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Stock Market Volatility – Conceptual Perspective through Literature Survey

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Abstract

In recent years, understanding the volatility has become more significant among investors. They are concerned about the risk and returns on their investment. Investors are basically induced by the flow of information which is closely related with volatility of stock prices. This study intends to understand the characteristics of volatility with the evidence from survey of literatures made available. This study also provides the insight of cause and effect of volatility of stock prices and also attempts to bring out various features of volatility such as volatility clustering, mean reversion and degree of volatility persistence. It is found that factors like information flow, trading volume, economical aspects and investor's behaviour are the causes of volatility in the stock market. It also suggests that the stock markets around the world have evidenced asymmetry response and spillover effects of volatility.

Keywords: *Volatility, Asymmetry response, spillovers, clustering, leverage and contagion.*

1. Introduction

The importance of understanding the behaviour of volatility in stock market has received significant attention among researchers and analysts. Investors invest into the stock market with an expectation of getting reasonable returns that involves risks. The trade-off between risk and return is the key concept in financial asset pricing. The measure of risk related with financial assets is the volatility of asset return.

The risk and return are positively related, and should have positive relationship between expected return and uncertain volatility of returns and negative relationship between unexpected volatility and realized returns. The latter relationship occurs when unexpected increase in volatility improves required rates of return which in turn causes a decline in prices of stock (Whitelaw, 1994, PP.515-6). Rajput & Kakkar (2012) interpret the volatility as a measure of difference between an asset current prices and its average past prices. Volatility is standard deviation of returns, which measure the distribution of returns from the average. If there is wide range of fluctuations in the prices over short time periods, it has high volatility and has low volatility if the price moves slowly.

2. Methodology

This study intends to understand the term volatility and its characteristics with the evidence of reviewed literatures. We adopted this method as it brings out continuous updated proof in stock market trends. Capturing the reasons for volatility in each stock market situated in different countries is easy through scanning series of research papers. Another observation we place here is the crux of the issue tested by various authors brings out a more pronounced facts. Taking these obvious relations, the present study provides the insight of cause and effect of volatility of stock prices in the market. Volatility of financial market returns is understood as 'the variability of asset prices which is induced by changing investors' expectations due to flow of information to the market'. Such information (good or bad news) may be macro-economic issues such as changes in inflation rates, growth rates, government policies and interest rates, sector or company specific such as foreign investments, mutual funds, investment trends, periodical reports, mergers and acquisitions, dividend declarations etc. How far these macro-economic and company specific factors causes the price fluctuations in different countries are presented below.

3. Purpose of the Study

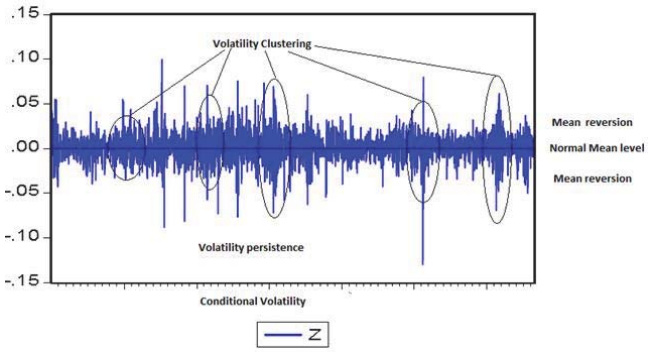
Stock markets in India are recently in news for all the bad reasons. The one important reason is unpredictable volatility observed for painful long period. Investors losing their money and traders getting into margin crisis have prompted the government institutions to relook the regulatory measures. However, this heavy fluctuation in Indian market is not a new story. It had its origin back in 1990's. All the types of interim measures did not solve this issue, but continue to capture the limelight of all the newspapers. This gave us an idea that in a matured and developed stock market, this volatility would not disturb the investors. Hence, we thought of surveying the research on stock market volatility. From this, we could be able to list out the reason why it is similar or dissimilar in different countries.

4. Characteristics of Volatility

Rakesh kumar (2007) examined volatility trend of Indian stock market from 1996 to 2005 by using daily and monthly data of returns. The study observed high volatility during the decline period (1996-1999) and recession period (2000-2002) period and moderately less volatile during the economic growth period (2003-2005), since the investors are largely response to economic aspects.

To measure the associated risk, a class of models of volatility are required. Suchismita Bose (2007), in the literature of finance, broadly accepted models of volatility are ARCH (Autoregressive Conditional Heteroscedasticity) and GARCH (Generalised Auto regressive Conditional Heteroscedasticity), which estimates the variance of the forecasted return based on past forecast errors as well as past estimates of volatility It is commonly understandable, because the markets are highly integrated; the volatility of one asset market consistently spills over to other asset market and any market disturbances in developed countries are transmitted, causing higher volatility across other global markets.

