

International Conference of Organizational Innovation



2012 International Conference of Organizational Innovation

0110101



IOI
Indonesia
2012
International Conference
of Organizational Innovation

IAOP International Association of
Organizational Innovation, USA

Location Airangga University, Campus B, Jalan Airangga No.4 Surabaya, 60286 Indonesia

Conference Date July 10-12 2012

	Airangga University, Surabaya, Indonesia
	Jasmine Publications, Taiwan
	Swinburne University of Technology, Australian
	De La Salle University, Manila, Philippines
	Nanjing Auditing University, Nanjing, China
	Southeastern Louisiana University, USA
	International Association of Organizational Innovation, USA
	Chang Jung Christian University, Taiwan
	University Kebangsaan Malaysia, Malaysia
	Far East University, Taiwan
	Naha University, Taiwan
	Southeastern Louisiana University, USA

**PROCEEDINGS OF
2012 ICOI THE INTERNATIONAL CONFERENCE ON
ORGANIZATIONAL INNOVATION**

JULY 10 – 12, 2012

Editor in Chief

Dr. Shieh, Chich-Jen

Department of International Business
Chang Jung Christian University, Taiwan

Editor

Dr. Shang-Pao Yeh

Department of Tourism,
I-Shou University, Taiwan, ROC

Dr. Chou, Jyh-Rong

Department of Creative Product Design
I-Shou University, Taiwan, ROC

T. Aria Auliandri

Department of Faculty of Economics and Business,
Airlangga University, Surabaya, Indonesia

HOSTED & ORGANIZED

Institute of Sponsor:

International Association of Organizational Innovations, USA
Airlangga University, Surabaya, Indonesia
Chang Jung Christian University, Taiwan
Jasmine Publications, Taiwan

Institute of Cosponsor:

University Kebangsaan Malaysia, Malaysia
Nan Hua University, Department of Applied Art and Design, Taiwan
De La Salle University, Manila, Philippines
Nanjing Audit University, School of Economics, China
Southeastern Louisiana University, USA
Far East University, College of Hospitality and Leisure, Taiwan
Swinburne University of Technology, Master of Entrepreneurship and Innovation, Au

CONTENTS

1. Business Administration

12R-095: Trade in Hosiery under Free Trade Agreements: Upgrading Performance of a Manufacturer in Taiwan.....	1
12R-102: A Study on the Sabotage Behavior from Employee Prospective.....	2
12R-103: The Relationship of Customer-employee from Self-Image Congruence Prospective.....	3
12R-116: The Prominent Roles on the Strategic Alliances Performance - Procedural Justice, Knowledge Absorptive Capacity and Trust.....	4
12R-134: Influential Factors that Affect the Purchasing of Hybrid Cars – Across Nation Stud”.....	5
12R-141: Effects of Perceived Corporate Sponsorship.....	6
ICOI-08: The Influence of the Mechanism of Good Corporate Governance on the Company’s Performance through Corporate Social Responsibility Disclosure on Manufacturing Companies Listed in the Indonesia Stock Exchange on 2007 – 2009.....	7
ICOI-37: Governance Score to Determine Efficiency in Corporate Governance Practices.....	8
ICOI-48: Corporate Social Responsibility Programs as a Business Sustainability Support.....	9

2. Case Study

12R-056: Effects of E-Learning on Learning Performance – A Case Study on Students in Tourism Department in Taiwan.....	10
12R-075: Local Wisdom Priority in Budget Decision Making Process: An Exploration Universal Value in Decentralized Decision Making- Case Study in East Java Province.....	11
12R-082: Research on Organizational Fields and Competitive Advantage---Based on the Case Study of Eastman Kodak Company and Apple Inc.....	12
12R-121: Assessing Student Dormitory Service Quality by Integrating Kano Elaborative Mode with Quality Function Deployment Method - a Case Study in a Hospitality College in Southern Taiwan.....	13
ICOI-32: Information Systems Strategic Planning to Increase Competitive Advantage of Higher Education Using be Vissta Planning Methodology: Case Study SWCU Salatiga.....	14

ICOI-52: The Urgency of Communication Media (E-Commerce) In Indonesian Creative Industry as an Effort to Increase the International Business Competition: Case Study in Fashion Industry.....	15
---	----

3. Consumer Behavior

12R-118: The Study on Service Quality, Customer Satisfaction and Loyalty of the Restaurant Industry.....	16
12R-125: Explore the Relationship between Service Quality and Customer Loyalty, Brand Equity as Moderator and Marketing Tools as Mediator.....	17
ICOI-07: Customer Relationship Management Increasing the Customer Loyalty and Equity.....	18
ICOI-34: Impulse and Unplanned Buying: Comparisons of Determinants and Consequences.....	19
ICOI -41: The Effect of Fashion Involvement to Fashion Oriented Impulse Buying With Consumers Positive Emotion as a Mediating Variable.....	20
ICOI -42: The Influences of the Big Five Personalities and Consumers Materialism to Impulsive Purchasing and Its Effect to Compulsive Purchasing: A Survey of Mall Customers in Bandung.....	21
ICOI-54: A Conceptual Model of IT Investment Feasibility Analysis for Small and Medium Enterprises.....	22

4. Economics

12R-012: Volatility-Credit Nexus in Taiwan as a SME-based Economy.....	23
12R-040: Evolution of Technological Innovation and Development of China's Innovative Economics.....	24
12R-080: The Prospects of Innovative Economies Development in the Dynamics of Globalization and Technological Progress.....	25
12R-105: The role of an innovative component in strengthening of economic safety of countries in modern conditions of post-crisis development of world economy.....	26
12R-117: Impact of International capital flow on China's Current Account: Adjustment from Trade and Financial Channels.....	27
ICOI-15: Institutional Models of Bunaken National Park (BNP) Management to Ensure Sustainability of Ecological and Economic Functions.....	28

