International Journal of Management, Accounting and Economics
Vol. 6, No. 1, January, 2019
ISSN 2383-2126 (Online)

www.ijmae.com

Is Stock Price Volatility A Risk? : An Evaluation Review

Rabia Qammar[1]
School of Economics, Finance and Banking, UUM, Malaysia

Rana Zain-Ul-Abidin
School of Business management, UUM, Malaysia

Abstract

Price volatility presents the investor possibilities and opportunities to buy securities at cheap prices and then sell it when they are overpriced, resulting in a profit at the end of the day. Recently, the volatility has become more valuable aspect for investors. Investment risk and return is important for investors. Investors have risk averse nature, they concerned about the information flow of stock price volatility. This study aims to review the literature on stock price volatility significance and its measurements by different methods. This study provides the detail review of stock price volatility different types including historical, implied, intraday, and indices volatility. This study discusses various measurements of stock price volatility forecasting with the empirical findings. Efficient market hypothesis supports the changes in stock prices in prior literature. Some studies shows that volatility can be measured by standard deviation of investor's stock return. The price volatility mostly determined by high, low and closing prices. It is found that forecasting volatility can be measured by different methods. The literature review suggests that GARCH and Parkinson formula is considered most reliable method to measure volatility. Parkinson is more reliable measurement because it has daily high and low stock prices.

Keywords: Volatility; GARCH; Parkinson; Efficient Market Hypothesis.

Cite this article: Qammar, R., & Zain-Ul-Abidin, R. (2019). Is Stock Price Volatility A Risk? : An Evaluation Review. *International Journal of Management, Accounting and Economics, 6*(1), 80-87.

[1] *Corresponding author's email: rabiaqmr9@yahoo..com*

Introduction

From last decades, volatility has become more noteworthy and influential instrument in the financial world (Zainudin, Mahdzan, & Yet, 2018). Investors are attracted towards the changes in stock prices. They have risk averse nature. Investors try to find more return on their investment with less risk. Trade-off between risk and return is the basic rule of finance (Fama, 2017). The fluctuations in daily stock prices is the basic form of volatility. It is considered as measurement of systematic risk for investors (Hussainey, Mgbame & Chijoke-Mgbame, 2011). The broad changes in prices indicate high volatility whereas subtler changes in prices indicate low volatility.

There is positive relationship found between risk and return, when returns are expected and risk is uncertain. There is negative relationship between realized return and uncertain volatility. The increment of unexpected volatility enhance the required rate of return which ultimately decrease stock prices (Sumathi, & Maheswari, 2017). The forecasting of volatility is calculated by different methods. Koudijs (2016) stated that the volatility is measured by the difference of current price of assets and its past prices average. It is also measured by standard deviation of returns. The purpose of this paper is to review about the significance of stock price volatility and measurements of stock price volatility. Price volatility presents the investor possibilities and opportunities to buy securities at cheap prices and then sell it when they are overpriced, resulting in a profit at the end of the day. All of the explained aspects are reasons why share price volatility is of great importance in the financial world where securities trading takes place.

There was very few studies found on the review of stock price volatility measurements. This study is differ from other price volatility review based studies it discusses the types of volatility and different measurements of volatility. Also, this study mainly focus on the empirical literature about stock price volatility. The rest of the paper proceeds are as follows: types of stock price volatility, theory of efficient market, measurements of stock price volatility, and discusses the empirical studies on stock price volatility. Finally, this study concludes the paper.

Methodology

Stock price volatility represents the fluctuation of prices over the certain time period. There are four types of stock price volatility (Tang & Xu, 2013).

Historical volatility: Historic volatility is the standard deviation of the change in stock prices or other financial instrument relative to its historic price over a period of time (Beaver, Kettler & Scholes, 1970; Arthur, 2018).

Implied volatility: The implied volatility is the opposite of historical. It mentions the certain stock prices estimation. It stated by stock price certain percentage which have standard deviation shift over a year. Mostly, implied volatility utilized to forecasting of option prices (Chiou & Lee, 2009; Deng, Liu & Wei, 2018).

Volatility Indices: the indices volatility measures the changes in indexes such as S&P 500 (SPX) or its exchange-traded fund equivalent (Fama, 2017). The volatility index

created for the indices which quoted in the financial media. Many market participants utilize these indices as a market sentiment gauge.

