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## Efficiency and Volatility of the Stock Market in Bangladesh: A Macroeconometric Analysis

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**Abstract.** This study investigates the weak form efficiency of Efficient Market Hypothesis (EMH) employing Autocorrelation test, Runs test and Unit Root tests, and the nature of volatility characteristics of stock returns applying GARCH family models in Bangladesh stock market using daily all share price index return data of Dhaka Stock Exchange (DSE) from 02 January 1993 to 27 January 2013. This study also examines the semi-strong form of the EMH of DSE based on macroeconomic variable version of the Arbitrage Pricing Theory (APT) applying Cointegration tests, Vector Error Correction Model (VECM) and Granger causality tests, and the volatility of the DSE returns in response to the volatility of the macroeconomic variables employing GARCH family models using monthly data from January 2001 to December 2012. In addition, the short run and long run relationships between macroeconomic variables and aggregate stock prices in Bangladesh have also been determined. Employing both nonparametric tests (Runs test and Phillips-Perron test) and parametric tests (Autocorrelation test and Augmented Dickey–fuller test), this study finds that the DSE of Bangladesh is not weak form efficient. Taking the outcome of VAR models into account, it is found that all selected macroeconomic variables do significantly explain the stock prices of the Bangladesh stock market. As a consequence, it may be concluded that the Bangladesh stock market is not efficient in the semi-strong form of EMH. Results of the estimated MA(1)-GARCH(1,1) and MA(1)-EGARCH(1,1) models reveal that stock market returns of Bangladesh exhibit leptokurtosis, volatility clustering and leverage effect. Results of six GARCH-S models indicate that the volatility of DSE return is significantly influenced by the volatility of macroeconomic variables, such as, exchange rate, broad money supply and stock returns of India.

**Keywords.** Efficient market hypothesis, Stock prices, Vector error correction model, GARCH family models, Volatility.

**JEL.** C58, E44, F36, G10, G14.

### Highlights

- \* The role of economic factors and past stock price patterns on the stock prices has been subjected to economic research all over the world. Although, study like efficiency and volatility of the stock market in Bangladesh in response of macroeconomic variables has basically been ignored.
- \* This study takes an attempt to uncover the issue of efficiency and volatility of the stock market in Bangladesh by employing both univariate models using daily past share prices data and multivariate models employing monthly data of macroeconomic variables and stock index.
- \* This research concludes that the stock market of Bangladesh is not efficient in weak and semi-strong form of EMH. Stock market returns of Bangladesh exhibit well-known stylized facts. The volatility of DSE return is significantly influenced by the volatility of macroeconomic variables.

<sup>†</sup> This summary depends on the PhD thesis which was submitted to Institute of Bangladesh Studies (IBS) on November 2015, under the supervision of Professor Dr. Md. Abdul Wadud, Department of Economics, University of Rajshahi, Bangladesh. The original language is English and the thesis is consisted of 245 pages.

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### Summary

Efficiency and volatility have been the most active and successful area of research in time series econometrics and finance in past three decades. The efficient markets theory assumes that stock prices reflect all available information like past stock price patterns, company and economy fundamentals. Therefore, prediction on future stock prices should be a worthless task in an efficient stock market by looking at past price patterns, company and economy fundamentals. Theoretically, the stock market should be closely related to real economic variables of the country. If the connection between stock prices and micro-macroeconomic variables exists, the stock market of Bangladesh loses its informational efficiency and becomes more volatile. Bangladesh has two stock exchanges: Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE). DSE is the oldest and largest stock exchange in Bangladesh. The stock market of Bangladesh has progressed accompanied by the overall economy after the process of liberalization in early 1990s. Stock markets of Bangladesh are relatively new compared to other emerging countries; however it obtains an immense focus by policymakers, investors, academicians, and even general citizens. Taking into consideration the facts, the study aims to explore the behavior of the Bangladesh stock market.

The rising importance of stock markets globalization has increased the interest in emerging markets. Consequently, researchers have focused research on whether or not these markets are efficient. The stock market of Bangladesh has been growing notably for the past two and half decades. Thus, measuring the efficiency of stock market is an important research topic as this contains various implications for investors. Moreover, the stock market crashes enlighten that it is important to protect the stock market from drastic fluctuations. Thus, analyzing the volatility of stock returns is an informative examination as it bears several indications for investors and policymakers. Hence, this research is designed to macroeconomically investigate the efficiency and volatility of stock market in Bangladesh. In this context, this study deals with the following specific objectives: i) To investigate the efficiency of the stock market in Bangladesh; ii) To examine the short run dynamics and long run equilibrium links between economic variables and stock prices; iii) To explore the causal relationships and direction of the causality between stock index and macro economic variables; iv) To assess the volatility characteristics of stock returns; v) To investigate the volatility of stockmarket returns in response to the volatility of the macroeconomic variables.

In view of the facts that this study involves in studying the efficiency and volatility in the Bangladesh stock market, it is essential as well as meaningful to present some relevant aspects about the Bangladesh economy, her stock markets and changes that have taken place within it since the country became independent. For that reason, we state some facts on the performance of the Bangladesh economy, and thereafter the overview of the financial system of Bangladesh. Subsequently, it presents a historical review of the development stages of the Bangladesh stock market since its inception in 1954. A statistical review of the performance of the stock market and the status of DSE in the world stock market perspective are also provided. With an inherited fragile economy after independence in 1971, Bangladesh has categorized as a poor economy and branded as a natural disaster inflated, famine, and devastating economy in the world. Bangladesh has taken more than twenty years to disprove the statement as she witnessed decades of slow economic growth until 1990s. The performance of Bangladesh economy over the last one and half decades has been quite impressive. The country has posted an average annual GDP growth rate of about 4% in the 1970-80s, which improved to 5% in the 1990s. During the first decade of the 21<sup>st</sup> century, the average economic growth rate has been approached 6% per annum. That is why, The World Bank has signposted on its website that: ‘ Bangladesh has sustained an impressive track record for growth and development. In the past decade, the economy has grown at nearly 6 % per year despite frequent natural

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disasters and fuel, food price and global financial crises. In the past two decades, poverty was reduced by nearly one-third whereas life expectancy, literacy and per capita food production have increased significantly' (World Bank, 2013, para. 1). Currently, Bangladesh is the 31<sup>th</sup> largest economy in the world in terms of purchasing power parity (Sohel, 2015). Bangladesh is practically self-sufficient in food and is a major exporter of garments, leather, ceramics and pharmaceuticals. Bangladesh is now recognized as an emerging economy and frequently captured by reputed international organizations and media. The major findings from the overview of the DSE may be summarized as follows. The total number of enlisted securities is increasing at a handsome rate, although there is a shortage of healthy fundamental companies in terms of the greater demand over supply of companies share as BO accounts is increased from 3 lacs in 1996 to 35 lacs in 2010. The DSE is not succeeding to become a capital market as it is still an equity based market. The stock market indicators like market size is increasing impressively since more than last two decades; however the market size of Bangladesh stands at only around 30%. Market concentration is extreme as Grameenphone holds 16.58% of total market capitalization of the DSE as of December 2009. Foreign portfolio investment makes only around 2% of total investment at DSE, which is the lowest in South Asia region. From the commencement, Dhaka Stock Exchange has faced two major market crashes in November 1996 and December 2010. During the crash of 1996, paper shares used to be sold in front of DSE and it was not easy for amateur investors to classify which one is profitable share and which one is fake printed share. In spite of automated share trading, strong surveillance and circuit breakers contrasting formerly in 1996, DSE is strongly affected by the 2nd market crash in 2010-11. Based on the contemporary investigations of the capital market crashes, various malfunctions and drawbacks are observed like, misuse of book building methods, placement shares, direct listing, problems in audit reports, split shares, margin loans, serial trading, issue of right shares, over exposures of banks, omnibus accounts, insider trading, anomalies in BO account, and hampering nexus of big players like the SEC, DSE, CSE and political leaders.