ICOI-64: How Demographics And General Economic Mood Affect Investor Risk Tolerance?.....	29
5. E-learning	
12R-048: Identifying Key Success Factors of E-Learning in Travel Agents....	30
12R-098: Adult and Youth Students' Perceptions of Online Courses Effectiveness: A Comparative Study.....	31
12R-138: The Application of the Ipad on Children's Play-based on Brain Science Theory.....	32
12R-147: Design and Exploration of Mobile Navigation and Teaching Activity Based on Integrating Learning and TAM Models – A Study of the Ecological Course.....	33
6. Education Administration	
12R-025: An Empirical Study: Students' Perception on Service Quality –Using Malaysian HEdPERF Measurement Scale.....	34
12R-037: A Study on the Physical Response and Behavior of Infants with Disabled Left Hand in In-line Skate Learning.....	35
12R-038: A Study on Learning Motivation of Preschool Children Receiving Classics-Reciting Education toward Learning Outcomes.....	36
ICOI-55: Globalization and Internationalization in Business & Management Education.....	37
7. Entrepreneurship	
12R-067: Entrepreneurship and growth in emerging mini-dragon economies: A South-East Asia Perspective.....	38
ICOI-09: The Development of Entrepreneurship Character in Improving Performance: A Survey on Small Scale Entrepreneurs of Seaweed in South Sulawesi.....	39
ICOI-49: Motivational Factors, Entrepreneurship, Gender, And Parental Background: Evidence From the Tailor's Guild at Sunan Giri Traditional Market, Jakarta, Indonesia.....	40
ICOI-56: Entrepreneurial Intentions of Students.....	41
ICOI -62: Entrepreneurial Research University: An Experience Of Universities Airlangga for Synergizing Industry-Government-University	42

ICOI-65: The Effect of Inter organizational Network and Product Innovation Process on Marketing Performance: Evidence from the Micro Enterprises in Java from Entrepreneurial Marketing Perspective....	43
---	----

8. Financial Management

12R-030: How does Divergence of Opinion Affect the Relative Trading Activity and Information Content in Option and Stock Prior to Takeover Announcement?.....	44
12R-060: Strategy of Board Structure on Financial Performance : The Empirical Analysis of Chinese Companies with Issued ADRS.....	45
12R-085: Financing Gap in Malaysian Small-Medium Enterprises: A Supply-Side Perspective.....	46
12R-088: The Power of Subordinated Lévy Models to Depict the Arrival of Innovative Information.....	47
12R-126: Constructing an Outpatient Medicare Demand Model for Respiratory Diseases with Opportunity Cost of Medical Treatment-An Application of the Travel Cost Method.....	48
ICOI-03: Factors that Affect the Profitability of the Conventional Bank and Shariah Bank in Indonesia.....	49
ICOI-36: The Influence of Book-Tax Differences, Going Concern Opinion, and Auditor Industry Specialization on Audit Delay and the Influence of Audit Delay on Timeliness on Manufacturing Companies Listed in Indonesian Stock Exchange Period 2007-2010.....	50
ICOI-44: The Effect of Profitability, Liquidity, Leverage, Firm Size and Growth Opportunities to Dividend Policy on Firms Listed Indonesia Stock Exchange during the Period of 2006-2009.....	51
ICOI-45: Analysis of Fundamental Factor and Management Capability as Predictor of Financial Distress.....	52
ICOI-51: Enterprise Resource Planning: A Risk Management Tool to Avoid Corporate Frauds in Financial Reporting.....	53
ICOI-66: The Impact of Liquidity to Stock Returns: Test of Liquidity Proxies.....	54
ICOI-67: The Effect of Exchange Rate Fluctuations on Industrial's Stock Returns; Evidence from Indonesia.....	55

9. General Management

12R-032: The Research on the Core Competencies Indicator of Cross-Strait Air Freight Forwarder.....	56
12R-065: Studying the Effect of Hospitality Interns' Personality Traits and Their Emotional Labor over Organization Citizenship Behavior.....	57
12R-142: Gender Variations Across: Trainee Motivation, Social Support and Goal Orientation.....	58
ICOI-26: An Exploratory Study: The Reasons Why People use Laundry by The Kg Service and Why They Choose CYARA Laundry?.....	59
ICOI-28: The Study of Intellectual Ability, Competence and Their Impact on the Performance's Lecture.....	60
ICOI-30: Lean in Healthcare Sector: Lessons from Implementing Lean in Hospital.....	61
ICOI -40: The Relationship between Job Decision Latitude, Task Demand, Commitment and Social Support with Job Satisfaction: A Study On Talented Managers in XYZ Company.....	62

10. Higher Education

12R-073: The Psychological and Learning Impact of Teaching Language Used in English Classes on 5-Year Junior College Students in Taiwan.....	63
12R-077: A Study of Knowledge Management within the Bachelor- Master Structure in the Netherlands.....	64
ICOI-23: Learning Outcomes of the Japanese Language Class In the School Of International Hospitality and Tourism Management (SIHTM) In the University of Baguio, Philippines.....	65
ICOI-39: Learning Style Analysis for Students of Business Management Study Program of Telecommunication and Informatics Telkom Institute of Management.....	66
ICOI-58: Responding Changes of Market Requirement by Mixing Culture, Strategy and Structure in Innovative Higher Education Organization.....	67

11. Human Resource Management

12R-036: Integrating Human Resource Management and Knowledge Management—From the Viewpoint of Core Employees and Organizational Performance.....	68
--	----

12R-050: A Study the Performance on Human Resource Management Strategy in Tourism Industry.....	69
ICOI-11: The Effect Of Conflict Toward Job Stress And Its Impact To Employees Performance: Case Study At The Public Hospital In Makassar.....	70
ICOI-50: The Influence of Affective, Continuance, And Normative Commitment towards the Turnover Intentions of Nurses at Makassar's Private Hospitals in Indonesia.....	71
ICOI-53: Effect on the Performance of Employees Compensation in PLN Generating and Parent Project Network Java and Bali Nusa Tenggara Southeast.....	72
ICOI-60: The Role of Electronic Human Resources to Leverage Human Resources Management as a Strategic Business Partner.....	73
ICOI-68: Analysis of the Factors Influencing Hr Performance of Syariah Banking through Cultural Development.....	74

12. Hospitality Management

12R-054: Effect of Recreational Involvement on Stress Relief and Job Performance in Restaurant Workers: The Moderating Role of Psychological Contract.....	75
12R-122: A Research Regarding Consumer Preferences to Sweet Potato Cake and Purchase Intention by Using Sensour Evaluation.....	76
12R-124: The Study on the Relationship between Interior Space Design of Restaurants and Customer Satisfaction.....	77
ICOI-22: Food Choice Determinants in Fast Food Restaurants.....	78
ICOI-38: Employee Service Performance and Customer Outcomes: Evidence From a Tourist Destination.....	79

