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GRANGER-CAUSE EFFECT ON TRADING VOLUME AND STOCK RETURN VOLATILITY: EVIDENCE FROM ACE MARKET MALAYSIA

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GRANGER-CAUSE EFFECT ON TRADING VOLUME AND STOCK RETURN VOLATILITY: EVIDENCE FROM MALAYSIAN ACE MARKET

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Pusat Pengajian Ekonomi, Kewangan dan Perbankan
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LIST OF ABBREVIATIONS

R	Return
V	Volume
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
VDC	Variance Decomposition
IRF	Impulse Response Function
EMH	Efficient Market Hypothesis

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ABSTRACT

This study analyzes the relationship between trading volume and stock return in Malaysian ACE market for the period of August, 2009 to December, 2015. Several tests were utilized; multivariate time series regression model; Brailsford model; VAR analysis, and; Granger-cause test. The empirical result proves a significant positive contemporaneous relationship between trading volume and stock return and *vice versa*. However, trading volume has negative significant relationship with stock return volatility, thus exhibits an asymmetry relationship between the variables. VAR analysis reveals that past trading volume has explanatory power in forecasting stock return and *vice versa*. And lastly, Granger-causality test indicates a significant bi-directional relationship between trading volume and stock return. Thus, it is proven that Malaysian ACE market is contradicted with the weak-form of efficient market hypothesis.

Keywords: trading volume, stock return, vector autoregressive model, Granger-causality test, Malaysian ACE market

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ABSTRAK

Kajian ini menganalisa hubungan antara jumlah dagangan dan pulangan saham di pasaran ACE Malaysia bermula dari Ogos 2009 hingga Disember 2015. Beberapa ujian telah dijalankan diantaranya ialah model regresi siri masa multivariat; model Brailsford; analisis VAR, dan; ujian sebab-akibat Granger. Hasil empirikal membuktikan terdapat hubungan semasa yang positif dan signifikan antara jumlah dagangan dan pulangan saham dan sebaliknya. Walau bagaimanapun, jumlah dagangan mempunyai hubungan negatif yang signifikan dengan turun naik pulangan saham, sekali gus mempamerkan hubungan asimetri antara pembolehubah yang terlibat. Analisis VAR mendedahkan bahawa jumlah dagangan lalu mempunyai kuasa penjelasan dalam ramalan pulangan saham dan sebaliknya. Dan yang terakhir, ujian Granger sebab-akibat menunjukkan hubungan signifikan dua hala antara jumlah dagangan dan pulangan saham. Oleh itu, objektif pertama dan kedua telah dicapai. Oleh itu, terbukti bahawa pasaran ACE Malaysia adalah bercanggah dengan teori *weak-form* mengikut hipotesis pasaran cekap.

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Kata kunci: pulangan saham, jumlah dagangan, model autoregresif vektor, ujian Granger-sebab akibat, pasaran ACE Malaysia

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Economists believe that eighty percent of stock markets would crash to strike in 2016 due to the slowdown in global economic, flatten in the earnings, collapse of commodities prices, and tighten in monetary policy by Federal Reserve (The Sovereign Investor, 2016, February 18). These are the critical indicators that express the stock markets in 2016 are anticipate to bearish. Rapidly growing emerging stock markets such as Malaysian stock market would be most largely impacted. Emerging stock markets associate with highly volatility stock return due to low stock market volume (Attari, Rafiq and Awan, 2012; Hseih, 2014). A study in developed versus emerging stock markets has revealed a negative relationship between predictable volume and stock return volatility in some emerging markets, which is related to the inefficiency in the markets (Girard and Biswas, 2007).

Stock price or stock return volatility refers to a drastic change (increase or decrease) in value by a given stock within a given period. The drastic change in stock price usually occurs due to an imbalance in trade volume for a particular stock. For example, a stock price will go up sharply when the stock is traded in large quantities (Mohamad and M.D Nassir, 1995), but if short selling is practiced

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REFERENCES

Admati, R. A., & Pfleiderer, P. (1988). A Theory of Intraday Patterns: Volume and Price Variability. *The Review of Financial Studies, 1(1), 3-40.*

Ahmed, H. J. A., Hassan, A., & Nassir, M. D. A. (2005). The Relationship between Trading Volume, Volatility and Stock Market Returns: A test of Mixed Distribution Hypothesis for A Pre- and Post-Crisis on Kuala Lumpur Stock Exchange. *Investment Management and Financial Innovations, 3, 146-157.*

Ajayi, R. A., Mehdian, S., & Mougoue, M. (2006). The Empirical Relation between Price Changes and Trading Volumes: Further Evidence from European Stock Markets.