We also provide a theoretical overview of asset pricing theory. We start with EMH and find evidences in the literature in favor of weak form of EMH and semi-strong form of EMH particularly in developed markets. Then we review the Markowitz portfolio theory and find some strong evidences that the Markowitz optimal portfolio does provide the basis of a useful trading rule strategy. We also outline the Capital Asset Pricing model and Arbitrage Pricing Theory. APT has been tested intensively since its introduction in 1976. Although empirical studies have suggested that APT macroeconomic variables can explain stock returns, it does not specify the number of variables that should be included in the multivariate efficiency and volatility models, and they are also disappointed to identify a definite guideline for choosing an appropriate set of macroeconomic variables. Finally, the present value model has been explained. Although, the extended version of PVM allows to identify macroeconomic variables that should impact corporate cash flows and discount rates, the linear PVM mainly focuses on the relationship between real stock prices and dividends. Since this research is aimed to macroeconomically investigate the efficiency and volatility of stock market in Bangladesh, we have come to a decision to follow the EMH and APT. We have reviewed the studies that satisfy the following three conditions: i) the issue of stock market efficiency; ii) the relationship between stock prices and macroeconomic variables; and iii) the issue of stock market volatility. Few studies around the world have been conducted to test both the efficiency and volatility of the stock market. Most of scholars have used only historical data of stock index to test efficiency and volatility. The efficiency and volatility test using a top down approach has basically been overlooked. This study tries to fill the gap in the literature as it attempts to explore the efficiency and volatility of DSE by using both univariate and multivariate time series models.

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This research tests the weak form efficiency of EMH in the framework of the random walk model using daily all share price index (DSI) return data of Dhaka Stock Exchange from 02 January 1993 to 27 January 2013. Results suggest that DSE of Bangladesh is not efficient in weak form for the whole period. Different tests have been employed to investigate whether past returns of stock indices predict future returns. The following results are obtained:

- The statistical features of the daily DSI return data indicate that the daily distribution of stock market returns is not normally distributed and thus it deviates from the prior condition of the random walk model.
- The serial autocorrelation tests for level and first differences show that the DSE is not weak form efficient as there is highly significant autocorrelation for all lags at the 1% level for the returns of DSI.
- The results of the runs test for DSI return series report that the Z-statistics of the runs test of serial independence is significant at the 1% level. So, the significant positive serial correlation in the return series shows that the Dhaka Stock Exchange does not follow random walk.
- The results of ADF and PP unit root tests reveal that the null hypothesis of unit root is strongly rejected at 1% significant level. Thus the unit root tests suggest that the market is not weak form efficient.

Efficiency tests for the semi-strong form of the EMH have been performed jointly with an equilibrium asset pricing model named ‘macroeconomic variable version APT’ using monthly data from January 2001 to December 2012. In the avenue of exploring semi-strong form of EMH, the research reveals the long run and short run relationship with causality between stock prices and macroeconomic variables. Wide ranges of VAR models including the Johansen and Juselius multivariate cointegration test, vector error correction model, Granger causality tests are applied. Summary obtained from the above models are given as follows:

- On the basis of the graphical depictions and results of unit root tests, we conclude that the null hypothesis of unit root at the level are accepted for the variables. ADF and PP tests provide that all series are stationary in first differences at 1% level of significance, while only M2 is stationary in first differences at 5% level of significance.
- We operate five different criteria to find out the optimum lag lengths of the VAR model. Results for each criterion with a maximum of 12 lags reveal that AIC, sequential modified LR and FPE criteria propose for 12 lags, 10 lags and 2 lags respectively, while SIC and HQ criteria suggest for only 1 lag. Residual serial correlation Lagrange Multiplier test shows that 10 lags suggested by sequential modified LR criteria produces no autocorrelation in the VAR model for up to 12 months. Hence, we take on VAR (10) model for cointegrating analysis.
- Johansen and Juselius (1990) multivariate cointegration test is applied to investigate the long run relationship between macroeconomic variables and the stock prices of Bangladesh. Results reveal that industrial production index (IPI) and crude oil price (OP) have significant negative long run relationship with all share price index (DSI) of DSE, while money supply (MS), exchange rate (ER), and Indian stock prices (SENSEX) have significant positive long run relationship with all share price index of DSE. Provided that the call money rate (CMR) does not significantly contribute to the long run relationship, we drop CMR from the model and the cointegration test is reestimated. Result implies that a 1% increase in IPI and OP contributes 15.45% and 0.94% decrease in DSI respectively, while a 1% increase in M2, ER and SENSEX contributes 8.06%, 6.75% and 0.86% increase in DSI respectively.
- We apply Vector Error Correction Model (VECM) to investigate the long run causality and short run to long run dynamic adjustment of a system of the six cointegrated variables. Result shows that there is a long run causality running from the explanatory variables (IPI, M2, OP, ER, and SENSEX) to the

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dependent variable (DSI). Results of the estimated multivariate VECM also show that there is bi-directional long run causality between DSI and IPI, DSI and ER, DSI and OP in Bangladesh. The negative and significant error correction term of first differenced DSI implies that the stock index of Dhaka Stock Exchange requires about six and half months to converge into equilibrium after being shocked. Thus, about 15% of the last month's disequilibrium is corrected this month. The VECM results also show that DSI and IPI contribute to adjust any disequilibrium, while DSI picks up the disequilibrium quickly and guides the variables of the system back to equilibrium.

- Short run causality between all share price index of DSE and macroeconomic variables (IPI, M2, OP, ER and SENSEX) is revealed with a test on the individual and joint significance of the lagged explanatory variables employing VECM Granger causality/block exogeneity Wald tests. VECM Granger causality/block exogeneity Wald tests show that there is a significant short run Granger causality running jointly from IPI, M2, OP, ER, and SENSEX to DSI. The test also reveals that individually IPI and SENSEX are the leading indicators with respect to stock prices in Bangladesh in the short run. Furthermore, stock price index of DSE is a leading indicator with respect to IPI and ER in the short run.
- We operate pairwise Granger (1969) causality test between DSI and CMR, since they are not cointegrated based on Johansen cointegration test. The Granger causality test results reveal that there is a unidirectional short run Granger causality running from CMR to stock prices of DSE at 1% level of significance.

Considering the results of Johansen cointegration test, VECM, block exogeneity Wald test and Granger causality test, it is apparent that all of the selected macroeconomic variables do significantly explain the stock prices of Bangladesh stock market either in the short run or long run or both. Since macroeconomic variables information are not inherent in current share prices in the stock market of Bangladesh, it can be concluded that the Bangladesh stock market is not efficient in semi-strong form.

This research assesses the volatility characteristics of stock returns using daily closing stock price returns named DSI returns over a span of 20 years from 02 January 1993 to 27 January 2013 with a total of 4823 daily return observations. A symmetric MA(1)-GARCH(1,1) model and an asymmetric MA(1)-EGARCH(1,1) model suggest the following results.

- The ADF and PP test results expose that the null hypothesis of unit root is strongly rejected at 1% significance level. It specifies that the return series is stationary in level. Positive excess kurtosis of 257.593 of DSI return series indicates that distribution is leptokurtic that is a well-known stylized fact in the finance literature. The p-value associated with Jarque-Bera statistics show that the daily distribution of stock market returns is not normally distributed.
- Volatility clustering is another well-known stylized fact that is also viewed in DSI return series. This volatility clustering nature of DSI returns is confirmed employing the autocorrelation test that shows that there is highly significant autocorrelation for all lags from lag 1 up to lags 30 at the 1% level of significance on the basis of the Ljung-Box Q statistics. This is seen as evidence for the presence of ARCH effect or volatility clustering. Given that the DSI returns are correlated and not normally distributed, we go along with GARCH process to model our time series.
- An appropriate mean equation sets up as MA(1) from 36 combinations of Autoregressive Moving Average (ARMA) using Box Jenkins methodology. Additionally, MA (1) model produces residuals and squared residuals that are free from serial correlation. The ARCH-LM test presents that the estimated residuals exhibit autoregressive heteroskedasticity (ARCH effect). Thus, we proceed a symmetric MA(1)-GARCH(1,1) model and an asymmetric MA(1)-



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EGARCH(1,1) model to estimate the level of volatility prevailing in the Bangladesh stock market.

