the results show that stock markets in Turkey, Jordan and Morocco are not integrated with developed markets. This means that there is no long-run impact from developed stock markets towards these markets. However, a long-run relationship is found between Egypt and both US and UK when Egypt is a dependent variable. Based on these results, there are opportunities for international investors to obtain long-run gains through international portfolio diversification in stock markets of Turkey, Jordan and Morocco. Also at the same time, investors from these three countries have the opportunities to obtain long-run gains through investing in developed markets. The existence of long-run relationships between Egypt and both US and UK implies that the potential for investors from the Egyptian stock market to obtain abnormal profit through portfolio diversification in the US and UK is limited in the long-run. However, there are opportunities for achieving abnormal profit by investing in Germany as it is not cointegrated with the MENA markets. In the short-run, arbitrage opportunities and possible profits may also be achieved from diversification as the LOOP may not hold.

In addition to these findings, an important contribution is made by this study. It contradicted Granger's (1986) theory on the relationship between the existence of cointegration and market efficiency. Granger (1986) asserted that the existence of cointegration between two stock prices implies the ability to predict each price movement, which indicates market inefficiency. Also, this study does not fully agree with another stream of studies, such as Wallace (1992), Baffes (1994), Engle (1996), Ahlgren and Antell (2002) and Masih and Masih (2002) in which they asserted that cointegration does not necessarily imply market inefficiency or efficiency. However, what this study tries to bring out is that if cointegration exists between two stock

markets then these markets are efficient in the long-run because the existence of cointegrated vector implies the (LOOP). Therefore, little or no arbitrage opportunities or possible benefit can be achieved from the diversification of a portfolio across markets. However, with the short-run error correction model (ECM), there could exist arbitrage opportunities and possible benefits from diversification. That is, the LOOP may not hold in the short run.

The results of Granger-causality test based on the vector error correction model (VECM) reveal the existence of short-run causal relationships among the MENA markets. This means that these markets influence each other. Also, the results show that developed markets influenced stock markets in the MENA region. In the short-run, there is unidirectional Granger-causality running from stock prices in Turkey, Morocco, the US and UK to Egypt. Also, there is unidirectional Granger-causality running from Germany and the US towards Turkey. In addition, The UK and Turkey are found to Granger-cause the stock prices in Jordan. Finally, there is a unidirectional Granger-causality from Germany to Morocco.

Finally, despite the empirical results show that there is a possibility of an increase in the portfolio equity flow to the MENA stock markets, the statistics of portfolio equity flow show little portfolio inflow to the region from developed countries over the period of study. Some of the reasons behind this situation are that most of these markets are still from some perspective underdeveloped, vulnerable to macroeconomic shocks and political instability in the region. Based on this, the study suggests that huge efforts should be carried on to improve the institutional reforms in these markets and increase the degree of openness for foreign capital. Also increasing the markets capitalization and adopting new technology are very crucial factors for attracting equity portfolio to the region.

Table of Contents

List of Tables

List of Figures

Abbreviations

ADF	Augmented Dickey Fuller
ADR	American Depositary Receipts
AFM	Amman Financial Market
APT	Arbitrage Pricing Theory
ARDL	Autoregressive Distributed Lag
ARVAR	Augmented Restricted Vector Autoregression
ASE	Amman Stock Exchange
AUVAR	Augmented Unrestricted Vector Autoregression
CAPM	Capital Asset Pricing Model
CASE	Cairo and Alexandria Stock Exchange
CMA	Capital Market Authority
CRDW	Cointegration Regression Durbin Watson
CSE	Casablanca Stock Exchange
ECM	Error Correction Model
ECT	Error Correction Term
EMH	Efficient Market Hypothesis
GARCH	Generalized Autoregressive Conditional Heteroscedasticity
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GDR	Global Depositary Receipts
GNP	Gross National Product
HSBC	Hong Kong and Shanghai Banking Corporation
ICAPM	International Asset Pricing Model
IMF	International Monetary Fund
IPO	International Public Offering
IRF	Impulse Response Function
ISE	Istanbul Stock Exchange
JD	Jordanian Dinar
JJ	Johansen-Juselius
JSC	Jordan Securities Commission
LOOP	Law of One Price
MENA	Middle East and North Africa
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Square
PP	Phillips and Perron
SDC	Securities Depository Centre
UVAR	Unrestricted Vector Autoregression
VAR	Vector Autoregressive Model
VDC	Variance Decomposition
VECM	Vector Error Correction Model
WTO	World Trade Organization

Publication from the Research

1 Marashdeh, H., 2005, "Testing For Structural Changes in MENA Equity Markets", *46th NZAE Conference*, New Zealand.

This article has been considered as "a quality assured paper". Available on line at:

http://www.nzae.org.nz/conferences/2005/QA29-Hazem_Marashdeh.pdf

2 Marashdeh, H. and E. J. Wilson, 2005, "Structural Changes in the Middle East Stock Markets: The Case of Israel and Arab Countries", University of Wollongong, *Working Paper*, 05-22. Available on line at:

http://www.uow.edu.au/commerce/econ/wpapers.html

3 Marashdeh, H., 2005, "Stock market integration in the MENA region: An application of the ARDL bound testing approach", University of Wollongong, *Working Paper*, 05-27. Available on line at:

http://www.uow.edu.au/commerce/econ/wpapers.html

4 Marashdeh, H, 2005, "Cointegration and efficiency: An empirical investigation of the Middle East stock markets". A presentation delivered at *Workshop of:* "*Mathematics in Finance*". Sponsored by School of Applied Mathematics and Statistics, University of Wollongong, 25th November 2005.

5 Marashdeh, H, 2005, "Interdependence of the MENA emerging stock markets: A Cointegration Approach", Accepted to the *4th INFINITI Conference on International Finance*, University of Dublin, Trinity College, Monday 12-Tuesday 13 June 2006.

6 Marashdeh, H. and Ali Saleh, 2006, "Re-visiting trade and Budget deficit in Lebanon: Critique", University of Wollongong, *Working Paper*, 06-07.
Available on line at:

http://www.uow.edu.au/commerce/econ/wpapers.html