

THESIS

**INTERNATIONAL CO-MOVEMENT OF STOCK
MARKETS: BRIIC AND PIIGS COUNTRIES**



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STATEMENT OF AUTHENTICITY

I hereby declare that this thesis is my own work but not taken or duplicate from any other works. The contents, compiled by the author's work except from all cited express the main purpose of the research.

Yogyakarta; Indonesia, 16 July 2013

A handwritten signature in blue ink, appearing to read "Hajanirina Andrinantena".

(Hajanirina Andrinantena)

ABSTRACT

During eleven years (January 2002 to December 2012), events and phenomenon such as financial turmoil occur characterizing the International stock markets. New leading economies that still blooming after the global financial crisis emerge known as BRIIC countries whereas some decline; the so called PIIGS countries.

This thesis is then aiming to depict the co-movement within these countries of both groups that serves as knowledge and information for any purposive uses such as international portfolio diversification. Prominent closing price indices from Brazil, Russia, India, Indonesia, China, Portugal, Italy, Ireland, Greece and Spain are used as samples. The time series variables are then tested for stationarity, causality, co-integration, short and long-run relationship through ECT and VECM ending with variable interaction; IRF and FEVD.

Co-movement is then explained by the results as the series are co-integrated with long and short-run relationship. In short run with unidirectional sense, Brazil Granger causes Russia, India and Indonesia. Indonesia is Granger caused by Portugal, Italy and Ireland. Greece is Granger caused by Portugal, Italy, Ireland and Spain. China Granger causes Ireland and is caused by Portugal. In bidirectional relationship; Ireland Granger causes Russia and vice versa. Besides, disequilibrium in short term occurs but not often and only about one to four months during eleven years that means a strong co-movement persists within the countries as only a very few of them do not have significant value in long run. The variable itself has higher impact on the equation, though others like IBOVESPA has impact on ATHEX and RTSI.

Keywords: *BRIIC, PIIGS, co-movement, stationarity test, Granger causality test, Johansen co-integration test, Error Correction Term, Vector Error Correction Model, Impulse Response Function, Forecast Error Variance Decomposition.*

INTISARI

Selama sebelas tahun (Januari 2002 sampai dengan Desember 2012), peristiwa dan fenomena seperti krisis finansial terjadi yang membentuk karakteristik pasar modal internasional. Para Negara dengan perekonomian terkemuka baru yang masih makmur muncul setelah krisis finansial internasional dikenal sebagai Negara BRIIC sedangkan beberapa juga yang mundur disebut Negara PIIGS.

Tesis ini bertujuan untuk menggabarkan pergerakan bersama di antara Negara-negara di dalam dua keleompok tersebut. Bermaksud untuk melayani sebagai informasi dan pengetahuan untuk semua kepentingan terkait, misalnya, pembentukan diversifikasi portfolio internasional. Sebagai sampel digunakan adalah harga penutupan indeks yang unggul dari Brasil, Rusia, India, Indonesia, Cina, Portugal, Italia, Irlandia, Yunani dan Spanyol. Variabel-variabel *time series* akan diuji untuk stasioneritas, kausalitas, kointegrasi, hubungan jangka pendek dan jangka panjang melalui metode ECT dan VECM; prosesnya akan diakhiri dengan interaksi variabel: IRF dan FEVD.

Pergerakan bersama akan dijelaskan dengan hasil pengujian jika *series* terkointegrasi baik dalam hubungan jangka panjang walaupun jangka pendek. Untuk jangka pendek searah, Brasil menyebabkan Rusia, India dan Indonesia secara Granger. Indonesia disebabkan oleh Portugal, Italia dan Irlandia secara Granger. Yunani disebabkan oleh Portugal secara Granger. Mengenai hubungan dua arah, Irlandia disebabkan oleh Rusia secara Granger dan sebaliknya. Selain itu, ketakseimbangan dalam jangka pendek terjadi akan tetapi tidak sering karena hanya sekitar satu sampai empat bulan selama sebelas tahun; itu diartikan bahwa, pergerakan bersama ketat bertahan di dalam hubungan Negara-negara. Lagi pula, hanya beberapa Negara saja yang tidak mempunyai nilai signifikan dalam jangka panjang. Variabel itu sendiri berpengaruh besar di dalam persamaan, sedangkan variabel lain seperti IBOVESPA berpengaruh pada ATHEX dan RTSI.

