

Volatility Spillover Among Market Indices: Evidence from Pakistan's Stock Exchange

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Abstract

The study aims to investigate the return and volatility spillover of markets after the financial crisis (2007-2008) alongwith its widespread global impact. The return and volatility spillover specific to Karachi Stock Exchange-30 and Karachi Stock Exchange-100 is of significance to corporations, portfolio management firms, mutual funds management firms and investors, as they invest over the benchmark - Karachi Stock Exchange-100 performance and they totally ignore Karachi Stock Exchange-30 index, which derives more than 50% of market capitalization. The findings of study, based on daily data from 30th June 2009 to 31st December 2018, analyzed using financial econometrics models, GARCH, MGARCH, and ARMA, show the return spillover between Karachi Stock Exchange-30 and Karachi Stock Exchange-100 with no effect of volatility spillover. Resultantly, investors, corporates and fund management organizations are benefitted in terms of tracking return patterns that initiates due to companies' performance comprising Karachi stock exchange index-30 and not the Karachi Stock Exchange index-100.

Key Words: Volatility Spillover, Karachi Stock Exchange-100, Karachi Stock Exchange -30, Market Capitalization, Investor's Sentiment

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sectors.

1. Introduction

Pakistan is facing downward pressure of reserve as stated by State Bank of Pakistan (SBP). Market indices are one of the means used by investors following which investors make their decisions. The concern is to mitigate investor's pessimistic perceptions on their investment by means of true information about market indices of Pakistan stock exchange (PSX). The behavior of any stock market is a matter of volatility. Investors react nervously toward major macro-economic matters and events. One way of measuring it is standard deviation. The greater the dispersion in value of stocks greater the fluctuation in returns would be and hence

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would cause greater financial risk in investments. Spill-over effect refers to the situation when one country's stock exchange happenings lead the fluctuation towards other countries stock exchanges. There are positive and negative spillover but the term is most commonly applied and referred to the negative impact a domestic event has on other parts of the world. For example, if consumer spending in the United States declines, it has spillover effects (overflow) on the economies that depend on the U.S. as their largest export market. The larger an economy is the more spillover effects it is likely to produce across the global economy, for instance, crisis of 2008-2010 (Habiba, 2020). Volatility in term of stock prices refers to the tendency of stock prices to go up or down as a result of significant financial, political or socio-economic happenings in the country (Zaidi, Khan, Khan, Rehman, Alonazi, Noman, 2023). Increased volatility is considered to be unhealthy for investor's wealth and value of assets in possession as it indicates more financial risk towards it. If fundamental economic factors do not explain the increased level of volatility by the same level of factors fluctuations, then this volatility has a tendency to give misinformation and in result would lead towards stocks to be mispriced and so the misallocation of investments. Return and volatility spillover is explained in terms of one firm is affected by return and volatility of other firm then this phenomenon is named as return and volatility spillover (Zaidi et. al., 2023). Researchers have been working on it to provide sufficient evidence of its existence in markets and have found, if two firms belong to the same market then the evidence of spillover (either in return or volatility), would be called "Heat wave effect". The same concept of spillover is taken towards the different markets and is named as Meteor Shower effect.

Pakistan has gone through several financial reforms in last two decades. The two major reforms were to establish Karachi Stock Exchange Index-30 and the demutualization of three stock exchanges named as Lahore Stock Exchange, Karachi Stock Exchange, Islamabad Stock Exchange, all limited by guarantee exchanges through the notification on 11, Jan 2016



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(Sharif, 2017). This also led to promulgation of Securities Act, 2015. The new law has several securitization schemes to govern market fairly and to prevent any market abuses and manipulations.

The Pakistan Stock Exchange (PSX) exhibits significant spillover effects from global indices, particularly during financial crises. For instance, the MSCI index and global crude oil prices have been identified as major influencers, with the financial sector acting as a net transmitter of volatility (Zaidi et al., 2023). It is now essential to carry out research concerning the return and volatility spillover among indices of Pakistan Stock exchange (Karachi Stock Exchange Index -100 and Karachi Stock Exchange - 30), to check the in-between manipulation of these indices for instance Karachi Stock Exchange -100 being the market representation and Karachi Stock Exchange Index – 30 adjusting the dividend rights while other considering the total markets returns. By using different econometric models such as GARCH, ARCH, Q stats, t-Statistics. This paper aims to address investors' sentiments and to guide them to the unattended and hidden complexity of the indices that play a major role in misguiding the new investor and general public as customers.