- Results of the estimated MA(1)-GARCH(1,1) model reveal that coefficient of MA(1) in the mean equation is significant at 1% significance level and more importantly, the parameters in the variance equation ( $\omega$ ,  $\alpha$  and  $\beta$ ) hold the expected positive signs and are significant at 1% level. Results also uncover that the stock market of Bangladesh captures volatility clustering. The sum of the ARCH and GARCH coefficients is less than one, i.e.,  $\alpha + \beta = 0.60$ , and not very close to one means that the volatility of Bangladesh stock market is moderately persistent. Results of the model show that  $\alpha$  is lower than  $\beta$ , which implies that the volatility of the stock market is affected by past volatility more than by related news from the past period.
- Results of the estimated MA(1)-EGARCH(1,1) model show that all the parameters of the mean and variance equations are highly significant at 1% level that is a strong indication for leverage effect. The model also explores that the asymmetry term  $\gamma$  is negative and highly significant meaning that negative shock has a greater impact on volatility rather than the positive shocks of the same magnitude. This implies that the volatility spillover mechanism is asymmetric in Bangladesh stock market.

We conduct six GARCH-S(1,1) models with the purpose of estimating the volatility of the macroeconomic variables on stock returns volatility in Bangladesh using monthly data of the variables from January 2001 to December 2012. The extended version of GARCH-M model named, GARCH-S model has the ability to examine the impact of individual macroeconomic variable on the stock market returns volatility. Six GARCH-S (1,1) models suggest the following results.

- The results of six GARCH-S models indicate that including one exogenous macroeconomic variable such as  $\Delta IPI$  or  $\Delta OP$  or  $\Delta SENSEX$  in the variance equation produces significant ARCH and GARCH parameters, while including  $\Delta ER$  produces only significant GARCH parameter. Although, the sum of  $\alpha$  and  $\beta$  is less than one in all of the models, the time-varying volatility of the DSE returns is highly persistent including  $\Delta IPI$  or  $\Delta OP$  in the variance equation.
- Regarding the impact of economic news, the  $\lambda$  associated with  $\Delta IPI$  or  $\Delta CMR$  or  $\Delta OP$  does not explain the volatility of the Bangladesh stock market. Hence, the growth of industrial production index ( $\Delta IPI$ ), changes in the interest rate ( $\Delta CMR$ ) and crude oil price ( $\Delta OP$ ) have no significant impact on the volatility of the stock market returns.
- There is a significant positive relationship between changes in exchange rate ( $\Delta ER$ ) and the volatility of DSE returns. This result indicates that the volatility of the Bangladesh stock market returns is expected to increase by 21% with an increase in the exchange rate of 1%.
- Results also reveal that there is a significant negative relationship between the growth of the broad money supply ( $\Delta M2$ ) and the volatility of Dhaka stock exchange returns. This implies that the volatility of the Bangladesh stock market returns is expected to decrease by 20% with an increase in the broad money supply of 1%.
- Finally, we find that there is significant negative relationship between the volatility of Indian stock market ( $\Delta SENSEX$ ) and the volatility of Dhaka stock exchange returns indicating that the volatility of the Bangladesh stock market returns is expected to dampen down by 3% by an increase in the volatility of Indian stock market of 1%. Thus, the volatility spillover effect appears between Indian and Bangladesh stock market.

## References

- Abbas, Q, Khan, S & Shah, SZA 2013, 'Volatility transmission in regional Asian stock markets', *Emerging Markets Review*, vol. 16, pp. 66–77, doi:10.1016/j.ememar.2013.04.004
- Adaramola, AO 2011, 'The impact of macroeconomic indicators on stock prices in Nigeria', *Developing Country Studies*, vol. 1, no. 2, pp. 1-14.
- Adu, G, Marbuah, G, Mensah, JT & Frimpong, PB 2013, *Macroeconomic development and stock market performance: a non-parametric approach*, EERI Research Paper Series No 01/2013.
- Afzal, N & Hossain, SS 2010, 'An empirical analysis of the relationship between macroeconomic variables and stock prices in Bangladesh', *Bangladesh Development Studies*, vol. xxxiv, no. 4, pp. 95-105.
- Agung, IGN 2009, *Time series data analysis using eviews*, John Wiley & Sons (Asia) Pte Ltd, Singapore.
- Ahmed, AD, & Mmolainyane, KK, 2014, 'Financial integration, capital market development and economic performance: empirical evidence from Botswana', *Economic Modelling*, vol. 42, pp. 1–14, doi:10.1016/j.econmod.2014.05.040
- Ahmed, HU & Samad, QA 2008, 'Performance level of Dhaka stock market: a quantitative analysis', *Daffodil International University Journal of Business and Economics*, vol.3, no. 1, pp. 1-21.
- Ahmed, MN & Imam, MO 2007, 'Macroeconomic factors and Bangladesh stock market: impact analysis through co integration approach', *International Review of Business Research Papers*, vol. 3, no. 5, pp. 21-35.
- Ahmed, S, & Zlate, A2014, 'Capital flows to emerging market economies: a brave new world?', *Journal of International Money and Finance*, vol. 48, pp. 221–248, doi:10.1016/j.jimonfin.2014.05.015
- Alexander, C 2001, *Market models: a guide to financial data analysis*, John Wiley & Sons Ltd, New York.
- Alharbi, AMH 2009, Nonlinearity and market efficiency in GCC stock markets, doctoral thesis, University of Kansas, USA.
- Ali, I, Rehman, KU, Yilmaz, AK, Khan, MA & Afzal, H 2010, 'Causal relationship between macro-economic indicators and stock exchange prices in Pakistan', *African Journal of Business Management*, vol. 4, no. 3, pp. 312-319.
- Ali, MB 2011a, 'Stock prices and microeconomic variables: T-Y granger causal evidence from Dhaka stock exchange (DSE)', *Research Journal of Finance and Accounting*, vol. 2, no. 6, pp.1-12.