Al-Samman, H., & Al-Jafari, M. K. (2015). Trading volume and Stock Return Volatility: Evidence from Industrial Firms of Oman. *Asian Social Science, 11(24), 139-145.*

Al-Jafari, M. K., & Tliti, M. (2013). An empirical investigation of the relationship between stock return and trading volume: Evidence from the Jordanian banking sector. *Journal of Applied Finance & Banking*, *3*(3), 45-64.

Al-Saad, K. (2004). Asymmetry in the price-volume relationship: Evidence from the Kuwait stock market. *Journal of Accounting and Finance, 3, 53-56.*

Universiti Utara Malaysia

Al-Saad, K., & Moosa I. A. (2008). Asymmetry in the price-volume relation: Evidence based on individual company stocks traded in an emerging stock market. *Applied Financial Economics Letters, 4(2), 151-158.*

Attari, M. I. J, Rafiq, S., & Awan, H. M. (2012). The dynamic relationship between stock volatility and trading volume. *Asian Economic Financial Review, 2(8), 1085-1097.*

Brailsford, T. J. (1996). The empirical relationship between trading volume, returns, and volatility. *Accounting & Finance, 36(1), 89-111.*

Carl, B. McGowan., & Muhammad, J. (1997). Bid-Ask Spreads, Trading Volume and Volatility: Intra-Day Evidence from London Stock Exchange. *Journal of Business Finance and Accounting, 24(3) & (4), 343-362.*

Carl, B. McGowan., & Muhammad, J. (2011). The price-volume relationship of the Malaysian Stock Index futures market. *Journal of Finance and Accountancy.*

Carl, B. McGowan., & Muhammad, J. (2012). The Relationship Between Price And Volume For The Russian Trading System. *International Business & Economics Research Journal, 11(9), 963-970.*

Chandra, A. (2012). Cause and effect between FII trading behaviour and stock market returns. *Journal of Indian Business Research, 4(4), 286 – 300.*

Universiti Utara Malaysia

Choi, K-H., Jiang, Z-H., Kang, S. H., & Yoon, S-M. (2012). Relationship between Trading Volume and Asymmetric Volatility in the Korean Stock Market. *Modern Economy, 3, 584-589.*

Chen, C., & Zhou, Z.G. (2001). Stock Returns, Volatility, and Trading Volume: Evidence from the Chinese Stock Markets. *International Journal of Business, 6(2), 68-85.*

Chen, G., Firth, M., & Rui, O. (2001). The dynamic relation between stock returns, trading volume, and volatility. *The Financial Review, 36(3), 153-174.*

Christiana, A.M., Septiana, E., & Mamduch. (2016). The Empirical Relationship between Stock Return and Trading Volume based on Stock Market Cycles. *Indonesian Capital Market Review, 8, 46-57.*

Chuang, W-I., Liu, H-H., & Susmel, R. (2012). The bivariate GARCH approach to investigating the relation between stock returns, trading volume, and return volatility. *Global Finance Journal, 23, 1-15.*

Crouch, R. L. (1970a). A nonlinear test of the random walk hypothesis. *American Economic Review, 60(1), 199-202.*

Crouch, R. L. (1970b). The volume of transactions and price changes on the New York Stock Exchange. *Financial Analysts Journal, 26(4), 104-109.*

Universiti Utara Malaysia

Dan, L., Yuan, Z., & Zhong, W. (2013). The Dynamic Relationship Among Return, Volatility and Trading Volume in China Stock Market - An Empirical Study Based on Quantile Regression. *Management & Engineering, 12, 41-49.*

Darwish, M. J. (2012). Testing the Contemporaneous and Causal Relationship between Trading Volume and Return in the *Palestine Exchange. Interdisciplinary journal of contemporary research in business 3(10), 55-62.*