Kata kunci: *BRIIC, PIIGS, pergerakan bersama, uji stasioneritas, uji kausalitas Granger, uji kointegrasi Johansen, ECT, VECM, fungsi impuls respon, ramalan dekomposisi kesalahan varians.*

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This thesis is far from being perfect, critics and suggestions are appreciated for a better academic achievement. May this work contribute to all readers' well-being. Mt.7:7-11, Jn.3:16, Jer.29:11, Is.41:10, Ps.139:1-24;145:19, Pvb.23:18.16

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List of Abbreviations

ADF: Augmented Dickey-Fuller

AIC: Akaike Information Criterion

ATHEX: Athex Composite Share Price Index (Greek Index)

BRIC: Brazil, Russia, India and China

BRIIC: Brazil, Russia, India, Indonesia and China

BRIICS: Brazil, Russia, India, Indonesia, China and South Africa

CAPM: Capital Asset Pricing Model

CECA: Comprehensive Economic Cooperation Agreement

CEE: Central and Eastern Europe

CNXNIFTY: National Stock Exchange Fifty (Indian Index)

DF: Dickey-Fuller

DJIA: Dow Jones Industrial Average

DP: Domestic Portfolio

e: constant or Euler's number is a mathematical constant. $e = 2.718281828459\dots$

ECI: Economic Convergence Index

ECM: Error Correction Model or Error Correction Mechanism

ECT: Error Correction Term

EMU: Economic and Monetary Union (of the European Union)

EViews 7: Econometric Views version seven

FEVD: Forecast Error Variance Decomposition

Forex: foreign exchange

FPE: Final Prediction Error

FTSE: MIB Milano Italia Borsa FTSE Group

G7: Group of Seven (world's seven most industrialized economies)

GARCH: Generalized Autoregressive Conditional Heteroskedasticity

GDP: Gross Domestic Product

GEA: Group of Applied Economics

GVA: Gross Value Added

H: high

H₁: Hypothesis one (first hypothesis)

H₂: Hypothesis two (second hypothesis)

H₀: null hypothesis

HPR: Holding Period Return

HQ: Hannan-Quinn information criterion

IBEX 35: Índice Bursatil Español, or Spanish Exchange Index

IBOVESPA: Index of BOlsa de Valores do Estado de SãoPAulo (Brazilian Index)

IP: International Portfolio

IRF: Impulse Response Function

ISD: Index of Structural Divergence

ISEQ: Irish Stock Exchange

JKSE: Jakarta Stock Exchange Composite Index (Indonesian Composite Index)

KBRI: Kedutaan Besar Republik Indonesia (Indonesian Embassy)

L: low

ln: natural logarithm, logarithm base e

n.d.: no date

NASDAQ: National Association of Securities Dealer Automated Quotation

OECD: The Organization for Economic Co-operation and Development

OLS: Ordinary Least Square

PIGS: Portugal, Italy, Greece and Spain

PIIGS: Portugal, Italy, Ireland, Greece and Spain

PP: Phillips-Perron

PPP: Purchasing Power Parity

PSIG: Portuguese Stock Index General Index

RBI: Reserve Bank of India

RTSI: Russian Trading System Index

SC: Schwarz information criterion

SCI: Structural Convergence Index

SSE: Shanghai Stock Exchange Composite Index (Chinese Composite Index)

UAE: United Arab Emirates

UAJY: Universitas Atma Jaya Yogyakarta (Atma Jaya University, Yogyakarta)

UK: United Kingdom

US: United States (of America)

USD: United States Dollar

VAR: Vector Auto-Regression

VECM: Vector Error Correction Model