- Ali, MB 2011b, 'Impact of micro and macroeconomic variables on emerging stock market return: a case on Dhaka stock exchange (DSE)', *Interdisciplinary Journal of Research in Business*, vol. 1, no. 5, pp. 08-16.
- Ali, MB 2011c, 'T-Y Granger causality between stock prices and macroeconomic variables: evidence from Dhaka stock exchange (DSE)', *European Journal of Business and Management*, vol.3, no.8, pp. 37-52.
- Ali, SS & Khalid, M 2001, 'Testing semi-strong form efficiency of stock market', *The Pakistan Development Review*, vol. 40, no. 4, pp. 651–674.
- Alshogheathri, MAM 2011, Macroeconomic determinants of the stock market movements: empirical evidence from the Saudi stock market, doctoral thesis, Kansas State University, Kansas.
- Andreou, E, Matsi, M & Savvides, A2013, 'Stock and foreign exchange market link ages in emerging economies', *Journal of International Financial Markets, Institutions and Money*, vol. 27, pp. 248–268, doi:10.1016/j.intfin.2013.09.003
- Apergis, N, Artikis, G & Eleftheriou, S 2011, 'The role of macroeconomic factors for excess returns: evidence from a group of emerging economies', *Journal of Accounting, Finance and Economics*, vol. 1, no. 2, pp. 1-12.
- Asteriou, D & Price, S 2007, *Applied econometrics: a modern approach*, New York: Palgrave Macmillan Inc.
- Athanassiou, E, Kollias, C & Syriopoulos, T2006, 'Dynamic volatility and external security related shocks: the case of the Athens stock exchange', *Journal of International Financial Markets, Institutions and Money*, vol. 16, no. 5, pp. 411–424, doi:10.1016/j.intfin.2005.04.001
- Aurangzeb, D 2012, 'Factors affecting performance of stock market: evidence from south Asian countries', *International Journal of Academic Research in Business and Social Sciences*, vol. 2, no. 9, pp. 1-15.
- Azzam, I2010, 'Stock exchange demutualization and performance', *Global Finance Journal*, vol. 21, no. 2, pp. 211–222, doi:10.1016/j.gfj.2010.06.007
- Balkiz, O 2003, 'Testing informational market efficiency on Kuala Lumpur stock exchange', *Jurnal Ekonomi Malaysia*, vol.37, pp. 3-20.
- Banerjee, A, Dolado, JJ, Galbraith, JW & Hendry, DF 1993, *Co-integration, error correction, and the econometric analysis of non-stationary data*, Oxford University Press, New York.
- Bangladesh Bank 2001 to 2014, *Monthly Economic Trends*.
- Bangladesh Securities and Exchange Commission 1998-99 to 2012-13, *SEC Annual Report 1998-99 to 2012-13*.
- Bangladesh Securities and Exchange Commission2014, Retrieved from <http://www.sec.gov.bd/>
- Barbić, T & Čondić-Jurkić, I 2011, 'Relationship between macroeconomic fundamentals and stock market indices in selected CEE countries', *Ekonomski Pregled*, vol. 62, no. 3-4, pp. 113-133.
- Basher, SA & Sadorsky, P 2006, 'Oil price risk and emerging stock markets', *Global Finance Journal*, vol. 17, no. 2, pp. 224–251, doi:10.1016/j.gfj.2006.04.001
- Basu, D & Chawla, D2012, 'An empirical test of the arbitrage pricing theory-the case of Indian stock market', *Global Business Review*, vol. 13, no. 3, pp. 421–432, doi:10.1177/097215091201300305
- Bekaert G, Harvey CR & Lundblad CT 2003, 'Equity market liberalisation in emerging markets', *The Journal of Financial Research*, vol. 26, pp. 275-299.
- Binswanger, M2004, 'How do stock prices respond to fundamental shocks?', *Finance Research Letters*, vol. 1, no. 2, pp. 90–99, doi:10.1016/j.frl.2004.03.005
- Bley, J 2011, 'Are GCC stock markets predictable?', *Emerging Markets Review*, vol. 12, no. 3, pp. 217–237, doi:10.1016/j.ememar.2011.03.002
- Bohl, MT & Brzeszczyński, J 2006, 'Do institutional investors destabilize stock prices? evidence from an emerging market', *Journal of International Financial Markets, Institutions and Money*, vol.16, no. 4, pp. 370–383, doi:10.1016/j.intfin.2005.05.005
- Bollerslev, T 1986, 'Generalized Autoregressive Conditional Heteroskedasticity', *Journal of Econometrics*, vol.31, pp. 307-327.
- Bollerslev, T & Hodrick, R 1992, *Financial market efficiency tests*, National Bureau of Economic Research (NBER) Working Paper No. 4108.
- Borges, MR 2008, *Efficient Market Hypothesis in European Stock Markets*, WP 20/2008/DE/CIEF, School of Economics and Management, Technical University of Lisbon.
- Bose, TK, Uddin, R & Islam, W 2014, 'Measuring and comparing the efficiency of Dhaka stock exchange and Chittagong stock exchange', *International Journal of Scientific and Research Publications*, vol.4, no.3, pp. 1-14.
- Boubakari, A & Jin, D 2010, 'The role of stock market development in economic growth: evidence from some Euronext countries', *International Journal of Financial Research*, vol. 1, no. 1, pp. 14-20.
- Broadstock, DC & Filis, G2014, 'Oil price shocks and stock market returns: New evidence from the United States and China', *Journal of International Financial Markets, Institutions and Money*, vol. 33, pp. 417–433, doi:10.1016/j.intfin.2014.09.007
- Brooks, C & Burke, SP 1998, 'Forecasting exchange rate volatility using conditional variance models selected by information criteria', *Economics Letters*, vol. 61, no. 3, pp. 273-278.
- Bumann, S, Hermes, N, & Lensink, R2013, 'Financial liberalization and economic growth: a meta-analysis', *Journal of International Money and Finance*, vol. 33, pp. 255–281, doi:10.1016/j.jimonfin.2012.11.013
- Chaity, NS & Sharmin, S 2012, 'Efficiency measures of capital market: a case of Dhaka stock exchange', *International Journal of Business and Management*, vol. 7, no. 1, pp. 102-108, doi:10.5539/ijbm.v7n1p102
- Campbell, JY, Lo, AW & MacKinlay, AC 1997, *The econometrics of financial markets*, Princeton University Press, New Jersey.
- Campbell, JY & Shiller, RJ1987, 'Cointegration and tests of present value models', *Journal of Political Economy*, vol. 95, no.5, pp.1062-1088.
- Cavallo, L & Mammola, P 2000, 'Empirical tests of efficiency of the Italian index options market', *Journal of Empirical Finance*, vol.7, pp. 173–193.