Intraday Volatility: Intraday volatility signifies the market swings in the course of a trading day (Garleanu & Pedersen, 2018). It is difficult to define intraday volatility. It is hard to differentiate between implied and intraday volatility. These both have their own importance and these are not interchangeable. Both determines the sentiments and expectations of investors.

Insight on stock price volatility measurement

Volatility of return is the widespread concept of risk representation (Jurado, Ludvigson & Ng, 2015). The different types of volatility is used to forecast the risk from historical prices, option prices, indices and intraday trading. The problem creates when stock market have unexpected volatility which effect financial economy. From recent past, it is observed that there is a high volatility in the stock markets (Kristjanpoller & Minutolo, 2015). The normal distribution of returns indicated that return distribution is symmetrical. It is clear to estimate expected gain and loss. The historical volatility can measure by standard deviation of past prices which utilized as risk gauge (Sen, Singh, & Mazumder, 2017). For the measurement of historical volatility, the closing prices are considered. Parkinson (1980) provides the high and low prices as a better real volatility estimation. This measurement can analyze the high frequency data. Several models have been constructed for the forecasting of volatility dynamics. Engle (1982) introduced the autoregressive conditional heteroskedasticity (ARCH) which extended by Bollersev (1986) to Generalized ARCH (GARCH) model (Engle & Patton, 2007). The purpose of these models is to introduce explicit return variance modelling.

Several proxies are measured the stock price volatility. Schwert (1989) suggests a realistic proxy for stock volatility using a percentage of change in stock price. Some researchers use the standardized covariance of the stock return and the market portfolio such as S&P 500, known as Beta (B) (Beaver, Kettler & Scholes, 1970; Chiou & Lee, 2009), while Parkinson (1980) comes up with a calculation which uses the difference between the high prices and low prices a year divided by the average of the same highest and lowest prices. Here is the table below provide the crux of stock price volatility measurement.

Efficient Market Hypothesis

Market efficiency is most important capital market theory. First time, Fama (1965) stated the efficient market, he proposed that markets have all current information with freely access for all participants and also there is large number of rational individuals and maximum profit gaining approaches available who always tried to compete with each other and forecast the future value of securities. During 1970, Fama introduced efficient market hypothesis which is more acceptable and empirically tested in different ways and situations. Fama (1970) described that a market where firms can make decisions and also investors can select the securities of firms with all available information. The securities and share prices reflect the all information about company. Similarly, the company shows

their resources as a signal in capital market, the share price is known as best signal for investment. Fama did not only presented a theory, he also provided the empirical evidences. His research based on prior studies and some models including, random walk model, fair game model and expected return model. There is some assumption of this hypothesis: 1) for trading securities, there is no transaction cost 2) for all market participants, all information is freely available 3) For future prices of each security, and all participants follow the current prices information. In fact, prices reflect the information of firms in markets for investors. Investors made decisions on the basis of companies share prices in stock markets. Investors always look for high return rate (Garleanu & Pedersen, 2018). There are three types of efficient markets, weak form, semi- strong form and strong form efficiency.

Weak Form Efficiency: It is the most important form of market efficiency. Fama (1991) did also more work on this form and update it. The new updated weak form is known as "return predictability test", escalation of returns forecasting with other variables such as dividend yield and interest rate included in it. The weak form efficient market proclaims that share prices in the stock market reflects the information which based on past history of prices, short interest and trading volume. This form also avoids the trend analysis (Garleanu & Pedersen, 2018).

Semi-strong Form Efficiency: Fama (1970) stated "semi-strong form efficiency that the price efficiency is considered as a publicly available information. The price of stocks fully reflect the available information to public. This type of efficiency is also known as event studies (Fama, 1991).

Strong Form Efficiency: It is the extreme hypothesis, it denotes the semi strong information and other all information to the corporate insiders in the market. Fama (1991) described that corporate insider can have all private information for the purpose of profit increment.

Discussion

Prior studies empirically test the stock price volatility with other factors in developed and developing stock markets. Oh, Lau, Chin and Mansor (2012) studied the volatility co-movements of the ASEAN-5 equity markets. The five ASEAN markets were represented by JSX (Jakarta), KLSE (Malaysia), PSE (Philippines), SET (Thailand) and SEX (Singapore). Data for a period of 21 years between January 1987 and December 2010 were analyzed and tested using the GARCH modelling framework. They also conducted tests on two sub-periods i.e. pre-crisis (1987-1997) and post-crisis (1997-2010). Their findings indicated that volatility during the pre-crisis period was partially integrated but was totally integrated during post-crisis period.