Our research addresses the following objectives:

1. To investigate the dynamic linkages of return and volatility spillover between Karachi Stock Exchange Index – 30 and the Karachi Stock Exchange Index -100.
2. To gauge whether the volatility of individual stocks is influenced by the volatility of the financial market

The development of financial sector in Pakistan, most of the time is represented by Karachi Stock Exchange Index -100 with the total ignorance of Karachi Stock Exchange Index – 30, which was announced with the aim that investors would look forward to this Karachi Stock Exchange Index – 30 for financial development and economic growth of country.



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This led us to the investigation of above-mentioned case of Karachi Stock Exchange Index – 30, Karachi Stock Exchange Index -100 and which resultantly became a reason to conclude that there is a positive relationship of two indices (Karachi Stock Exchange Index – 30 and Karachi Stock Exchange Index -100) Muhammad Ahsanuddin, (2019). This is worth mentioning here that these indices of same market with specifications of sector and companies act in same manner justify the inelastic collusion or in other words, the first 30 place of companies in Karachi Stock Exchange Index -100 are same as the top 30 companies in the Karachi Stock Exchange Index – 30. The paper employs various econometric techniques modelling for the estimation of returns and volatility spillovers of Pakistan Stock Exchanges (PSEs). It is of importance to know here that Stock Exchanges were demutualized, and it was predicted that market would remain strong and will not be disseminating the information.

2. Review of Literature on Volatility Spillovers

The literature review summarizes the work done on return and volatility spillover in national and international context and helps provide evidence that even if countries are lying away from each other geographically, the return and volatility spillover in markets exists and its increased relationship between markets is fatal for investors and corporations. Several studies have been completed justifying the market's return and volatility spillover throughout significant financial events (Abro, Abubakar, Shahid, & Fatima, 2024; Ghouse, Khan, & Arshad, 2019).

Due to increase in demutualization of markets worldwide, realizing the importance of volatility spillover for the investor's decision of investment has significantly impacted the research. In doing so, the concept of spillover has also been searched in Exchange Traded Fund (ETF) markets. Acharya (2019) has found in his research that modern-day ETFs have also return spillover against their benchmark. Stock markets integration and dynamics of



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volatility spillover plays a major role in today's world in deriving investor's sentiment. This has been studied by Khan (2023), who concluded that since volatility spillover is being spread over by the Indian Stock markets to BRICS nations, so the investors of India will not be able to diversify investments if they do invest in countries comprising BRICS. This study shows the notion that investor seemingly has diversified their portfolio may still may not have the result of maintaining a portfolio when they in terms of mitigation of risk and maximizing returns.

The return shocks though remain normal in normal conditions, have the tendency to take the extreme turns. This financial crisis, seemingly in a period, had a spillover effect lasting for years from West to East due to the interconnectedness of stock markets in the world. Oliyide (2023), in his research concluded return shocks spread at a higher magnitude during extreme market conditions relative to normal periods. Additional analyses show the behavior of return transmission between green bond and other assets is asymmetric.

First, using the spillover index, the authors find evidence that the S&P 500 was a net transmitter of volatility from oil and gold markets, but a net receiver of volatility from Bitcoin. Return spillovers from crude oil were transmitted first to gold, and Bitcoin markets and return spillovers from gold were transmitted to Bitcoin. Hung, (2021) stated, nonlinear causality tests provide us further insights into the lead-lag interconnections among the four key considered variables from the economic perspective. Specifically, a close inspection of these empirical results, the integration of the four key assets is significant. It is no different than presence of volatility spillover in Pakistan stock exchange. Though the Karachi Stock Exchange -30 is adjusted against dividends, however; the presence of top 30 companies in its composition poses volatility spillover that could easily transmit volatility spillover. In case of Pakistan, the research of Muzammil hassan, (2023) founded bilateral casual relation between macro-economic variable using EGARCH and GARCH models. It explored uncertainties of macroeconomic variable with



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the Pakistan Stock Exchange having Karachi Stock Exchange -100 index as the only representator of the market.

