**FIRM LEVEL STOCK RETURNS VOLATILITY**

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**ABSTRACT**

This paper analyzes the level of stock returns volatility and identifies causal relationships across different economic sectors in Bursa Malaysia. We found dissimilarities of average stock returns volatility between sectors where firms in the Technology sector exhibit the highest stock returns volatility while firms in Telecommunication sector show the lowest volatility.

**Keywords**: Stock returns volatility, Volatility persistence, Leverage effects, Causal relationship.

**1. Introduction**

Analyzing stock market volatility is crucial for firms and investors in order to assess the level of risks in the stock market. Rohani (2014) argues that risk is the chance where actual return may differ from what is expected, and that investment return with higher volatility is riskier than investment with lower volatility. Volatility possesses a major threat in the stock market as an increase in volatility causes the demand of stock to fall due to its high risk.

The remainder of this paper is organized as follows. Section 2 discusses previous literatures on volatility estimation in Malaysia and portfolio diversification. Section 3 describes the dynamic volatility estimation of EGARCH, the asymmetric nature of stock returns volatility, and causal relationship assessments. Section 4 shows the estimation results, and Section 5 concludes.

**2. Literature Review**

2.1 Stock Market Volatility in Malaysia

Jie (2007) analyzes the stock price and returns volatility of Malaysia based on weekly sample from January 1977 to February 2007 for both Kuala Lumpur Composite Index (KLCI) and Exchange Main All Shares index (EMAS) by utilizing the GARCH, EGARCH and TARCH models. Jie (2007) argues that the volatility of stock price in Malaysia is not highly persistent and this is often observed in high frequency financial data.

**3. Data and Method**

The current paper uses secondary data acquired from the Thomson Reuters Datastream. Individual firm stock prices listed in Bursa Malaysia, formerly known as the Kuala Lumpur Stock Exchange (KLSE), are obtained. Several other online databases are also utilized to retrieve supporting data important for the study. All firms listed in the Bursa Malaysia that have 20 years (1995 until 2015) of monthly data availability and without outliers, are included.

This current paper utilizes the Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) to analyze stock returns volatility of Malaysia. EGARCH is constructed by Nelson (1991) as a method to analyze dynamic volatility and is extended from the Autoregressive Conditional Heteroskedasticity (ARCH) model introduced by Engle (1982) over the concerns of variance that changes over time. Consider a conditional distribution of individual firm excess returns ($r\_{it}- r\_{ft}$) as shown below[[2]](#footnote-2):

|  |  |
| --- | --- |
| $$r\_{it}- r\_{ft}= α\_{i}+β\_{i}X'\_{it}+ u\_{it}$$ |  (1) |

**4.0 Results**

4.1 Stock Returns Volatility Average for the Economic Sector

Table 1: Average Stock Returns Volatility for The Economic Sector

|  |  |
| --- | --- |
| **Economic Sector** | **Average Stock Returns Volatility Level** |
| Basic Materials | 0.031379 |
| Consumer Cyclical | 0.02604 |
| Consumer Non-Cyclical | 0.019018 |
| Energy | 0.016909 |
| Financial | 0.023319 |
| Healthcare | 0.030562 |
| Industrials | 0.025729 |
| Technology | 0.084136 |
| Telecommunication | 0.006599 |
| Utilities | 0.016296 |

Note: The average stock returns volatility is obtained from average volatility of firms in each economic sector. The average stock returns volatility are significantly different between 10 economic sectors where P-values for the standard ANOVA and the Welch adjusted ANOVA are near zero.

As shown in Table 1, firms in Technology sector exhibits the highest stock returns volatility compared to other economic sectors, followed by firms in Basic Material and Healthcare sectors. In contrast, firms in Consumer Non-Cyclical, Energy, Telecommunication and Utilities enjoy lower risk as shown by the smaller average stock returns volatility. Interestingly, the average volatility in the Financial sector is relatively low compared to other risky sectors, although the financial market is perceived to be the most volatile when taking into account multiple economic recessions linked to the instability of financial market, such as the 1997/98 Asian financial crisis and the U.S. subprime mortgage crisis in 2008.

**5.0 Conclusion**

Based on this study, the decision to invest in an economic sector should be considered carefully. Dynamic stock returns volatility analysis shows a significant dissimilarity of stock returns volatility level across economic sectors where firms in Technology, Basic Material and Healthcare sectors on average suffer from higher volatility compared to other sectors. Stock returns volatility is also persistent in all economic sectors where current volatility is highly impacted by previous stock returns volatility.

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2. The current analysis uses ARCH, specifically the EGARCH model, to estimate stock returns by taking advantage of its ability to capture stylized features of the real-world volatility compared to static standard deviation methods of volatility estimation. [↑](#footnote-ref-2)