13. Industrial Management

12R-045: Application of Integrated Robust Designation Methodology in Multi-Objective Optimization.....	80
12R-074: Mixed Oligopoly and Technology Licensing.....	81
12R-078: Applied the Malmquist Productivity Index to Evaluate the Cross Year Efficiency on the Non-profit Hospitals in Taiwan.....	82
12R-081: Technological Opportunities across Different Industries.....	83
12R-093: Pricing Strategies of Upstream and Technology Licensing.....	84

12R-140: Using Weighted Attributes of the Rough Set Model to Balance Construction and Service Quality Costs for Local Supply Chain Management.....	85
ICOI-27: Implementing Material Requirement Planning To Increase the Efficiency of Remaining Raw Materials of Small and Middle Businesses.....	86
ICOI-35: Differential Equity Contributions between Partners in Joint Ventures.....	87
ICOI -57: Critical Success Factors In the Implementation of Total Quality Management in Selected Fertilizer Companies in Cikampek Indonesia.....	88
ICOI -63: Designing Quality Improvement of Small and Medium Business Enterprises of Leather Handbags (Smes) In Sidoarjo, Indonesia by Applying Quality Function Deployment Model.....	89

14. Innovational Management

12R-066: Influences of the Creativity Management Tools.....	90
12R-079: Mentality as a Factor of Innovative Model of Management in Modern Russia.....	91
12R-086: Innovative” Transformation of Scientific Institutions.....	92
12R-139: Engaging Communities of Lead Users with Technology: Findings from a European Eparticipation Project.....	93
12R-143: Development of Corporate Culture of Innovations.....	94
12R-146: A Study on Online Apparel Customization: Fashion Innovativeness as a Moderator.....	95
ICOI-02: A Team on Management Innovation How is it better than Individual Change Agent?.....	96
ICOI- 17: Innovation of Validation Model for Group Decision Support on Product Design Selection.....	97
ICOI-25: SHOLAT as a Means to have Innovative Thinking in Business Transformation.....	98
ICOI -43: The Model of Competitive Advantage through Business Innovation: Design From Organizational Creativity, Entrepreneurial Competence and Market Orientation (Survey at Sme's Coastal Batik in Java).....	99
ICOI-59: The Roles of Consumer Innovativeness and Risk Propensity in Evaluating Credibility of Social Media and Developing Initial Trust among International Backpackers.....	100

15. Information Management

12R-058: Developing Perturbation Rate of the Rough Set Theory to Evaluate the Electronic Transaction Quality of On-Line Shopping.....	101
12R-072: Accumulating Destination Knowledge Management through Social Network Perspective.....	102
12R-076: Effectiveness of Human Resource Information System on HR Functions Of the Organization-A Cross Sectional Study.....	103
12R-084: South African Tour Operators' Critical Need for Marketing Information System Innovation.....	104
12R-145: An Innovative Design of Chatbot System Development and Learners' Performance Evaluation.....	105
ICOI-18: Mapping and Analysis the Operational Distribution System of Digital Multimedia Products at Pt Direct Vision.....	106
ICOI-19: The Application of Management Information System Based On Cloud Computing for the Export-Oriented Indonesian Small Medium Enterprises to the Emerging Markets in Japan and Taiwan.....	107
ICOI-31: The Application of Geographical Information System on The Land Management in Indonesia: A Legal Entity Perspective.....	108
ICOI-46: Generation C: A TRULLY Amazing Opportunity For Small Business.....	109

16. Marketing Management

12R-044: Study on the Development of Corporate Brand Image.....	110
12R-090: Evaluating Brand Equity from the View of the Customers in Banking.....	111
12R-115: Marketing of Financial Services by Islamic Banking Institutions in Iran.....	112
ICOI-14: The Effect of Experiential Marketing Implementation toward Repurchase Intention in Fast Food Restaurant at the City of Padang: Survey on the Andalas University's Student.....	113
ICOI-024: Exploring Socio-Technical Factors to Successful Collaborative Design in Product Development: A Review.....	114

17. Organizational Behavior

12R-034: "Green" Management and Leadership for "Greenovate" Organizational Development.....	115
---	-----

12R-062: The Effect of Competency Promotion on Organizational Performance in Public Sectors.....	116
12R-064: The Effect of Network Relationship on Organizational Performance in Public Sectors.....	117
ICOI -61: Narcissism As an Organizational Value: It's Impact on Corporate Deviance.....	118

18. Performance Management

12R-041: DEA Approach for the Operating Efficiency Measurement: Assessment of Taiwanese Solar Cell Companies.....	119
12R-132: Performance Evaluation of Chinese Power Supply Firms.....	120
ICOI-33: Measuring Performance of Indonesian Cellular Telecommunication Industry from Customer Perspective.....	121
ICOI-47: Role of Shari'A Supervisory Board and Financial Performance as Determinants of Csr Disclosure of Islamic Banks in Indonesia.....	122

19. Produce Design

12R-094: An Approach for Innovative Design Based on Extension Method...	123
12R-097: Universal Design Assessment based on Fuzzy Linguistic Techniques.....	124
12R-101: A Study on the Correlation between Furniture Design Information Modules and the User Need of Designers.....	125
12R-107: Application of Concurrent Design Strategy on the Design of Portable Amplifier.....	126
12R-108: Integration of Concurrent Design Strategies in the Form and Structure of the Juicer Research.....	127
12R-109: Using Collaborative Design Strategy at Research of the Toilet by Universal Design Concept.....	128
12R-110: Many Layout Strategies Are Applied to the Fan Global Design of Heat Dissipation.....	129
12R-111: Research on Cognition Difference of Product Shape: A Case Study of Male Perfume Bottle.....	130
12R-112: Research On Young People's Evaluation Perfumes.....	131
12R-114: A Study on the Application of Constructionism and Constructivism to the Learning Efficiency of Artificial Model Assembly through Quasi-experimental Research.....	132
12R-128: Involvement Evaluation for Innovative Products in Remote Districts-Using Pingtung Image in Taiwan as an Example.....	133

12R-130: Research & Development on Innovative Designs for Water Dispenser.....	134
12R-137: A Cognitive Research of Cultural Images in Taiwan.....	135