On the other hand, Brazilian economy that could be in line to Pakistan's economy considering different economic factors, has the presence of connectivity among the returns of sectoral indices. It is of the Brazilian Capital market in which Mathias Schneid Tessmann, (2024) stated there is 66% of overall connectivity between financial and non-financial sectoral indices with a peak of 88%. This has not only been the general case of stock markets. It is evident in the research of Kim Hiang Liow, (2023) where he studied the Real Estate property sector of European Real Estate Society. The combined findings of minimal cointegration. It is one exception due to two cross continental sectors, showing how one investor can be benefitted by investing in Asia and Europe addressing the investor's sentiment. Financial crisis has not only impacted the developed world but it had rippling effect on emerging economies. This research of ours would mean meaningless if this is not addressed. In result, the research of Walid Mensi, (2021) look further into volatility spillover between emerging markets and developed world. The result showed the time-varying presence of return volatility spillover among the stock markets, indicating contagion effects.

Pakistan is a developing country and its stock market is classified as emerging market. Emerging markets always have been more prone to impacts driven from the developed world. The research of Khan (2023) shows that there has been high connectedness among all indices. This shows the psychological perception of investors that pertains to their sentiment when it comes to investing in a market and diversifying their investment. The sole purpose of investing is to earn profit but investor see it using diversifying the risk associated with the investment to maximize the profits. Volatility spillover plays a role in such a manner that it hinders the diversification in true sense and create risk for attaining the profit.



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4. Methodology

Pakistan stock exchange was incorporated in 1949 as a company (limited by Guarantee). Under the corporatization and demutualization act of 2012, the stock exchange stood demutualized by the federal government as a public company (limited by shares) as 'Karachi Stock Exchange Limited'. Again, in January 2016 Pakistan three stock exchanges of Pakistan namely ; Karachi Stock Exchange, Islamabad Stock Exchange and Lahore Stock Exchange were demutualized into Pakistan Stock Exchange (PSX), which entails wider spectrum of retail and institutional investors with greater international linkages keeping Karachi Stock Exchange index - 100 as a market representator.

The daily data was extracted from Khistocks.com, a website of business insider, of two indices Karachi Stock Exchanges Index-100 and Karachi Stock Exchange Index - 30 dated from 30th June 2009 to 31st December 2018, Recorder (2024). The daily return was calculated by following the closing points of the Karachi Stock Exchange Index – 30 and Karachi Stock Exchange Index – 100 that alternatively translates to the opening points of the index. For the first day, opening points of the index has been kept Null. In this manner, firstly, the index points of the chosen indices, on the opening and closing of trading days, of the decided period were taken, minus the off days, Sunday's when trading is close. The opening price on the first day and the closing price on the last time of day were taken. Next, the starting points from the ending points were subtracted to determine the index's change during the time period (in our case, of the day). Finally, divided the index's change in points by the opening points. In simpler words, $(\text{Current Points} - \text{Previous Points}) / \text{Previous Points}$.

The reason for using Karachi Stock Exchanges Index-100 for validating spillover is because it is the most recognized and considered representator index of Pakistan Stock Exchange and represents 80% of the market in addition to be the benchmark for investors. However, in this representation of the Pakistan Stock Exchange by means of Karachi Stock Exchange Index- 100,



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has the most of the driving force through Karachi Stock Exchange Index – 30. Because, it includes top 30 most liquid companies and adjusts dividend rights whereas the other indices consider total returns of the market.

The most significance of this research paper lies in its discussion of normal conditions of the economy. For this purpose, the data collected has been kept until Dec 31st, 2018. In 2019, due to Covid-19, the stock exchanges around the world have not been run on the normal course of the business days depicting not the true potential of the market which may meet the criteria of normal condition. There needs to be an insight of whether volatility spillover among sector varies from normal to turbulent times. Here it is of great significance to mention the research of Asif Ali Abro, (2024), stating convincing evidence was found for the presence of volatility spillover among indices throughout the pre to post era of financial crisis in 2008-2015. The models used in this research were ARCH, GARCH, EGARCH, and t-statistic. The research scope was kept within six different sector's daily data, encouraging further study of volatility spillover in indices with comprehensive daily data of indices irrespective of sectors. This research of ours has been done on daily data of Pakistan Stock Exchange after their annual study of post financial crisis era.

4.1 Testing and Deployment

The study utilized ARMA and GARCH (1,1) models along with student t distribution and Q statistics to check for volatility spillover between these two indices as these models provide efficient analysis of volatility spillover effects.