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- Chang, EJ, Lima, EJA & Tabak, BM 2004, 'Testing for predictability in emerging equity markets', *Emerging Markets Review*, vol. 5, no. 3, pp. 295–316, doi:10.1016/j.ememar.2004.03.005
- Charles, A & Darné, O 2014, 'Large shocks in the volatility of the Dow Jones industrial average index: 1928–2013', *Journal of Banking & Finance*, vol. 43, pp. 188–199, doi:10.1016/j.jbankfin.2014.03.022
- Chau, F, Deesomsak, R, & Wang, J 2014, 'Political uncertainty and stock market volatility in the middle East and north African (MENA) countries', *Journal of International Financial Markets, Institutions and Money*, vol. 28, pp. 1–19, doi:10.1016/j.intfin.2013.10.008
- Chaudhury, MM & Miyan, MA 1990, 'Development of capital markets in Bangladesh', *Journal of Business Administration*, vol. 16, no. 1-2, pp. 71-90.
- Chen, M-P, Chen, P-F, & Lee, C-C 2014, 'Frontier stock market integration and the global financial crisis', *The North American Journal of Economics and Finance*, vol. 29, pp. 84–103, doi:10.1016/j.najef.2014.05.004
- Chen, NF, Roll, R & Ross, SA 1986, 'Economic forces and the stock market', *Journal of Business*, vol. 59, no. 3, pp. 383-403.
- Chiang, TC & Doong, S 1999, 'Empirical analysis of real and financial volatilities on stock excess returns: evidence from Taiwan industrial data', vol. 2, pp. 187–200.
- Ciner, C2013, 'Oil and stock returns: frequency domain evidence', *Journal of International Financial Markets, Institutions and Money*, vol. 23, pp. 1–11, doi:10.1016/j.intfin.2012.09.002
- Chittagong Stock Exchange 2014, Retrieved from <http://www.cse.com.bd/>
- Chowdhury, AR 1994, 'Statistical properties of daily returns from the Dhaka stock exchange', *The Bangladesh Development Studies*, vol. xxii, pp. 61-76.
- Claessen, H & Mittnik, S 2012, *Forecasting stock market volatility and the informational efficiency of the DAX-index options market*, Center for Financial Studies working paper no. 4, an der Johann Wolfgang Goethe-Universität, Taususanlage 6, D-60329, Frankfurt.
- Cooray, AV & Wickramasighe, G 2007, 'The efficiency of emerging stock markets: empirical evidence from the South Asian region', *Journal of Developing Areas*, vol. 41, no. 1, pp. 171-183.
- Crescenzi, A 2009, *Investing from the top down: a macro approach to capital markets*, McGraw-Hill, New Delhi.
- Dekker, A, Sen, K & Young, MR 2001, 'Equity market linkages in the Asia Pacific region—a comparison of the orthogonalised and generalised VAR approaches', *Global Finance Journal*, vol. 12, pp. 1–33.
- DePenya, FJ & Gil-Alana, LA 2007, 'Serial correlation in the Spanish stock market', *Global Finance Journal*, vol. 18, no. 1, pp. 84–103, doi:10.1016/j.gfj.2007.01.001
- Dey, MK 2005, 'Turnover and return in global stock markets', *Emerging Markets Review*, vol. 6, no. 1, pp. 45–67, doi:10.1016/j.ememar.2004.09.003
- Dhaka Stock Exchange 2012-13, *Dhaka Stock Exchange Annual Report 2012-13*.
- Dhaka Stock Exchange 2014, Retrieved from <http://dsebd.org/>
- Dicle, MF & Leventis, J 2011, 'Greek market efficiency and its international integration', *Journal of International Financial Markets, Institutions and Money*, vol. 21, no. 2, pp. 229–246, doi:10.1016/j.intfin.2010.10.005
- Dima, B, Dincă, MS & Spulbar, C2014, 'Financial nexus: efficiency and soundness in banking and capital markets' *Journal of International Money and Finance*, vol. 47, pp. 100–124, doi:10.1016/j.jimonfin.2014.05.002
- Eita, JH 2012, 'Modelling macroeconomic determinants of stock market prices: evidence from Namibia', *The Journal of Applied Business Research*, vol. 28, no. 5, pp. 871-874.
- El-Nader, HM & Alraimony, AD 2013, 'The macroeconomic determinants of stock market development in Jordan', *International Journal of Economics and Finance*, vol. 5, no. 6, pp. 91-103, doi:10.5539/ijef.v5n6p91
- Elbarghouthi, S, Yassin, M & Qasim, A 2012, 'Is Amman stock exchange an efficient market?', *International Business Research*, vol. 5, no. 1, pp. 140-156, doi:10.5539/ibr.v5n1p140
- Elshareif, EE, Tan, H & Wong, M 2012, 'Unexpected volatility shifts and efficiency of emerging stock market: the case of Malaysia', *Business Management Dynamics*, vol. 1, no.10, pp.58-66.
- Enders, W 2004, *Applied econometric time series*. Second edition, John Wiley & Sons Inc, New York.
- Engle, R F 1982, 'Autoregressive conditional heteroskedasticity with estimates of the variance of UK inflation', *Econometrica*, vol. 50, pp. 987-1007.
- Engle, RF 1993, 'Statistical models for financial volatility', *Financial Analysts Journal*, vol. 49, pp. 72-78.
- Engle, RF & Granger, CWJ 1987, 'Co-integration and error correction: representation, estimation, and testing', *Econometrica*, vol. 55, no. 2, pp. 251-76.
- Erdugan, R 2012, The effect of economic factors on the performance of the Australian stock market, doctoral thesis, Victoria University, Melbourne.
- Fama, EF 1965, 'The behavior of stockmarket prices', *Journal of Business*, vol. 38, no. 34-105.
- Fama, EF 1970, 'Efficient capital markets: a review of theory and empirical work', *Journal of Finance*, vol. 25, no. 2, pp. 383-415.
- Fama, EF 1981, 'Stock returns, real activity, inflation, and money', *American Economic Review*, vol. 71, no. 4, pp. 545-565.
- Fama, EF 1990, 'Stock returns, expected returns, and real activity', *Journal of Finance*, vol. 45, no. 4, pp. 1089-1108.
- Febrian, E& Herwany, A 2007, 'Co-integration and causality among Jakarta stock exchange, Singapore stockexchange, and Kuala Lumpur stockexchange', *MPRA Paper*, no. 9637, pp.1-17.
- Farsio F & Fazel S 2013, 'The stock market/unemployment relationship in USA, China and Japan', *International Journal of Economics and Finance*, vol. 5, no. 3, pp. 24-29, doi:10.5539/ijef.v5n3p24.
- Fernández-Izquierdo, A & Lafuente, JA 2004, 'International transmission of stock exchange volatility: empirical evidence from the Asian crisis', *Global Finance Journal*, vol. 15, no. 2, pp. 125–137, doi:10.1016/j.gfj.2004.02.002
- Florackis, C, Kontonikas, A & Kostakis, A 2014, 'Stock market liquidity and macro-liquidity shocks: evidence from the 2007–2009 financial crisis' *Journal of International Money and Finance*, vol. 44, pp. 97–117, doi:10.1016/j.jimonfin.2014.02.002
- Forgha, NG 2012, 'An investigation into the volatility and stock returns efficiency in African stock exchange markets', *International Review of Business Research Papers*, vol. 8, no.5, pp. 176–190.
- Garcia, VF & Liu, L 1999, 'Macroeconomic determinants of stockmarketdevelopment', *Journal of Applied Economics*, vol. 2, No. 1, pp.29-59.
- Gimba, VK 2012, 'Testing the weak-form efficiency market hypothesis:evidence from Nigerian stock market', *CBN Journal of Applied Statistics*, vol. 3, no.1, pp. 117- 136.
- Govati, C 2009, Examining the effects of macroeconomic variables on the Malawi stock exchange, masters thesis, University of Malawi.
- Graham, M, Kiviahio, J & Nikkinen, J 2012, 'Integration of 22 emerging stock markets: a three-dimensional analysis', *Global Finance Journal*, vol. 23, no. 1, pp. 34–47, doi:10.1016/j.gfj.2012.01.003
- Granger, CWJ 1969, 'Investigating causal relations by econometric models and cross spectral methods', *Econometrica*, vol. 37, pp. 428-438.
- Granger, CWJ 1988, 'Some recent developments in a concept of causality', *Journal of Econometrics*, vol. 39, pp. 199-211.
- Granger, CWJ, &Newbold, P 1974, 'Spurious regressions in econometrics', *Journal of Econometrics*, vol. 2, pp. 111-120.
- Greener, DS 2008, *Business research methods*, e-book, Available from: <http://bookboon.com/en/introduction-to-research-methods-ebook> (Accessed 12 Januray 2013).
- Groenewold, N& Kang, K 1993, 'The semi-strong efficiency of the Australian share market', *Economic Record*, vol. 69, no.207, pp. 405-410.
- Gujarati, DN 2004, *Basiceconometrics*, 4th edn, The McGraw-Hill Companies, New Delhi.
- Gunasekarage, A & Power, DM 2001, 'The profitability of moving average trading rules in South Asian stock markets', *Emerging Markets Review*, vol. 2, no. 1, pp. 17–33, doi:10.1016/S1566-0141(00)00017-0
- Gunasekarage, A, Pisedtasalasai, A & Power, DM 2004, 'Macroeconomic influence on the stock market: evidence from an emerging market in south Asia', *Journal of Emerging Market Finance*, vol. 3, no. 3, pp. 285–304, doi:10.1177/097265270400300304