20. Strategic Management

12R-023: Innovative Strategies for Acquiring IT Applications among Selected Companies in Metro Manila, Philippines and its Benefits	136
12R-069: The Effect of Using Metacognitive Strategies on Listening Comprehension of Iranian EFL Learners.....	137
12R-092: A Research on Taiwan's Own Brand LUXGEN Automobile's Innovative Strategies.....	138
ICOI-06: Intellectual Capital Management Strategy to Enhance Indonesian Worker Unions Performance.....	139
ICOI-69: Industrial Development Strategy in South Sulawesi Province.....	140

21. Tourism Management

12R-007: Implementing Blue Ocean Strategy in the Ecotourism Industry.....	141
12R-022: A Study of the Demand for Domestic Tourism by Taiwan Households Using Almost Ideal Demand System Model.....	142
12R-047: Establishment of Effect Model of Participation Experience in Enterprise Sports Games on Leisure Benefits and Organizational Commitment.....	143
12R-100: Measuring Value Chain Efficiency of Tourist Hotels in Taiwan.....	144
12R-119: The Study on the Association between the Service Quality of Tourist Hotel and Customer Satisfaction.....	145
12R-136: A Study of Students' Learning Motivation towards an English Course for Tourism Students.....	146
ICOI-12: Improving Hotel Performance through Active Supply Chain Risk Management: A Preliminary Model.....	147

22. Others

12R-017: Isn't the IUCN reflecting the Environmental Organizational Behavior? A Close Look.....	148
12R-053: An Analysis of Large and Small Group Peer Led Teaching for Basic Sciences Medical Students.....	149

12R-070: Simulation of Stability and Instability Criteria of Current- Voltage Characteristics in the Negative Differential Conductance Region of a Resonant Tunneling Diode.....	150
12R-144: Biofuels, Ammonia and the Three E Policy Goals.....	151
ICOI-04: Application of Garch Model for Index Lq45 and Jii Period 2000 – 2011.....	152
ICOI-05: Option Value Estimation of Lq45 and Jii Index Using Garch Model in Determining Volatility.....	153

Application Of Garch Model For Index Lq45 And Jii Period 2000 – 2011

Irni Yunita
Institute Management Telkom, Bandung
Email: irniyunita81@yahoo.com

Abstract

Volatility is a measurement statistically in price variation of an instrument. Investor who conducts an investment in assets having high volatility will tend to deal with higher risk as compared with investor who conducts an investment in assets having low volatility.

The objective of this research is to model volatility of data instrumentt index LQ45 and JII from period 2000 to 2011. The result of stationarity test shows that data index LQ45 and JII is stationary, so it has been done a modeling by using ARIMA. The best ARIMA model for index LQ45 is ARIMA(1,0,12), while for index JII is ARIMA(1,0,0). But after doing heteroscedasticity test to the best ARIMA model, it has been detected that data still contain heteroscedasticity element. Hence, in determining the volatility, which is a risk indicator of a index, it will be obtained by using Autoregressive Conditional Heteroscedasticity/Generalized Autoregressive Conditional Heteroscedastic (ARCH/GARCH) approach. The criterion of a best model option is based on the values of AIC and SIC are smallest than several model available.

The final result shows that for index LQ45, a best model for modeling the volatility is by using GARCH(2.2) as follow: $\sigma_t^2 = 0.000003548 + 0.164427 * e_{t-1}^2 - 0.131824 * e_{t-2}^2 + 1.48759 * \sigma_{t-1}^2 - 0.53134 * \sigma_{t-2}^2$. While for index JII, a best model is by using GARCH(1.2) as follow: $\sigma_t^2 = 0.0000199 + 0.0141732 * e_{t-1}^2 + 0.452702 * \sigma_{t-1}^2 + 0.348864 * \sigma_{t-2}^2$. The value of volatility index LQ45 is at 0.055849 and index JII is at 0.026165.

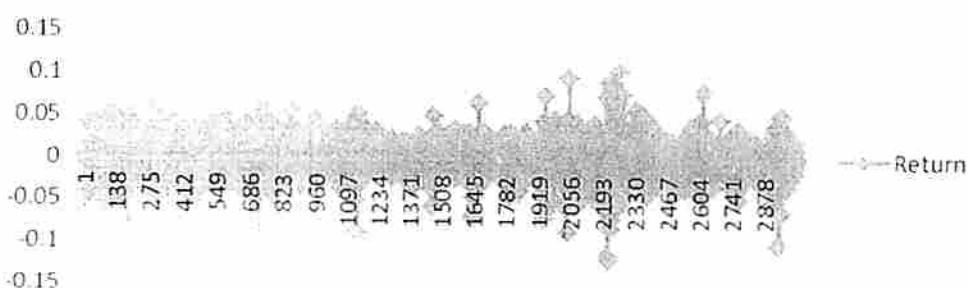
Keywords: Volatility, Index LQ44, Index JII , ARIMA, ARCH/GARCH, AIC, SIC.

RESEARCH BACKGROUND

Volatility is a statistical measurement of variation in the price from the an instrument. Investors who invest in assets that have a high volatility will likely face a higher risk than the investors who invest in assets that have low volatility.

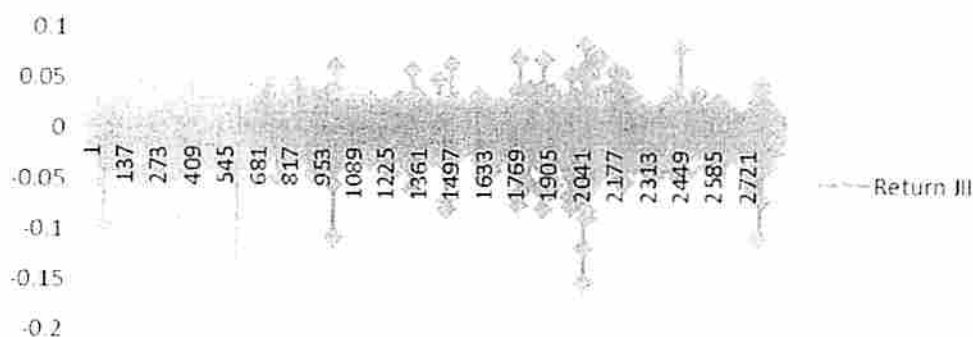
The purpose of this study is to model in advance the volatility of data instrument index LQ45 and JII period 2000 to 2011. The phenomenon of return data index LQ45 and JII period 2000 - 2011 was presented in the figures 1.1 and 1.2.