Datar, V. T., Naik, N., & Radcliffe, R. (1998). Liquidity and stock returns: An alternative test. *Journal of Financial Markets, 1(2), 203-219.*

De Madeiros, O.R., & Van Doornik Bernandus, F.N., (2006). The Empirical Relationship between Stock Returns, Return Volatility and Trading Volume in the Brazilian Stock Market. *Social Sciences Research Network.*

Dickey, D. A., and Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of American Statistical Association, 74, 427-431.*

Eaves, J., & Valero, M. (2009). Differences in opinions and the volatility-volume relationship on the Tokyo Grain Exchange. *Agricultural Finance Review, 69(2), 180-195.*

Emenike, K. O., Chinwe, O. C. (2014). The Relationship between Stock Returns Volatility and Trading Volume in Nigeria. *Verslo Sistemos Ir Ekonomika Business Systems and Economics, 4 (2), 115-125.*

Universiti Utara Malaysia

Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *Journal of Finance, 25(2), 383-417.*

Frederick (Fengming), S., Tan, H., & Wu, Y. (2005). Trade size, trade frequency, and the volatility volume relation. *The Journal of Risk Finance, 6(5), 424 – 437.*

Girard, E., & Biswas, R. (2007). Trading Volume and Market Volatility: Developed versus Emerging Stock Markets. *The Financial Review 42, 429-459.*

Girard, E., & Omran, M. (2009). On the relationship between trading volume and stock price volatility in CASE. *International Journal of Managerial Finance, 5(1), 110 – 134.*

Godfrey, M.D., Granger, W. J., & Morgenstern, O. (1964). The random-walk hypothesis of stock market behavior. *International Review for Social Science, 17(1), 1-30.*

Grammatikos, T., & Saunders, A. (1986). Futures price variability: A test of maturity and volume effects. *Journal of Business, 59(2), 319-330.*

Granger, C. W., & Morgenstern, O. (1963). Spectral analysis of New York stock market prices. *Kyklos, 16(1), 1-27.*

Habib, N. M. (2011). Trade Volume and Returns in Emerging Stock Markets An Empirical Study: The Egyptian Market. *International Journal of Humanities and Social Science, 1(19), 302-312.*

Heryán, T. (2013). Stock price volatility and trading volume: Evidence from selected world financial companies' shares.

Universiti Utara Malaysia

Hseih, H.-C., S. (2014). The causal relationship between stock returns, trading volume and volatility. *International Journal of Managerial Finance, 10(2), 218-240.*

Jain, P. C., & Joh, G. (1986). The dependence between hourly prices and trading volume. *The Journal of Financial and Quantitative Analysis, 23(3), 269-283.*

Kamath R., & Wang, Y. (2006). The causality between stock index returns and volumes in the Asian equity markets. *Journal of International Business Research, 5, 63-74.*

Karpoff, J. M. (1987). The Relation between Price Changes and Trading Volume: A Survey. *Journal of Financial and Quantitative Analysis, 22(1), 109-125.*

Karanasosa, M., & Kyrtsou, C. (2011). Analyzing the link between stock volatility and volume by a Mackey-Glass GARCH-type model: the case of Korea.

Kumar, B., Singh, P., & Pandey, A. (2009). The Dynamic Relationship between Price and Trading Volume: Evidence from Indian Stock Market. *Social Science Research Network.*

Lau, W.-Y., & Go, Y.-H. (2012). Information flow between return and trading volume in Malaysian futures market. *African Journal of Business Management, 6 (32), 9326-9334.*

Lee, B.-S., & Rui, O. (2002). The dynamic relationship between stock return and trading volume: Domestic and cross-country evidence. *Journal of Banking and Finance, 26(1), 51-78.*

Universiti Utara Malaysia

Lee, C., & Rui, O. M. (2000). Does trading volume contain information to predict stock returns? Evidence from China's stock markets. *Review of Quantitative Finance and Accounting, 14(4), 341-360.*

Léon, N. (2007). An empirical study of the relation between stock return volatility and trading volume in the BRVM. *African Journal of Business Management, 1(7), 176- 184.*

Mahajan, S. & Singh, B. (2009). The empirical investigation of relationship between return, volume, and volatility dynamics in Indian stock market. *Eurasian Journal of Business and Economics, 2(4), 113-137.*

Mestal, R., Gurgul, H., & Majdosz, P. (2003). The Empirical Relationship between Stock Returns, Return Volatility and Trading volume on the Austrian Stock Market.