Engle and Patton (2016) used the daily closing price data of the Dow Jones Industrial Index (DJIA) from August 2010 to August 2015 to identify a good volatility model which can forecast and capture commonly held stylized facts about conditional volatility. They used the simple GARCH (1, 1) model for their analysis. They found that the volatility of the DJIA was quite persistent and mean-reverting, negatively lagged return innovation

had impact on conditional variance and higher interest rates lead to higher equity return volatility.

Sumathi & Maheswari (2017) explored the transmission of volatility between the stock and bond markets in NSE (National Stock Exchange) during 2010 to 2015. They used daily data closing prices for volatility. They analyzed the volatility by the GARCH (1, 1), EGARCH (1, 1) and TGARCH (1, 1) framework to selected representative stock indices. The analysis indicates a long persistence of volatility in selected indices after the financial crisis in 2008.

Panda and Deo (2017) explores the spillover effect of volatility during pre-crisis, post-crisis, in-crisis periods between rupee-dollar exchange rate and CNX return series. This study found asymmetry volatility spillover in all the three periods. It was higher asymmetry and volatility spillover effect during the post-crisis period as compared to two other periods

Zainudin, Mahdzan, & Yet (2018) examined the effect of dividend policy on stock price volatility in Malaysia by taking 166 industrial product companies during 2003 to 2012. They measured the volatility by Parkinson formula. Their study found that dividend policy is strong predictor of stock price volatility in Malaysia for industrial product companies.

Alrjoub & Alrabba (2018) observed that dividend policy affects stock price volatility in the Amman Stock Exchange during 2010-2016. This study measured the stock price volatility by Parkinson formula. They analyzed the data by using panel GMM. They found that dividend policy shows significant effect on stock price volatility. It is suggested that firms should maintain dividend policy for investors.

Conclusions

This study attempts to discuss the concept and measurements of stock price volatility. This study also provides the empirical review of stock price volatility. The different types of volatility is due to different circumstance such as historical volatility is for past daily closing prices, implied volatility is for option prices, indices volatility is for indexes and intraday volatility presents the trade day fluctuation. This study indicates the measurements of volatility including standard deviation of returns, difference between high and low stock prices, Parkinson formula and GARCH. By the review of literature, this study found GARCH and Parkinson is most reliable measurements up till now. This study suggests the investors to measure the volatility for their portfolio investments. Investors should focus on volatility and its external and internal effects. This study is limited to the available literature on stock price volatility measurements. The future study can implement these all measurements and empirically test the differences in measurements of volatility.

References

Adam, K., Marcet, A., & Nicolini, J. P. (2016). Stock market volatility and learning. *The Journal of Finance*, 71(1), 33-82.

Alrjoub, A. M. S., & Alrabba, H. M. (2018). The effect of dividend policy on stock price volatility: empirical evidence from Amman stock exchange. *Academy of Accounting and Financial Studies Journal*, 22(2).

Andersen, T. G., & Bollerslev, T. (1997). Heterogeneous information arrivals and return volatility dynamics: Uncovering the long-run in high frequency returns. *The Journal of Finance*, 52(3), 975-1005.

Antoniou, A., & Holmes, P. (1995). Futures trading, information and spot price volatility: evidence for the FTSE-100 stock index futures contract using GARCH. *Journal of Banking & Finance*, 19(1), 117-129.

Arthur, W. B. (2018). Asset pricing under endogenous expectations in an artificial stock market. *In The economy as an evolving complex system II*, 31-60.

Barberis, N., Greenwood, R., Jin, L., & Shleifer, A. (2015). X-CAPM: An extrapolative capital asset pricing model. *Journal of Financial Economics*, 115(1), 1-24.

Beaver, W., Kettler, P., & Scholes, M. (1970). The association between market determined and accounting determined risk measures. *The Accounting Review*, 45(4), 654-682.

Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity. *Journal of econometrics*, 31(3), 307-327.

Campbell, J. Y., & Shiller, R. J. (1988). Stock prices, earnings, and expected dividends. *The Journal of Finance*, 43(3), 661-676.