Figure 1.1
Return Index LQ45



Source: Indonesia Stock Exchange, processed (2012)

Figure 1.2
Return Index JII



Source: Indonesia Stock Exchange, processed (2012)

In the figures 1.1 and 1.2 it has been seen that the movement of return data index LQ45 and JII has a change movement that tend to be high. Once upon a time it may occur a sharp increase, and then it also occurs a sharp decrease. It can show that there is an high volatility in data index LQ45 and JII, furthermore in the determination of volatility, which is risk indicator of index, it will obtained by using *Autoregressive Conditional Heteroscedasticity/Generalized Autoregressive Conditional Heteroscedastic* (ARCH/GARCH)

Since the "discovery" in 1982, ARCH models have become a growth study with a wide range of variations on the original model. One that has become more famous is the generalized autoregressive conditional heteroscedasticity (GARCH), which was originally introduced by Bollerslev.

Autoregressive Integrated Moving Average (ARIMA)

GARCH method was applied through two processes: the process mean and process variance. Mean the process was first suggested by the Box-Jenkin (1976) by analyzing time series with a combination of autoregressive (AR) and moving average (MA). This method is then integrated into ARIMA to get a stationary time series.

Gujarati (2003) describe the Box-Jenkins methodology in four steps, namely identification, estimation, diagnostic checking, and forecasting. The general form autoregressive model of order p or AR (p) is

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \dots + \alpha_p Y_{t-p} + \epsilon_t \dots\dots\dots(1)$$

Y_t : variables observed

α_0 : constants of autoregresif

$\alpha_1 \dots \alpha_p$: parameter of $Y_{t-1} \dots Y_{t-p}$

Common form of moving average model of order q, or MA (q) is :

$$Y_t = \beta_0 + \beta_1 \epsilon_t + \beta_2 \epsilon_{t-1} + \dots + \beta_q \epsilon_{t-q} \dots\dots\dots(2)$$

Y_t : variables observed

β_0 : constants of moving average

$\beta_1 \dots \beta_q$: parameter of $\epsilon_t \dots \epsilon_{t-q}$

The general form ARIMA models with the autoregressive order p and moving average order q is the:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \dots + \alpha_p Y_{t-p} + \epsilon_t + Y_t = \beta_0 + \beta_1 \epsilon_t + \beta_2 \epsilon_{t-1} + \dots + \beta_q \epsilon_{t-q} \dots\dots(3)$$

Generalized Autoregressive Conditional Heteroscedastic (GARCH)

Bollerslev (1986) completed the result of work of Engle (1982) ARCH model by concluding AR process in heteroscedasticity of variants into Generalized Autoregressive Conditional Heteroscedasticity GARCH (p, q) ; p is a family order of GARCH and q a family order of ARCH, described in the following equation:

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^q \alpha_i e_i^2 + \sum_{i=1}^p \beta_i \sigma_{t-i}^2 \dots (4)$$

with:

e_t^2 = residual at time point t

σ_t^2 = conditional variance in the time t

α_0 = constant

α_i = ARCH coefficient

β_t = GARCH coefficient

e_{t-1}^2 = residual at time point t-i (yesterday period)

σ_{t-1}^2 = conditional variance in the time t-i (yesterday period)

METHOD

DETERMINATION OF THE PERIOD

This study will be used daily LQ45 index information data with the 11-year period ranges from January 2000 until December 2011 and the daily index JII which since July 2000 until December 2011.

STATIONARITY TEST

Stasionarity test has been done to assure that data of return have been stationary. Stasionarity test of return data has been conducted by using ADF (Augmented Dickey-Fuler) test. In order to identify whether the return data have been stationary it can be carried out by comparing the value of ADF test with critical value. If the value of ADF test is smaller than critical value or has smaller probability than 5%, then the data have had no unit roots, in the other words it has been stationary. Conversely, if the value of ADF test is larger that critical value or has larger probability than 5%, then the return data still contain unit roots or in the other words the data are not yet stationary and it must be conducted a process of data differencing until the value of ADF test is smaller than its critical value.

HETEROSCEDASTICITY TEST

Heteroscedasticity test aims to determine whether the variance from the the data return is constant or time varying.

he first step is to estimate the equation moving average with the least square method. The second step is to test the White Heteroscedasticity test heteroscedasticity or ARCH-LM test. In the White ADF table number listed Heteroscedasticity test F-Statistic and probability values. The hypothesis used is:

H_0 : *volatility homoscedastic*

H_1 : *volatility heteroscedastic*

If the number is smaller than the probability of 5% then reject H_0 at the α and it can be concluded that the data return is heteroskedastis. Meanwhile, if the probabilities are greater than 5%, then do not reject H_0 and conclude that the data is homoskedastis.

If σ is homoskedastis, then the implied volatilities calculated using standard deviation, but if a heteroskedastis the implied volatilities are calculated by the method of ARCH / GARCH.

CALCULATION OF VOLATILITY

In calculating the volatility estimates for the LQ45 index and the index will be used JII GARCH models. But before, done with ARIMA modeling. Use of this ARIMA formula after the test stationarity, normality test and homoskedastisitas. If the nature of the data of return is heteroskedastis, not stationary and not normal, then do estimation using ARIMA method. Gujarati (2003) describe the ARIMA methodology in four steps, namely identification, estimation, diagnostic checking, and forecasting.

The first step is the identification of the ARIMA process. This step is done to know whether the observed data are stationary. If you do not stationary diferensi process until the data is stationary. Stationarity test is then performed using the Dickey-Fuller unit root test (Gujarati; 2003)

The second step is the estimation of parameters of autoregressive and moving average based on the order parameter (p and q) are obtained at the identification stage. The third step is to choose the appropriate ARIMA models. Good model is a model that has distributed residual random (white noise).

The fourth step is to do the forecasting value of the observed variables. The best forecasting model was tested again with heteroskedastis test to determine whether the data is still heteroskedastis. If the results show that the results are still heteroskedastis, we then propose a model of ARCH / GARCH.

Modeling of ARCH / GARCH done by estimating the mean equation process with ARCH method. ARCH and GARCH selected can be chosen from different orders of ARCH and GARCH orders and various types of ARCH / GARCH. From the calculation results table ARCH / GARCH variance equation obtained constants for the process and its Z-Statistic and probability, number Akaike Info Criterion (AIC) and Schwarz Criterion (SIC).