## Turkish Economic Review

- Gupta, R & Basu, PK 2007, 'Weak form efficiency in Indian stock markets', *International Business & Economics Research Journal*, vol. 6, no. 3, pp. 57-64.
- Hameed, A & Ashraf, H 2006, 'Stock market volatility and weak-form efficiency: evidence from an emerging market', *The Pakistan Development Review*, vol. 45: 4, no. 2, pp. 1029-1040.
- Haque, MH & Fatima, N 2011, 'Influences of stock market on real economy: a case study of Bangladesh', *The Global Journal of Finance and Economics*, vol.8, no.1, pp.49-60.
- Hasan, MZ, Kamil, AA & Baten, MA 2011, 'Evaluation of stock market technical efficiency with a comparison of groups of companies in Dhaka stock exchange', *International Journal of the Physical Sciences*, vol. 6, no. 24, pp. 5857-5865, DOI: 10.5897/IJPS11.513
- Hasan, MZ, Kamil, AA, Mustafa, A & Baten, MA 2012, 'Estimating stock market technical efficiency for truncated normal distribution: evidence from Dhaka stock exchange', *Trends in Applied Sciences Research*, vol. 7, no. 7, pp. 532-540.
- Hassan, MK, Islam, MA & Basher, SA 2002, *Market efficiency, time-varying volatility and equity returns in Bangladesh stock market*, Working Papers 2002–2006, Department of Economics, York University, viewed 02 August 2013, [http://dept.econ.yorku.ca/research/workingPapers/working\\_papers/DSE.pdf](http://dept.econ.yorku.ca/research/workingPapers/working_papers/DSE.pdf)
- Herve, DBG, Chamalali, B & Shen, Y 2011, 'The study of causal relationship between stock market indices and macroeconomic variables in Cote D'ivoire: evidence from error-correction models and granger causality test', *International Journal of Business and Management*, vol. 6, no. 12, pp. 146-169, doi:10.5539/ijbm.v6n12p146
- Hou, AJ 2013, 'Asymmetry effects of shocks in Chinese stock markets volatility: A generalized additive nonparametric approach', *Journal of International Financial Markets, Institutions and Money*, vol. 23, pp. 12–32, doi:10.1016/j.intfin.2012.08.003
- Hsing, Y 2013, 'The stock market and macroeconomic factors in japan and policy implications', *International SAMANM Journal of Accounting and Finance*, vol. 1, no. 1, pp. 32-43.
- Hsing, Y, Budden, MC & Phillips, AS 2012, 'Macroeconomic determinants of the stock market index for a major Latin American country and policy implications', *Business and Economic Research*, vol. 2, no. 1, pp. 1-10, doi:10.5296/ber.v2i1.1152
- Hussey, J & Hussey, R 2003, *Business research: a practical guide for undergraduate and postgraduate students*, 2<sup>nd</sup> ed., New York: Palgrave.
- Islam, MN 2011, 'Problems and prospects of stock market in Bangladesh', *Economic Research*, vol. 12, p. 67.
- Islam, MS & Jahan, S 2012, 'Analysis of financial products of capital market in Bangladesh: present status and future development', *International Journal of Marketing Studies*, vol. 4, no. 5, pp. 119-128, doi:10.5539/ijms.v4n5p119
- Isemla, PA & Erah, DO 2012, 'Share prices and macroeconomic factors: a test of the arbitrage pricing theory (apt) in the Nigerian stock market', *European Journal of Business and Management*, vol 4, no.15, pp. 66-76.
- Jain, DK, 'Impact of selected macro-economic indicators on SENSEX', *International Journal of Advanced Research in Management and Social Sciences*, vol. 2, no. 10, pp. 169-180, ISSN: 2278-6236.
- Johansen, S 1988, 'Statistical analysis of cointegrating vectors', *Journal of Economic Dynamics and Control*, vol. 12 pp. 231-54.
- Johansen, S & Juselius, K 1990, 'Maximum likelihood estimation and inference on cointegration with applications to the demand for money', *Oxford Bulletin of Economics and Statistics*, vol. 52, no. 2, pp. 169-210.
- Katechos, G 2011, 'On the relationship between exchange rates and equity returns: a new approach' *Journal of International Financial Markets, Institutions and Money*, vol. 21, no. 4, pp. 550–559, doi:10.1016/j.intfin.2011.03.001
- Kazi, MH 2008, 'Systematic risk factors for Australian stock market returns: a cointegration analysis', *Australasian Accounting Business and Finance Journal*, vol. 2, no. 4, pp. 89-100.
- Kenani, JM, Maoni, F, Kaunda, S & Nyirenda, D 2012, 'Short-run and long-run dynamics of stock prices and exchange rates in developing economies: evidence from Malawi', *European Journal of Business and Management*, vol.4, no.18, pp. 174-184.
- Kettell, B 2002, *Economics for financial markets*, Butterworth-Heinemann, New delhi.
- Khan, AQ & Ikram, S 2010, 'Testing semi-strong form of efficient market hypothesis in relation to the impact of foreign institutional investors' (FI's) investments on Indian capital market', *International Journal of Trade, Economics and Finance*, vol. 1, no. 4, pp. 373-379.
- Khan, AQ & Ikram, S 2011, 'Testing strong form market efficiency of Indian capital market: performance appraisal of mutual funds', *International Journal of Business & Information Technology*, vol. 1, no. 1, pp. 151-161.
- Khan, M 2013, An analysis of market efficiency in the South Asian emerging stock markets: Bangladesh, India, Pakistan and Sri Lanka, doctoral thesis, University of Dundee, Scotland.
- Khan, MM & Yousuf, AS 2013, 'Macroeconomic forces and stock prices: evidence from the Bangladesh stock market', *MPRA Paper No. 46528*, viewed 11 June 2013, <http://mpra.ub.uni-muenchen.de/id/eprint/46528>
- Khandoker, MSH, Siddik, MNA & Azam, M 2011, 'Tests of weak-form market efficiency of Dhaka stock exchange: evidence from bank sector of Bangladesh', *Interdisciplinary Journal of Research in Business*, vol. 1, no. 9, pp.47- 60.
- Kibria, A 2015, 'PwC projects BD to be 23rd largest economy in 2050', *The Financial Express*, 16 February.
- Kim, B & Kenny, LW 2007, 'Explaining when developing countries liberalize their financial equity markets', *Journal of International Financial Markets, Institutions and Money*, vol. 17, no. 4, pp. 387–402, doi:10.1016/j.intfin.2006.02.003
- Kisaka, SE & Mwasaru, A 2012, 'The causal relationship between exchange rates and stock prices in Kenya', *Research Journal of Finance and Accounting*, vol. 3, no. 7, pp. 121-130.
- Kozhan, R 2010, *Financial econometrics*, e-book, Available from: <http://bookboon.com/en/financial-econometrics-eviews-ebook> (Accessed 30 March 2013).
- Kumar, R & Dhankar, RS 2010, 'Empirical analysis of conditional heteroskedasticity in time series of stock returns and asymmetric effect on volatility', *Global Business Review*, vol. 11, no. 1, pp. 21–33, doi:10.1177/09721509090100102
- Kirchgassner, G & Wolters, J 2007, *Introduction to modern time series analysis*, Springer, Berlin.
- Kuwornu, JKM & Owusu-Nantwi, V 2011, 'Macroeconomic variables and stock market returns: full information maximum likelihood estimation', *Research Journal of Finance and Accounting*, vol. 2, no. 4, pp. 49-63.
- Kwon, CS, & Shin, TS 1999, 'Cointegration and causality between macroeconomic variables and stock market returns', *Global Finance Journal*, vol. 10, no.1, pp. 71–81, doi:10.1016/S1044-0283(99)00006-X
- Lagoarde-Segot, T & Lucey, BM 2008, 'Efficiency in emerging markets - evidence from the MENA region', *Journal of International Financial Markets, Institutions and Money*, vol. 18, no. 1, pp. 94–105, doi:10.1016/j.intfin.2006.06.003
- Laopodis, NT 2004, 'Financial market liberalization and stock market efficiency: evidence from the Athens stock exchange', *Global Finance Journal*, vol. 15, no. 2, pp. 103–123, doi:10.1016/j.gfj.2004.06.001
- Laopodis, NT 2011, 'Equity prices and macroeconomic fundamentals: international evidence', *Journal of International Financial Markets, Institutions and Money*, vol. 21, no. 2, pp. 247–276, doi:10.1016/j.intfin.2010.10.006
- Lata, RS 2014, Non-performing loan and its impact on profitability of state owned commercial banks in Bangladesh: an empirical study, *Proceedings of 11<sup>th</sup> Asian Business Research Conference*, 26-27 December, 2014, BIAM Foundation, Dhaka, Bangladesh.
- Lee, TH 1994, 'Spread and volatility in spot and forward exchange rates', *Journal of International Money and Finance*, vol. 13, pp. 375-383.
- Lee, Y-H 2013, 'Global and regional range-based volatility spillover effects', *Emerging Markets Review*, vol. 14, pp. 1–10, doi:10.1016/j.ememar.2012.09.007
- Leigh, L 1997, *Stock market equilibrium and macroeconomic fundamentals*, International Monetary Fund Working Paper no. WP/97/15, January 1997.
- Levine, R 1991, 'Stock markets, growth, and tax policy', *Journal of Finance*, vol. 46, pp. 1445-1465.
- Levine, R & Zervos, S 1996, 'Stock market development and long-run growth', *The World Bank Economic Review*, vol.10, no.2, pp. 323-339.
- Levy, T & Yagil, J 2013, 'Changing the methodology of equity indices—The case of the Tel-Aviv stock exchange', *Journal of International Financial Markets, Institutions and Money*, vol. 26, pp. 91– 99, <http://dx.doi.org/10.1016/j.intfin.2013.04.001>
- Li, Y, Hamill, PA & Opong, K 2010, 'Do benchmark African equity indices exhibit the stylized facts?', *Global Finance Journal*, vol. 21, no. 1, pp. 71–97, doi:10.1016/j.gfj.2010.03.006