The following equation derives the returns on the basis of which we have conducted our analysis:

$$r_t = \ln(P_t) - \ln(P_{t-1}) \quad (1)$$

Where return is represented by r_t , natural logarithm is represented by $\ln$ and the index of past and existing period are reflected by P_{t-1} and P_t respectively. Arch models are widely used to



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address the issue of volatility and the shocks to volatility. The model was presented by Engle in 1982, he said that variance of the residual term in any time t depends on the square of error terms from past periods. One of the downsides of the ARCH detail, as indicated by (Kroner, 1995) was that it was more inclined like a moving average than an autoregression. Later, the model incorporated the slacked contingent change term as autoregressive term by Tim Bollerslev introducing new set of GARCH models Bollerslev, (1986).

$$r_t = \mu + \sum_{i=1}^m \theta_i r_{t-i} + \sum_{i=1}^n \varphi_i \varepsilon_{t-i} + \varepsilon_t \quad (2)$$

Where $\varepsilon_t = z_t \sigma$, $z_t \sim N(0,1)$

$$\sigma^2 = \omega + \sum_{i=1}^p \alpha_i \varepsilon_t^2 + \sum_{i=1}^q \beta_i \sigma^2 \quad (3)$$

The above- mentioned equations (2,3) denotes the conditional mean and variance equation of GARCH model where, estimated returns are expressed by r_t . The relevant autoregressive and moving average lags are identified through PACF and ACF. Depending upon the partial autocorrelation function and autocorrelation function the ARMA (m, n) structure can be ARMA (1,1), or (1,0), or (0,1) and other structures.

Equation. (3) $\omega > 0$, $\alpha_i \geq 0$, $\beta_i \geq 0$ and $\sum \alpha_i + \sum \beta_i < 1$ completes the eligibility criteria for the model to be considered as variance covariance stationary. Sum of ARCH and GARCH terms represents the determination of shock to volatility is represented by autoregression conditional heteroskedasticity terms.

Bollerslev (1987) relaxed the assumption of normal distribution, where $\varepsilon_t = z_t \sigma_t$ and $z_t \sim t(0,1, \nu)$. Parameter ν , the degree of freedom of student's t distribution, is one added limitation to be



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valued by this model. ARCH-M specification was projected by Robert F. Engle, (1987) to determine the risk premium. The clue in this Mean GARCH model was to include the conditional variance of return into the equation of conditional mean. These models can be linked by capital asset pricing models (CAPM) to work on different financial applications.

$$r_t = \mu + \sum_{i=1}^m \theta_i r_{t-i} + \sum_{i=1}^n \varphi_i \varepsilon_{t-i} + \delta \sigma_{t-1}^2 + \varepsilon_t \quad (4)$$

The distribution is t and standard normal, contingent upon the assumption $\varepsilon_t = z_t \sigma$, $z_t \sim N(0,1)$ or $\varepsilon_t = z_t \sigma_t$, $z_t \sim t(0,1, \nu)$. The positive and significant value of δ will represent existence of risk premium.

$$\sigma^2 = \omega + \sum_{i=1}^p \alpha_i \varepsilon_t^2 + \sum_{i=1}^q \beta_i \sigma^2 \quad (5)$$

The above-mentioned equations (4, 5) are conditional mean equation for M-GARCH model. Both the equations (3, 5) exhibit same restrictions on its parameters.

4.2 Model for Return and Volatility Spillover

To further incorporate return and volatility, we outspread the above model to include the return and volatility of return on Karachi Stock Exchange - 30 index in the conditional mean and variance equation in following way:

$$r_t = \mu + \sum_{i=1}^m \theta_i r_{t-i} + \sum_{i=1}^n \varphi_i \varepsilon_{t-i} + \sum_{i=0}^o \delta_i RKSE30_{t-i} + \varepsilon_t \quad (6)$$



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Where $\varepsilon_t = z_t\sigma$, $z_t \sim N(0,1)$ or $\varepsilon_t = z_t\sigma_t$, $z_t \sim t(0,1, \nu)$. It depends if distribution's assumption of return series is either Student t or standard normal. The optimistic and substantial value of δ will represent existence of risk premium. The following equation gives conditional variance as:

$$\sigma^2 = \omega + \sum \alpha_i \varepsilon_t^2 + \sum \beta_i \sigma^2 + \sum \gamma_i RKSE30^2 \quad (7)$$

The both equations (5,3) have similar limitations on its parameters.