To the measurement of the volatility of ARCH / GARCH, there are several steps to choose a model that would be used. The first step to do is to test the significance of the ARCH coefficient or the coefficient of error (α) and GARCH coefficient or coefficient of variance (β). Coefficients were considered significant if the probability of the z-statistic is smaller than the probability of a critical value.

To determine the best GARCH, first performed modeling with ARCH (1), ARCH (2) to indicate the probability is not significant. GARCH modeling is then performed (1,1), GARCH (1,2) to GARCH order is reached indicating that the probability is not significant. Some models are then selected based on AIC and SIC numbers. Good model is a model that has a number of the smallest AIC and SIC. Volatility calculations performed to determine the extent of volatility index LQ45 and JII.

Implied volatilities can be obtained from the model equation ARCH / GARCH that has been obtained, where $\sigma_t = \sqrt{ht}$.

RESULTS

STATIONARY TEST

The method used in this research is by seeing to do Augmented Dickey Fuller (ADF) test. Data have been said to be stationary if the statistic value of ADF > critical value of MacKinnon at $\alpha=1\%$, $\alpha=5\%$ and $\alpha=10\%$. The result of data processing for stationary index LQ45 and JII tests can be seen in the tables 1 and 2.

Table 1. Output of ADF test Statistik Return Index LQ45

Null Hypothesis: RETURNLQ45 has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=28)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-49.91328	0.0001
Test critical values: 1% level	-3.432338	
5% level	-2.862304	
10% level	-2.567221	

*MacKinnon (1996) one-sided p-values.

Source: processed (2012)

Table 2 Output of ADF test Statistik Return Index JII

Null Hypothesis: RETURNJII has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=27)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-49.82053	0.0001
Test critical values: 1% level	-3.432460	
5% level	-2.862358	
10% level	-2.567250	

MacKinnon (1996) one-sided p-values.

Source: processed (2012)

Based on the result of root test of unit ADF in tables 1 and 2 it has been known that in the level of return data index LQ45 it has been stationary. This has been proved by statistic value of ADF (49.91328) > critical value of MacKinnon 1%, 5%, and 10%, so that root test unit supports the conclusion that data can be modeled by ARIMA.

ESTIMATION OF ARIMA MODEL

The results of data processing with the correlogram for the LQ45 index and index JII contained in tables 3 and 4.

Table 3 Correlogram Index lq45 Period 2000 – 2011

Date: 04/14/12 Time: 23:53

Sample: 1 3004

Included observations: 3004

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
*	*	1 0.093	0.093	26.196	0.000
		2 0.010	0.001	26.482	0.000
		3 -0.008	-0.009	26.686	0.000
		4 -0.019	-0.017	27.734	0.000
		5 -0.014	-0.011	28.340	0.000
		6 -0.016	-0.014	29.139	0.000
		7 -0.021	-0.018	30.445	0.000
		8 -0.015	-0.012	31.118	0.000
		9 -0.007	-0.005	31.273	0.000
		10 -0.007	-0.006	31.407	0.001
		11 0.016	0.016	32.182	0.001
		12 0.050	0.046	39.635	0.000
		13 0.020	0.010	40.873	0.000
		14 0.041	0.038	46.001	0.000
		15 -0.017	-0.024	46.848	0.000
		16 0.010	0.015	47.153	0.000
		17 0.012	0.012	47.583	0.000
		18 0.012	0.013	48.026	0.000
		19 0.014	0.014	48.582	0.000
		20 0.024	0.024	50.283	0.000
		21 0.008	0.006	50.467	0.000
		22 -0.031	-0.030	53.294	0.000
		23 0.006	0.012	53.397	0.000
		24 0.038	0.037	57.763	0.000
		25 0.045	0.038	63.887	0.000
		26 0.032	0.023	67.063	0.000
		27 0.001	-0.002	67.065	0.000
		28 0.008	0.008	67.240	0.000
		29 -0.036	-0.036	71.283	0.000
		30 -0.005	0.001	71.357	0.000
		31 0.015	0.017	72.070	0.000
		32 -0.033	-0.037	75.314	0.000

Source: processed (2012)

From Table 3, obtained the order AR (p) the maximum is obtained when the PAC through the dashed lines in lag 1, while the order of MA (p) the maximum is obtained when the AC through the dotted line at lag 1.

Tabel 4 Correlogram index JII Period 2000 – 2011

Date: 04/15/12 Time: 00:04

Sample: 1 2843

Included observations: 2843

	Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
1	0.067	0.067	12.914	0.000		
2	-0.005	-0.009	12.981	0.002		
3	-0.007	-0.006	13.136	0.004		
4	-0.020	-0.019	14.245	0.007		
5	-0.002	0.001	14.253	0.014		
6	-0.007	-0.008	14.407	0.025		
7	-0.023	-0.023	15.978	0.025		
8	-0.001	0.001	15.982	0.043		
9	-0.007	-0.008	16.130	0.064		
10	-0.012	-0.012	16.551	0.085		
11	0.011	0.012	16.920	0.110		
12	0.071	0.069	31.282	0.002		
13	0.019	0.009	32.307	0.002		
14	0.059	0.058	42.365	0.000		
15	-0.007	-0.013	42.486	0.000		
16	0.020	0.025	43.617	0.000		
17	0.017	0.015	44.454	0.000		
18	0.001	0.002	44.455	0.000		
19	0.009	0.012	44.682	0.001		
20	0.009	0.010	44.893	0.001		
21	-0.004	-0.001	44.944	0.002		
22	-0.021	-0.019	46.238	0.002		
23	0.011	0.015	46.566	0.003		
24	0.039	0.035	50.981	0.001		
25	0.030	0.022	53.501	0.001		
26	0.026	0.016	55.493	0.001		
27	0.001	0.000	55.498	0.001		
28	0.014	0.010	56.073	0.001		
29	-0.028	-0.031	58.384	0.001		
30	-0.008	-0.005	58.567	0.001		
31	0.000	-0.001	58.567	0.002		
32	-0.032	-0.034	61.569	0.001		
33	-0.014	-0.011	62.153	0.002		
34	0.006	0.010	62.272	0.002		
35	0.004	0.002	62.329	0.003		
36	-0.001	-0.008	62.335	0.004		

Source: Processed (2012)

From table 4, obtained the order AR (p) the maximum is obtained when the PAC through the dotted line at lag 14, lag12, and lag 1, while the order of MA (p) the

maximum is obtained when the AC through the dotted line at lag 14, lag 12 and lag 1 in the correlogram table.