The main feature of volatility of asset prices is the collection of small and large moves of asset prices called Volatility Clustering and today's volatility shocks will influence the expectation of future's volatility. Bose (2007) examined the characteristics of return volatilities and suggests that *Volatility clustering* means the large changes of prices (variance of returns) for a period are more likely to be followed by further large changes, the high volatility tend to preceding for a while after the initial shock and similarly, a period of low volatility is likely to follow small changes. Each asset has its own underlying volatility level thus shocks of volatility will effects the returns of that asset to its mean level; termed as *Mean reversion.* This effect of shocks for an underlying asset will take a long time to recover to its normal mean level, thus such return series is characterised by a level of *volatility persistence*.



5. Causes for Volatility of Prices in Stock Market

The stock markets have high fluctuating stock prices, which exhibit volatility; bring variation in the returns of the investors' investment. The prices of stocks are changing for every day where the buyers and sellers are actively participating in the market with the intension of making some returns and decide how valuable their stocks are. If more investors want to buy (sell) a stock than to sell (buy) it – the prices moves up (down) and these price movements will determine the return and volatility of the stock market. It is more important to know the factors influence them, what exactly causes the investors to behave the way they do, and it is documented that 'investors are largely receptive to economic aspects'.

Ramanthan and Gopalakrishan (2013) suggests several factors that influence the price movements such as latest

information on the stock prices, inflation, economic strength of market and peers, psychological issues, supply and demand (liquidity) and uncertainty of company's future (even without information).The flow of information is a vital factor in the movements of the stock prices, which is associated with the volatility (Ross 1989).

Jones, Kaul, Lipson (1994) investigates the effect of the information flow on the behaviour of stock prices and suggests that the public information is the major source of short-term return volatility. The investors react and interpret to the immediate information, adjust the market prices up or down leads to high fluctuations (volatility) in the market. The volatility is also associated with trading volume and trading opportunities and various market and non-market components. Berry and Howe (1994) found positive, reasonable relationship between public information and trading volume, but an insignificant relationship with price volatility and they also emphasized intraday flows and news releases by Reuter's News Service per unit of time used as a measure of public information arrival. The pattern of volatility persistence is the one most significant characteristics of volatility.

Andersen and Bollerslev (1997) analyzed a one-year time series of five-minute Deuchemark-U.S. Dollar exchange rates and found a degree of volatility persistence for high intra-daily returns and low frequency inter-daily returns. Foster and Viswanathan (1993) found that the actively traded firms, trading volume, adverse selection costs and return volatility were high during the first half hour of the day by using intraday data of New York Stock Exchange.

Since the behaviour of stock returns volatility is influenced by economical and institutional changes, the market liberalization also have an impact on the patterns of volatilities of stock returns. The stock markets are integrated with each other and thus the information flows are directly associated with the variance of price changes (Ross 1989). With the increase of rate of flow of information across the markets, the market liberalization can increase or decrease the volatility in the market.

French and Roll (1986) indicate that more information is released when markets are open than when they are closed, and the stock prices are more volatile in the period when the markets are open for trading. Sa Young Lee (1998) investigate that market liberalization does not impacts on volatilities of stock returns in the Korean market and the conditional heteroskedasticity of variance in the Korean stock market index return series was studied for the period between 1977 to 1994. All the daily, weekly and monthly return series exhibit volatility clustering, and some degree of volatility persistence in the Korean stock return data.

6. Asymmetric Response and Volatility Spillovers

Many empirical studies found that there are asymmetrical changes in the stock prices for a given event or shock leads to considerably higher volatility in the stock returns. Investors respond more sensitively to bad news rather than good news, which cause high volatility in the stock prices.

Black (1976) investigated leverage effect on volatility and found it had strong negative correlation between stock price changes and volatility response – stocks volatility likely to be increase when stock prices declines. The leverage effect suggests that if there is a decrease in stock price of a company, it reduces the value of equity comparative to debt, and increases the financial leverage and thus increases the risk of holding the equities, which in turn increase the future volatility. In contrary, Schwert (1989) argues that leverage alone cannot influence asymmetric volatility response.

Due to the strong financial market linkages, the volatility of one stock market spill-over to another stock market, and the information of market movements are transmitted to all around the world. Several empirical studies have proved and suggest that, 'volatility shocks in the developed stock markets have significant impact on the returns and volatility spillover effects on emerging stock markets including India'. Kumar and Mukhopadyay (2002) found significant relationship in return and volatility spillover from US to India by using Granger causality test and Univariate GARCH models.