Mohd, A.H.S., Cheong, C.W., & Isa, Z. (2010). A Structural Return-Volatility-Volume Analysis of Malaysian Stock Market. *International Review of Applied Financial Issues and Economics, 2(3), 447-460.*

Mohamad, S., & Nassir, M.D.A. (1995). Price Changes and Trading Volume Relationship: Some Preliminary Evidence from Kuala Lumpur Stock Exchange. *Pertanika J. Soc. Sci. & Hum., 3(2), 147-154.*

Moosa, I. A., & Jader, S. A. (2006). Is The Price-Volume Relation Asymmetric? Cross Sectional Evidence from an Emerging Stock Market. *Investment Management and Financial Innovations, 3(3), 80-90.*

Universiti Utara Malaysia

Mubarik, F., & Javid, Y. A. (2009). Relationship between stock return, trading volume and volatility: Evidence from Pakistani stock market. *Asia Pacific Journal of Finance and Banking Research, 3(3), 1-17.*

Oral, E. (2012). An empirical analysis of trading volume and return volatility relationship on Istanbul stock exchange national -100 Index. *Journal of Applied Finance & Banking, 2(5), 149-158.*

Pathirawasam, C. (2011). The relationship between trading volume and stock returns. *Journal of Competiveness, 3, 41-49.*

Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika, 75(2), 335-346.*

Pisedtasalasai, A., & Gunasekarage, A. (2007). Causal and dynamic relationships among stock returns, return volatility and trading volume: Evidence from emerging markets in South-East Asia. *Asia-Pacific Finance Markets, 14(4), 277-297.*

Poon, S., & Granger, C.W. (2003). Forecasting Volatility in Financial Markets: A Review. *Journal of Economic Literature 41(2), 478-539.*

Rogalski, R. J. (1978). The dependence of prices and volume. *The Review of Economics and Statistics, 60(2), 268-274.*

Rutledge, D. J. S. (1984). Trading volume and price variability: New evidence on the price effects of speculation, in selected writings on futures markets: Research directions in commodity markets Chicago. *Chicago Board of Trade, 237-251.*

Universiti Utara Malaysia

Saatcioglu, K., & Starks, L. T. (1998). The stock price–volume relationship in emerging stock markets: The case of Latin America. *International Journal of Forecasting, 14(2), 215-225.*

Sabri, N. (2008). The impact of trading volume on stock price volatility in the Arab economy. *Journal of Derivatives & Hedge Funds, 14(3-4), 285-298.*

Smirlock, M., & Starks, L. (1985). A further examination of stock price changes and transactions volume. *Journal of Financial Research, 8(3), 217-225.*

Song, F. (Fengming), Tan, H., & Wu, Y. (2005). Trade size, trade frequency, and the volatility volume relation. *The Journal of Risk Finance, 6(5), 424 – 437.*

Sun, M. Y., & Li, J. F. (2015). A simultaneous equations model of returns, volatility, and volume with intraday trading dynamics. *Accounting and Finance Research, 4(2), 50-59.*

Tauchen, G., & Pitts, M. (1983). The price variability-volume relationship on speculative markets. *Econometrica, 51(2), 485-505.*

Tripathy, N. (2011). The relation between price changes and trading volume: A study in Indian stock market. *Interdisciplinary Journal of Research in Business, 1(7), 81-95.*

Universiti Utara Malaysia

Westerfield, R. (1977). The distribution of common stock price changes: An application of transactions time and subordinated stochastic models. *The Journal of Financial and Quantitative Analysis, 12(5), 743-765.*

Ying, C. C. (1966). Stock market prices and volumes of sales. *Econometrica, 34(3), 676-686.*

http://www.bursamalaysia.com/market/

http://finance.yahoo.com/market-overview/

http://thesovereigninvestor.com/*exclusive/80-stock-market-crash-to-strike-in-2016/*

http://www.thestar.com.my/*business/business-news/2015/07/14/bursa-enhances-acemarket rules/*

http://www.smeinfo.com.my/*index.php?option=com_content&view=article&id=1148&Itemid=1156*

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