Having established the order of AR and MA that may be suitable, the next is to determine the estimated value of the parameters in ARIMA models. Tables 5 and 6 in a row is the best estimate of the LQ45 index and index JII.

Table 5 Estimation Results of Model LQ45 Index, ARIMA (1,0,0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000667	0.000352	1.894215	0.0583
AR(1)	0.093369	0.018163	5.140561	0.0000
R-squared	0.008729	Mean dependent var		0.000666
Adjusted R-squared	0.008398	S.D. dependent var		0.017567
S.E. of regression	0.017493	Akaike info criterion		-5.253397
Sum squared resid	0.918293	Schwarz criterion		-5.249396
Log likelihood	7889.975	Hannan-Quinn criter.		-5.251957
F-statistic	26.42536	Durbin-Watson stat		1.998791
Prob(F-statistic)	0.000000			
Inverted AR Roots	.09			

Source: Processed (2012)

Based on Table 5 shows that the parameter estimation of AR (1) statistically significant at $\alpha = 5\%$. AIC and SIC values is quite low compared to the estimated ARMA model of the other. F test also showed significant results at $\alpha = 1\%$.

Table 6 Estimation Results of Model Index JII, ARIMA

Dependent Variable: RETURNJII

Method: Least Squares

Date: 04/20/12 Time: 12:27

Sample (adjusted): 2 2843

Included observations: 2842 after adjustments

Convergence achieved after 6 iterations

MA Backcast: -10 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000510	0.000388	1.312307	0.1895
AR(1)	0.066140	0.018726	3.532071	0.0004
MA(12)	0.064814	0.018742	3.458156	0.0006
R-squared	0.008999	Mean dependent var		0.000509
Adjusted R-squared	0.008300	S.D. dependent var		0.018235
S.E. of regression	0.018159	Akaike info criterion		-5.178227
Sum squared resid	0.936176	Schwarz criterion		-5.171944
Log likelihood	7361.261	Hannan-Quinn criter.		-5.175961
F-statistic	12.88944	Durbin-Watson stat		1.998300
Prob(F-statistic)	0.000003			
Inverted AR Roots	.07			
Inverted MA Roots	.77-.21i	.77+.21i	.56-.56i	.56-.56i
	.21+.77i	.21-.77i	-.21+.77i	-.21-.77i
	-.56+.56i	-.56+.56i	-.77-.21i	-.77+.21i

Source : Processed (2012)

Based on Table 6 shows that the parameter estimation of AR (1) and MA (12) is statistically significant at $\alpha = 5\%$. AIC and SIC values is quite low compared to the estimated ARMA model of the other. F test also showed significant results at $\alpha = 1\%$.

HETEROSCEDASTICITY TEST

Heteroscedasticity test has an objective to identify whether error variance (residual variants) is constant (homoscedastic) or inconstant/variable (heteroscedastic). Heteroskedasticity test results on ARIMA models and JII LQ45 index can be seen in table 7 and table 8.

Table 7 Output White Heteroskedasticity return index LQ45

Heteroskedasticity Test: White

F-statistic	30.79835	Prob. F(4,2999)	0.0000
Obs*R-squared	118.5298	Prob. Chi-Square(4)	0.0000
Scaled explained SS	449.1674	Prob. Chi-Square(4)	0.0000

Source : Processed (2012)

Table 8 Output White Heteroskedasticity return index JII

Heteroskedasticity Test: White

F-statistic	2.526061	Prob. F(9,2819)	0.0070
Obs*R-squared	22.63267	Prob. Chi-Square(9)	0.0071
Scaled explained SS	101.4792	Prob. Chi-Square(9)	0.0000

Source: Processed (2012)

Based on Table 7 and Table 8 above, it can be seen that the probability of F-statistics (LQ45 and JII) is equal to 0.000000, where the probability is less than 5% (0.000000 < 5%), so it can be concluded that the data is heteroskedastis. This shows that the calculation of volatility is by using GARCH models.

MEASUREMENT OF VOLATILITY MODEL WITH GARCH**MODEL ESTIMATION WITH ARCH/GARCH**

Output of the result of estimation GARCH for index LQ45 and JII are in the tables 9 and 10.

Table 9 The Estimation Results Index LQ45, GARCH

MODEL	P=1	P=2	P=3	q=1	q=2	q=3	AIC	SIC
GARCH(1.0)	0.263810						-5.326636	-5.318634
GARCH(2.0)	0.239133	0.165705					-5.377902	-5.367900
GARCH(3.0)	0.171668	0.141609	0.189574				-5.407665	-5.395662
GARCH(1.1)	0.133061			0.815540			-5.451030	-5.441028
GARCH(1.2)	0.161931			0.518274	0.258863		-5.451019	-5.439017
GARCH(1.3)	0.157792			0.508555	0.333743	-0.060179	-5.450463	-5.436459
GARCH(2.1)	0.158636	-0.037649		0.833750			-5.450893	-5.438891
GARCH(2.2)	0.164428	-0.131824		1.487593	-0.531341		-5.451303	-5.437300
GARCH(3.1)	0.158914	-0.036751	-0.002477	0.835693			-5.450231	-5.436228
GARCH(3.2)	0.155040	0.058521	-0.003967	0.154279	0.555924		-5.449938	-5.433934
GARCH(3.3)	0.140758	0.097185	0.115947	-0.082345	0.019620	0.577623	-5.449567	-5.431563

Source : processed (2012)

In the table 9 it shows that best GARCH model for estimation of index lq45 is GARCH(2.2), because it has smallest AIC and SIC values as compared with other estimation models, where its estimation models are:

$$\sigma_t^2 = 0.000003548 + 0.164427 * e_{t-1}^2 - 0.131824 * e_{t-2}^2 + 1.48759 * \sigma_{t-1}^2 - 0.53134 * \sigma_{t-2}^2 \dots 11$$