Likewise, most of the studies like Kim (2005), Wang (2005), Mukherjee and Nath (2008), Yu and Hassan (2008) etc., have examined the volatility spillover effect between the developed markets with US markets, had a unidirectional volatility spillover from US markets to other markets.

Bhar and Nikolova (2007) examined the mean and volatility spillover effect from Brazil, Russia, India and China (BRIC) countries stock market to world markets and to regional stock indices, and found that the world stock index have an effect on the mean returns and volatility of BRIC countries stock indices and regional markets have more volatility spillover effect compared to world markets.

Mishra et al. (2007) found bi-directional spillover effect between the Indian stock market and US (foreign exchange market). Mukherjee and Mishra (2008) investigate the market integration and volatility spillover effect between Indian stock market and 12 other Asian stock markets, and found bi-directional intra-day spillover effect between Indian stock market and its counterparts and there was no immediate communication of information between the markets.

Suchismita Bose (2007) use daily data of S&P CNX Nifty index from June 2000 to March 2007 and found significant asymmetry response during the period of market retreats and advance, with increasing volatility during the times of market decline (2000-2002) being sharper and more persistent. Similarly, Singh et al. (2008) examined the price and volatility spillover between India and other markets and observed volatility spillover effect from Hong Kong, Japan, Korea, Singapore and US to the Indian market.

Badhani (2009) analysed the daily closing values of S&P 500 (US market) and S&P CNX Nifty (Indian) indices from January 1996 to September 2008. This study indicates a significant asymmetry response on returns and spillover effects on volatility; the returns in Indian stock market are more responsive to negative shocks in US market than the positive shocks and the positive shocks effect on the volatility.

Sarkar, Chakrabarti and Sen (2009), examined the relationship between Sensex, Dow Jones, FTSE, BVSP, MerVal and JKSE, found the volatility in the developed market indices affects the Sensex volatility, proved a worldwide contagion. Sensex volatility is also correlated to some degree of the volatility of the Jakarta Stock index, indicating toward some kind of regional contagion and impulse-response function shows, a shock in Dow Jones, the Jakarta stock index and BVSP has a reflective effect on Sensex.

Al-Zeaud and Al-shbiel (2012) examine the spillover effect between US and Major European stock markets, found spillover effect from London market to New York, Paris and Frankfurt stock markets, and within European stock markets there are unidirectional volatility spillover effect from Frankfurt to Paris, and Paris to London, where bad news induced volatility are transmitted more strongly the volatility declines.

Sen and Bandhopadhyay (2012) explored a bi-directional contemporaneous as well as dynamic return and volatility spillover from US Stock Market to Indian stock markets and vice versa. Sakthivel et.al (2012) also found bi-directional volatility spillover between S&P 500 and BSE Sensex, and uni-directional volatility spillover from Japan and UK to India.

Panda and Deo (2014), investigates the volatility spillover effect during pre-crisis, post-crisis, in-crisis periods between rupee-dollar exchange rate and CNX return series and 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.

7. Finding

This study attempts to provide a conceptual framework of stock market volatility with the evidence of several literatures. It is found that if there is a wide range of fluctuations in the prices over short time periods, it has high volatility and if the price movements are slow it has low volatility. The study suggests that the investors induce the variability of prices in the stock market by interpreting the flows of information. Thus, the flow of information is closely associated with volatility of prices. Negative shocks (news) will influence high volatility than the positive news. Volatility is also related with various aspects such as economic growth rates, companies announcements, dividend declarations, psychological issues, trading volume etc., where the investors immediately reacts to these factors and influence the volatility of stock prices.

This study also explains the main features of volatility i.e., volatility clustering, mean reversion and degree of volatility persistence in the prices of stock market. It is found that the volatility of one stock market is transmitted to other stock markets due to the market integration. From the survey of literatures, the study explores asymmetry response and volatility spillover effects among the markets. We find more response and spillover effects from developed markets to emerging markets. There are varied opinions from the literatures, ranging from unidirectional volatility spillover effects to bidirectional volatility spillover effects among the stock markets.

8. Conclusion

This study attempts to understand the concept of volatility in the prices of stock market and tries to understand the cause and effects of volatility. The important features of volatility are to go through the factors influencing causes of volatility but there are no fixed set of factors are responsible to the volatility trend. The study suggests that the investors must be aware of factors causing the volatility in the market and should think whether it is from internal or from external (spillover) and respond according to the situation. The study is limited only to the available literature on this specific area, but the scope for further investigation is very high with which one can extend their interest to measure the volatility, impacts of on volatility, volatility feedback effects. There is no limit for qualitative research in stock market if an investigator takes this volatility spill over as a focus area.

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