## Turkish Economic Review

- Lind, DA, Marchal, WG & Wathen, SA 2008, *Statistical techniques in business and economics*, Tata McGraw-Hill Publishing Company Limited, New Delhi.
- Lizardo, RA & Mollick, AV 2009, 'Do foreign purchases of U.S. stocks help the U.S. stock market?' *Journal of International Financial Markets, Institutions and Money*, vol. 19, no. 5, pp. 969–986, doi:10.1016/j.intfin.2009.08.002
- Malliaris, AG and Urrutia, JL 1991, 'An empirical investigation among real, monetary and financial variables', *Economics Letters*, vol. 37, no. 2, pp. 151–158.
- Masuduzzaman, M 2012, 'Impact of the macroeconomic variables on the stock market returns: the case of Germany and the United Kingdom', *Global Journal of Management and Business Research*, vol. 12, no. 16, pp. 23–34.
- Mecagni, M & Sourial, MS 1999, *The Egyptian stock market: efficiency tests and volatility effects*, International Monetary Fund Working Paper no. 99/48, April 1999.
- Mehrara, M 2006, 'The relationship between stock market and macroeconomic variables: a case study for Iran', *Iranian Economic Review*, vol. 10, no. 17, 2006, pp. 137–148.
- Mensi, W, Hammoudeh, S, Reboredo, JC, & Nguyen, DK 2014, 'Do global factors impact BRICS stock markets? a quantile regression approach', *Emerging Markets Review*, vol. 19, pp. 1–17, doi:10.1016/j.ememar.2014.04.002
- Ministry of Finance, People's Republic of Bangladesh 2013, *Bangladesh Economic Review 2013*.
- Ministry of Planning, People's Republic of Bangladesh 2011, *Sixth Five Year Plan FY2011-FY2015: Accelerating growth and reducing poverty*, viewed 10 November 2014, <http://www.plancomm.gov.bd/sixth-five-year-plan/>
- Mishra, PK 2012, 'Efficiency of south Asian capital markets: an empirical analysis', *Pak. J. Commer. Soc. Sci.*, vol. 6, no. 1, pp. 27–34.
- Moazzem, KG & Rahman, TM 2011, *Stabilising the capital market of Bangladesh: addressing the structural, institutional and operational issues*, CPD dialogue on State of the Capital Market and Recent Policy Initiatives, 12 December, BRAC Centre Inn Auditorium, Dhaka.
- Mobarek, A & Keasey, K 2000, 'Weak-form market efficiency of an emerging Market: evidence from Dhaka stock market of Bangladesh', paper presented at the *ENBS Conference*, May, Oslo, viewed 3 February 2014, <http://e-m-h.org/MoKe00.pdf>
- Mohanty, SK, Nandha, M, Turkistani, AQ & Alaitani, MY 2011, 'Oil price movements and stock market returns: evidence from Gulf Cooperation Council (GCC) countries', *Global Finance Journal*, vol. 22, no. 1, pp. 42–55, doi:10.1016/j.gfj.2011.05.004
- Mohiuddin, M, Alam, MD & Shahid, AI 2008, *An empirical study of the relationship between macroeconomic variables and stock price: a study on Dhaka stock exchange (DSE)*, AIUB Bus Econ Working Paper Series, No 2008-21, viewed 02 August 2013, <http://orp.aiub.edu/WorkingPaper/WorkingPaper.aspx?year=2008>
- Morelli, D 2010, 'European capital market integration: An empirical study based on a European asset pricing model', *Journal of International Financial Markets, Institutions and Money*, vol. 20, no. 4, pp. 363–375, doi:10.1016/j.intfin.2010.03.007
- Mougoué, M & Whyte, AM 1996, 'Stock returns and volatility: an empirical investigation of the German and French equity markets', *Global Finance Journal*, vol. 7, no. 2, pp. 253–263, doi:10.1016/S1044-0283(96)90008-3
- Moustafa, MA, 2004, 'Testing the weak-form efficiency of the United Arab Emirates stock market', *International Journal of Business*, vol. 9, no. 3, pp. 309–325.
- Mukherjee, TK & Naka A 1995, 'Dynamic relation between macroeconomic variables and the Japanese stock market: an application of a vector error correction model', *Journal of Financial Research*, vol. 18, pp. 223–237.
- Muktadir-al-mukit, D 2013, 'An econometric analysis of the impact of monetary policy on stock market performance in Bangladesh', *World Review of Business Research*, vol. 3, no. 3, pp. 16–29.
- Naik, PK 2013, 'Does stock market respond to economic fundamentals? timeseries analysis from Indian data', *Journal of Applied Economics and Business Research*, vol. 3, no. 1, pp. 34–50.
- Naik, PK & Padhi, P 2012, 'The impact of macroeconomic fundamentals on stock prices revisited: evidence from Indian data', *Eurasian Journal of Business and Economics*, vol. 5, no. 10, pp. 25–44.
- Najand, M, & Noronha, G 1998, 'Causal relations among stock returns, inflation, real activity, and interest rates: evidence from Japan', *Global Finance Journal*, vol. 9, no. 1, pp. 71–80, doi: 10.1016/S1044-0283(98)90015-1
- Naka, A, Mukherjee, T & Tufte, D 1988, *Macroeconomic variables and the performance of the Indian stock market*, Department of Economics and Finance Working Papers, 1991–2006, Paper no. 15.
- Narayan, PK, Narayan, S, & Thuraisamy, KS 2014, 'Can institutions and macroeconomic factors predict stock returns in emerging markets?', *Emerging Markets Review*, vol. 19, pp. 77–95, doi:10.1016/j.ememar.2014.04.005
- Nasseh, A & Strauss, J 2004, 'Stock prices and dividend discount model: did their relation break down in the 1990s?', *The Quarterly Review of Economics and Finance*, vol. 44, no. 2, pp. 191–207.
- Nelson, DB 1991, 'Conditional heteroskedasticity in asset returns: a new approach', *Econometrica*, vol. 59, no. 2, pp. 347–370.
- Nguyen, CV & Ali, MM 2011, 'Testing the weak efficient market hypothesis using Bangladeshi panel data', *Banks and Bank Systems*, vol. 6, no. 1, pp. 11–15.
- Nguyen, CV, Islam, AM & Ali, MM 2013, 'Equity price indices and random walk: the case of Malaysia, the Philippines and Taiwan', *International Review of Business Research Papers*, vol. 9, no. 5, pp. 28–38.
- Nikita, MP & Soekarno, S 2012, 'Testing on weak form market efficiency: the evidence from Indonesia stock market year 2008–2011', paper presented at the *2nd International Conference on Business, Economics, Management and Behavioral Sciences*, 13–14 October, Bali, Indonesia, viewed 3 September 2014, <http://psrcentre.org/images/extrainimages/1012504.pdf>
- Nikkinen, J, Omran, M, Sahlström, P, & Åijö, J 2006, 'Global stock market reactions to scheduled U.S. macroeconomic news announcements', *Global Finance Journal*, vol. 17, no. 1, pp. 92–104, doi:10.1016/j.gfj.2006.06.003
- Nisar, S & Hanif, M 2012, 'Testing weak form of efficient market hypothesis: empirical evidence from south-Asia', *World Applied Sciences Journal*, vol. 17, no. 4, pp. 414–427.
- Oke, MO & Azeez, BA 2012, 'A test of strong-form efficiency of the Nigerian capital market', *Business Systems Review*, vol. 1, no. 1, pp. 10–26, DOI: 10.7350/bsr.a03.2012
- Olweny, TO & Kimani, D 2011, 'Stock market performance and economic growth: empirical evidence from Kenya using causality test approach', *Advances in Management & Applied Economics*, vol. 1, no. 3, pp. 153–196.
- Omar, M, Hussain, H, Bhatti, GA & Altaf, M 2013, 'Testing of random walks in Karachi stock exchange', *Finance Management*, vol. 54, pp. 12293–12299.
- Osamwonyi, IO & Evbayiro-Osagi, EI 2012, 'The relationship between macroeconomic variables and stock market index in Nigeria', *J Economics*, vol. 3, no. 1, pp. 55–63.
- Oseni, IO & Nwosa, PI 2011, 'Stock market volatility and macroeconomic variables volatility in Nigeria: an exponential GARCH approach', *Journal of Economics and Sustainable Development*, vol. 2, no. 10, pp. 28–42.
- Oskoee, SAP 2011, 'The random walk hypothesis in emerging stock market-evidence from nonlinear fourier unit root test', *Proceedings of the World Congress on Engineering*, July 6–8, London, U.K., viewed 04 November 2014, [www.iaeng.org/publication/WCE2011/WCE2011\\_pp418-422.pdf](http://www.iaeng.org/publication/WCE2011/WCE2011_pp418-422.pdf)
- Pan, M-S, Liu, YA, & Roth, HJ 1999, 'Common stochastic trends and volatility in Asian-Pacific equity markets', *Global Finance Journal*, vol. 10, no. 2, pp. 161–172, doi:10.1016/S1044-0283(99)00012-5
- Papadamou, S, Sidiropoulos, M & Spyromitros, E 2014, 'Does central bank transparency affect stock market volatility?' *Journal of International Financial Markets, Institutions and Money*, vol. 31, pp. 362–377, doi:10.1016/j.intfin.2014.05.002
- Parvez I & Basak, SR 2012, 'Observing the volatility switching of Dhaka stock exchange by transition probability and limiting probability', *IJAR-BAE*, vol. 1, no. 1, pp. 07–12.
- Patel, S 2012, 'The effect of macroeconomic determinants on the performance of the Indian stock market', *NMIMS Management Review*, vol. XXII, pp. 117–127.
- Patel, NR, Radadia, N & Dhawan, J 2012, 'An empirical study on weak-form of market efficiency of selected Asian stock markets', *Journal of Applied Finance & Banking*, vol. 2, no. 2, pp. 99–148.
- Peng, J, Cui, J, Groenewold, N & Qin, F 2009, 'Stock prices and the macro economy in China', *Economics Discussion Paper no. 09.20*, Business School, University of Western Australia.
- Pesaran, MH & Pesaran, B 1997, *Working with microfit 4: interactive econometric analysis*, Oxford University Press, London.
- Phillips, PCB, & Perron, P 1988, 'Testing for a unit root in time series regression', *Biometrika*, vol. 75, no. 2, pp. 335–46.