Carceles-Poveda, E., & Giannitsarou, C. (2008). Asset pricing with adaptive learning. *Review of Economic dynamics*, 11(3), 629-651.

Chiou, J. S., & Lee, Y. H. (2009). Jump dynamics and volatility: Oil and the stock markets. *Energy*, 34(6), 788-796.

Deng, Y., Liu, X., & Wei, S. J. (2018). One fundamental and two taxes: When does a Tobin tax reduce financial price volatility?. *Journal of Financial Economics*.

Dewasiri, N. J., & Banda, Y. W. (2015). Dividend Policy and Stock Price Volatility: An Error Corrected Approach. *Asia-Pacific Journal of Management Research and Innovation*, 11(3), 165-171.

Engle, R. F., & Patton, A. J. (2016). *What good is a volatility model?. In Forecasting Volatility in the Financial Markets* (Third Edition), 47-63.

Fama, E. F. (1991). Efficient capital markets: II. *The Journal of Finance*, 46(5), 1575-1617.

Fama, E. F. (2017). *The Fama Portfolio: Selected Papers of Eugene F. Fama*. University of Chicago Press.

Fama, E. F., & French, K. R. (2004). The capital asset pricing model: Theory and evidence. *Journal of Economic Perspectives*, 18(3), 25-46.

Fama, E. F., & MacBeth, J. D. (1973). Risk, return, and equilibrium: Empirical tests. *Journal of Political Economy*, 81(3), 607-636.

Garleanu, N., & Pedersen, L. H. (2018). Efficiently inefficient markets for assets and asset management. *The Journal of Finance*, 73(4), 1663-1712.

Hussainey, K., Oscar Mgbame, C., & Chijoke-Mgbame, A. M. (2011). Dividend policy and share price volatility: UK evidence. *The Journal of Risk Finance*, 12(1), 57-68.

Jurado, K., Ludvigson, S. C., & Ng, S. (2015). Measuring uncertainty. *American Economic Review*, 105(3), 1177-1216.

Koudijs, P. (2016). The boats that did not sail: Asset price volatility in a natural experiment. *The Journal of Finance*, 71(3), 1185-1226.

Kramer, J., & Chen, J. (2010). Title of the Article. *Journal Name*, 110-313.

Kristjanpoller, W., & Minutolo, M. C. (2015). Gold price volatility: A forecasting approach using the Artificial Neural Network–GARCH model. *Expert Systems with Applications*, 42(20), 7245-7251.

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

Melvin, M., & Yin, X. (2000). Public information arrival, exchange rate volatility, and quote frequency. *The Economic Journal*, 110(465), 644-661.

Padmakumari, L., & Maheswaran, S. (2017). A new statistic to capture the level dependence in stock price volatility. *The Quarterly Review of Economics and Finance*, 65, 355-362.

Panda, P., & Deo, M. (2014). Asymmetric cross-market volatility spillovers: evidence from Indian equity and foreign exchange markets. *Decision*, 41(3), 261-270.

Rady, D. A. M. (2012). Greece debt crisis: Causes, implications and policy options. *Academy of Accounting and Financial Studies Journal*, 16, 87.

Schwert, G. W. (1989). Why does stock market volatility change over time?. *The Journal of Finance*, 44(5), 1115-1153.

Sen, S., Singh, B. M., & Mazumder, S. (2017). Efficient Market Hypothesis: A Study on Indian Capital Market. *Research Bulletin*, 42(4), 69-79.

Sumathi, D., & Maheswari, M. U. (2017). Stock Price Volatility in NSE Indices: Post Finance Crisis. *International Journal of Research in Finance and Marketing*, 7(5), 78-87.

Tang, H., & Xu, X. E. (2013). Solving the return deviation conundrum of leveraged exchange-traded funds. *Journal of Financial and Quantitative Analysis*, 48(1), 309-342.

Watson, J., Taylor, A., Haffman, T., Jorge, A., Sulivan, B., Chung, D., et al. (2009). *Title of the Book.* New York: Publisher.

Zainudin, R., Mahdzan, N. S., & Yet, C. H. (2018). Dividend policy and stock price volatility of industrial products firms in Malaysia. *International Journal of Emerging Markets*, 13(1), 203-217.