Table 10 The Estimation Results Index JII, GARCH

MODEL	P=1	P=2	P=3	q=1	q=2	q=3	AIC	SIC
GARCH(1.0)	0.303408						-5.245619	-5.235147
GARCH(2.0)	0.255941	0.103694					-5.275120	-5.262554
GARCH(3.0)	0.196923	0.092058	0.127928				-5.290505	-5.275844
GARCH(1.1)	0.108013			0.848640			-5.340778	-5.328211
GARCH(1.2)	0.141732			0.452702	0.348864		-5.341594	-5.326933
GARCH(1.3)	0.141226			0.454028	0.353122	-0.004899	-5.340890	-5.324135
GARCH(2.1)	0.149086	-0.054393		0.867794			-5.341453	-5.326792
GARCH(2.2)	0.141439	0.001165		0.445210	0.355131		-5.340890	-5.324135
GARCH(2.3)	0.154513	-0.107842		1.147174	-0.041427	-0.170736	-5.340494	-5.321645
GARCH(3.1)	0.148523	-0.056180	0.003838	0.865620			-5.340762	-5.324007
GARCH(3.2)	0.144094	0.080933	-0.038446	-0.091682	0.825931		-5.341408	-5.322559
GARCH(3.3)	0.117404	0.118114	0.092580	-0.433676	0.164643	0.813863	-5.345288	-5.324344

Source : Processed (2012)

In the table 10 it shows that best GARCH model for estimation index JII is GARCH(1.2), because it has smallest AIC and SIC values as compared with model estimation yang lain, where its estimation models are:

$$\sigma_t^2 = 0.0000199 + 0.0141732 * e_{t-1}^2 + 0.452702 * \sigma_{t-1}^2 + 0.348864 * \sigma_{t-2}^2 \dots 12$$

ARCH-LM TEST FOR ARCH/GARCH MODEL

After obtaining the best model GARCH (pq), then the next step is to do the ARCH-LM test to evaluate the estimation results if the model still contains elements of heteroscedasticity or not. ARCH-LM test results JII LQ45 and shown in tables 11 and 12.

Table 11 ARCH-LM test for index LQ45 GARCH Model

Heteroskedasticity Test: ARCH

F-statistic	0.275682	Prob. F(1,3000)	0.5996
Obs*R-squared	0.275840	Prob. Chi-Square(1)	0.5994

Source : Processed (2012)

Table 12 ARCH-LM test for index JII GARCH MODEL

Heteroskedasticity Test: ARCH

F-statistic	0.020807	Prob. F(1,2839)	0.8853
Obs*R-squared	0.020822	Prob. Chi-Square(1)	0.8853

Source : Processed (2012)

Based on the ARCH-LM test contained in tables 4.12 and 4.13 shows that the estimated GARCH models are free from heteroscedasticity, as evidenced by the significance of > 5%.

MEASUREMENT VOLATILITY FOR INDEX LQ45 and JII

By using equations 11 and 12, the obtained value and the volatility for the index JII indexLQ45 contained in Table 13.

Table 13 Volatility of LQ45 and JII

Index	Volatility (σ)
LQ45	0.055849
JII	0.026165

Source : Proceeeded(2012)

From Table 13 above shows that the risk of LQ45 index is greater than the index due to the volatility index JII larger LQ45 index JII.

CONCLUSION

Based on the result of research it has been found that the result of stasionarity test indicating in data index LQ45 and JII, data are stationary, so it has been carried out a modeling by using ARIMA. The best ARIMA model for index LQ45 is ARIMA(1,0,12), while for index JII is ARIMA(1,0,0). But after doing diagnosis the existence of heteroscedasticity to The best ARIMA model, it has been detected that data still contain heteroscedasticity element. So in the determination of volatility, which is risk indicator of an index, it will obtained by using Autoregressive Conditional Heteroscedasticity/ Generalized Autoregressive Conditional Heteroscedastic (ARCH/GARCH) approach. The criterion of selection for the best model based on the values of AIC and SIC smallest than several model available.

The result of modeling shows that for index LQ45, the best model to model the volatility is by using GARCH(2.2) as follow: $\sigma_t^2 = 0.000003548 + 0.164427 * e_{t-1}^2 - 0.131824 * e_{t-2}^2 + 1.48759 * \sigma_{t-1}^2 - 0.53134 * \sigma_{t-2}^2$. while for index JII, the best model is by using GARCH(1.2) as follow: $\sigma_t^2 = 0.0000199 + 0.0141732 * e_{t-1}^2 + 0.452702 * \sigma_{t-1}^2 + 0.348864 * \sigma_{t-2}^2$. The value of volatility indexLQ45 is at 0.055849 and index JII is at 0.026165.

REFERENCES

- Black, F. & Scholes, M. (1973). The Pricing Option and Corporate Liabilities. *Jornal of Political Economy*, Vol.81, No.3, pp 637-654
- Bollerslev, T. (1986). Generalized Autoregressive Conditional Heteroscetasticity. *Journal of Econometrics*, Vo.31, pp.307-327.
- Duan, J.C. (1995). The GARCH Option Pricing Model. *Mathematical Finance*, Vo.5, pp.13-32.
- Engle, R.F. (1982). Autoregressive Conditional Heteroscedasticity with Estimates of the variance of U.K Inflation. *Econometrica*, Vo.50, pp.987-1008.
- Gujarati, D.N. (2003). *Asic Econometrics Fourth Edition*. USA:McGraw-Hill.
- Haruman, Tendi & Hendrawan, Riko. (2009). Pengujian Garch Option Model untuk Barrier Option di Bursa Efek Indonesia. *Jurnal Keuangan dan Perbankan*. Vol.13. No.2. Hal 228 – 236.
- Haruman, Tendi & Hendrawan, Riko. Which is better: homoskedastis or Heteroskedastis Volatility Model for Option pricing? (Test of Black-Scholes Model and GARCH Option Model at The Indonesian Stock Exchange). *The 8th Asian Academy of Management International Conference*.
- Heston, L.S & Nandi, S. (2000). A-Closed-Form GARCH Option Pricing Model. *Review Financial Studies*, Vol.13, pp.585-626.
- Hull, J.C. (2003). *Option, Futures, and Other Derivatives, Fifth Edition*. Prentice Hall.
- Santoso, Teguh. (2011). Aplikasi Model GARCH pada Data Inflasi Bahan Makanan Indonesia Periode 2005.1 – 2010.6. *Jurnal Organisasi dan Manajemen*, Volume 7, No.1, 38-52.