## Turkish Economic Review

- Pilinkus, D & Boguslauskas, V 2009, 'The short-run relationship between stock market prices and macroeconomic variables in Lithuania: an application of the impulse response function', *Engineering Economics*, vol. 5, pp. n.p.
- Poudeh, N 2013, 'The impact of macroeconomic variables on S&P 500 stock return, masters thesis, University of Southern Denmark, Odense.
- Prakash, S & Arora, CB 2013, 'Determination of opening prices of equities of the day', *Journal of Applied Finance & Banking*, vol. 3, no. 4, pp. 199-227.
- Qadir, MM 2012, 'The effect of macroeconomic variables on stock returns on Dhaka stock exchange', *International Journal of Economics and Financial Issues*, vol. 2, no. 4, pp. 480-487.
- Rahaman, MA, Hasan, MB & Ahsan AFM 2013, 'Stock market performance under different government periods: evidence from Bangladesh', *Universal Journal of Accounting and Finance*, vol. 1, no. 2, pp. 42-50.
- Rahman, AA, Mohd Sidek, NZ & Taffri, FH 2009, 'Macroeconomic determinants of Malaysian stock market', *African Journal of Business Management*, vol. 3, no. 3, pp. 95-106.
- Rahman, AFMA 2012, 'Reward for taking risk at DSE – an application of zero beta CAPM', *Journal of Business and Policy Research*, vol. 7, no. 3, pp. 48 – 59.
- Rahman, ML & Uddin, J 2009, 'Dynamic relationship between stock prices and exchange rates: evidence from three south Asian countries', *International Business Research*, vol. 2, no. 2, pp. 167-174.
- Rahman, ML & Uddin, J 2012, 'Test of weak form of efficiency in emerging markets: a south Asian evidence', *ABAC Journal*, vol. 32, no. 1, pp. 1-15.
- Rahman, MT & Moazzem, KJ 2011, 'Capital market of Bangladesh: volatility in the Dhaka stock exchange (DSE) and role of regulators', *International Journal of Business and Management*, vol. 6, no. 7, pp. 86-93.
- Ray, S 2012, 'Testing Granger causal relationship between macroeconomic variables and stock price behaviour: evidence from India', *Advances in Applied Economics and Finance*, vol. 3, no. 1, pp. 470-481, ISSN 2167-6348.
- Rayhan, MA, Sarkar, SMAI & Sayem, SM 2011, 'The volatility of Dhaka stock exchange (DSE) returns: evidence and implications', *ASA University Review*, vol. 5, no. 2, pp. 87-99.
- Rizeanu, S & Zhang, H 2013, 'Exchange rates and portfolio rebalancing: evidence from emerging economies', *International Journal of Economics and Finance*, vol. 5, no. 2, pp. 158-27, Doi:10.5539/ijef.v5n2p15
- Ross, SA 1976, 'The arbitrage theory of capital asset pricing', *Journal of Economic Theory*, vol. 13, pp. 341-61.
- Sabunwala, ZZ 2012, 'A study of the impact of macroeconomic variables on stock price movements for the period 1993- 2010', *International Journal of Research in Commerce, Economics & Management*, vol. 2, no. 6, pp. 107-110.
- Sachdeva, YP 1994, *Rise and fall of share prices: factors & determinants*, Deep & Deep Publications, New Delhi.
- Sarker, MM & Nargis, N 2012, 'Identifying the critical issues of stock market: a study on Dhaka stock exchange (DSE)', *International Journal of Applied Research in Business Administration & Economics*, vol. 01, no.03, pp. 48-55.
- Schwert, GW 1989, 'Why does stock market volatility change over time?', *Journal of Finance*, vol. 44, no.5, pp. 1115-1153.
- Sharma, GD & Mahendru, M 2009, 'Efficiency hypothesis of the stock markets: a case of Indian securities', *International Journal of Business and Management*, vol. 4, no. 3, pp. 136-144.
- Sharma, GD & Mahendru, M 2010, 'Impact of macro- economic variables on stock prices in India', *Global Journal of Management and Business Research*, vol. 10, no. 7, pp. 19-26.
- Singh, S, Tripathi, DLK & Lalwani, K 2012, 'An empirical study of impact of exchange rate & inflation rate on performance of BSE SENSEX', *SAJMR Spectrum: A Journal of Multidisciplinary Research*, vol. 1, no. 3, pp. 20-31.
- Siourounis, GD 2002, 'Modeling volatility and testing for efficiency in emerging capital markets: the case of the Athens stock exchange', *Applied Financial Economics*, vol. 12, pp. 47-55, DOI: 10.1080/0960310011008800 3
- Sohel, K 2015, 'Study: Bangladesh to be 23rd largest economy by 2050', DhakaTribune, 16 March, viewed 5 May 2015, <http://www.dhakatribune.com/economy/2015/mar/16/study-bangladesh-be-23rd-largest-economy-2050>
- Srivastava, A 2010, 'Relevance of macro economic factors for the Indian stock market', *Decision*, vol. 37, no.3, pp. 69-89.
- Standards and Poor's 2009, *Global Stock Markets Factbook 2009*.
- Stock Index Data 2013, CD-ROM, Dhaka Stock Exchange, Dhaka, Bangladesh.
- The World Bank 2013, *Bangladesh: bolstering economic growth to reduce poverty*, viewed 15 March 2015, <http://www.worldbank.org/en/results/2013/04/15/bangladesh-bolstering-economic-growth-to-reduce-poverty>
- Tiwari, AK & Kyophilavon, P 2014, 'New evidence from the random walk hypothesis for BRICS stock indices: a wavelet unit root test approach', *Economic Modelling*, vol. 43, pp. 38–41, <http://dx.doi.org/10.1016/j.econmod.2014.07.005>
- Tsai, I-C 2012, 'The relationship between stock price index and exchange rate in Asian markets: A quantile regression approach', *Journal of International Financial Markets, Institutions and Money*, vol. 22, no. 3, pp. 609–621, doi:10.1016/j.intfin.2012.04.005
- Tsay, RS 2010, *Analysis of financial time series*, Second edition, Wiley-Interscience, New York.
- Uddin, MB 2009, 'Determinants of market price of stock: a study on bank leasing and insurance companies of Bangladesh', *Journal of Modern Accounting and Auditing*, vol. 5, no. 7, pp. 1-20.
- Ullah, MH, Kabir, MR & Ahmed, M 2012, 'Catastrophe in stock market in Bangladesh- a view of investors and financial analysis of Chittagong stock exchange', *International Journal of Economics and Finance*, vol. 4, no. 7, pp. 117-131.
- U.S. Energy Information Administration 2015, viewed 04 March 2015, <http://www.eia.gov/countries/country-data.cfm?fips=bg#pet>
- Vejjagic, M & Zarafat, H 2013, 'Relationship between macroeconomic variables and stock market index: co-integration evidence from ftse bursa Malaysia hijrah shariah index' *Asian Journal of Management Sciences & Education*, vol. 2, no. 4, pp. 94-108, ISSN: 2186-8441.
- Walid, C, Chaker, A, Masood, O & Fry, J 2011, 'Stock market volatility and exchange rates in emerging countries: a markov-state switching approach' *Emerging Markets Review*, vol. 12, no. 3, pp. 272–292, doi:10.1016/j.ememar.2011.04.003
- Wang, S & Mayes, DG 2012, 'Monetary policy announcements and stock reactions: an international comparison', *The North American Journal of Economics and Finance*, vol. 23, no. 2, pp. 145–164, doi:10.1016/j.najef.2012.02.002
- World Bank 2013, World Development Indicators 2013, <http://data.worldbank.org/products/wdi> accessed on 10 March 2014.
- Wyss, BO 2001, *Fundamentals of the stock market*, McGraw-Hill, USA.
- Zakaria, Z & Shamsuddin, S 2012, 'Empirical evidence on the relationship between stock market volatility and macroeconomics volatility in Malaysia', *Journal of Business Studies Quarterly*, vol. 4, no. 2, pp. 61-71.



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