5. Results and Discussions

The results have been shown by means of descriptive statistics that accounts for empirical analysis and moving forward with graphical analysis.

Table 1: Descriptive Statistics

Test	RKSE-100 Statistic	RKSE-30 Statistic
Mean	0.0006	0.0003
StandardDeviation	0.0099	0.0114
Skewness	-0.3969	0.1482
Excess Kurtosis	3.5679	10.898
Jarque-Bera	1294.8	11519
Q-Stat(5)	21.5224	31.1192
Q ² -Stat(5)	281.379	306.941
ARCH1-2	84.102	174.23
KPSS	0.488	0.391

RKSE – 100: Return on Karachi Stock Exchange Index – 100



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The mean in the above table 1, is around zero and for Kwiatkowski-Phillips-Schmidt-Shin (KPSS), As the calculated statistics didn't cross critical values being asymptotic [1% (0.739), 5% (0.463), 10% (0.347)] the test results highly indicate that series of the returns is stationary. The null hypothesis, "series is stationary" is accepted for both of the series.

Skewness is positive for return series of Karachi Stock Exchange - 30 index, which indicates there lie huge portion of the observations below the value of mean. Skewness is not positive for Karachi Stock Exchange - 100 index and is inclined to be negative, which means that above mean values, lie observations in a greater number. Same phenomenon was observed in density plots as well. The excess kurtosis for both the return series is positive. It means that the series are leptokurtic. Ljung-Box–Pierce Q-Statistics and Q^2 - Statistics provided the clue for autocorrelation and occurrence of certain possible ARCH effects

respectively. The probability of the effects of ARCH are spread and regulated by the LM-ARCH test. To explore the Arch effects, in this study we have used effective GARCH model. The p-values show that all of the test statistics are significant.



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Table 2: Return and Volatility Spillover

	Model 1		Model 2	
	R-KSE100 ARMA (1,0) GARCH (1,1)	P-values	R- KSE100 ARMA (1,0) GARCH (1,1) With Return Spillover from RKSE30	p-values
Conditional Mean Equation				
Constant μ	0.0009***	0.0000	0.0003***	0.0000
AR (1) θ_1	0.1478***	0.0000	0.1723***	0.0000
R-KSE30 δ_0			0.8733***	0.0000
R-KSE30lag1 δ_1			0.0078*	0.0332
R-KSE30lag2 δ_2			0.0069*	0.0484
Conditional Variance Equation				
Constant ω	0.0000*	0.0041	0.000002***	0.0000
ARCH (1) α_1	0.154***	0.0000	0.2446***	0.0000
GARCH (1) β_1	0.7958***	0.0000	0.1105*	0.1185
Student (DF)	5.1715***	0.0000	3.9676***	0.0000
Persistence ofShocks	0.9499		0.3551	

*** $p < .01$, ** $p < .05$, * $p < .1$

R stands for Return.

R-KSE means Return on Karachi Stock Exchange Index

In the above table 2, the results for the GARCH type models are given. In the conditional mean

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equation, the contemporaneous effect of the return of Karachi Stock Exchange - 30 index on the return of Karachi Stock Exchange - 100 index is significantly positive and is higher than the effect of lags. It gives an indication that the return of Karachi Stock Exchange - 30 index has positive affect on the return of Karachi Stock Exchange - 100 index. As both the indices are based on market capitalization except the Karachi Stock Exchange is adjusted for dividends, this result was expected. 30 firms that are part of Karachi Stock Exchange - 30 index are also the part of Karachi Stock Exchange - 100 index. Their proportion in the total market capitalization of Karachi Stock Exchange - 100 index is higher and a change in the share price of these firms moves the whole index because these 30 firms happen to have a very high market capitalization (Hussain, 2006). The past information of return on Karachi Stock Exchange - 30 index, although significant, has little role compared to the current information. We have optional significant student t degree of freedom which gives an indication that the tentative idea about the dispersal of series of return which is not normal obtained from graphic analysis was correct. The persistence of shock is less than 1.

In the residual analysis- table 2, Q-Statistics are applied on standardized residual and standardized squared residuals. As the mean of residual is zero, its square mimics variance. The null of Q-Statistics is that the series is has autocorrelation which is rejected because the p-value is greater than 10% and conclusion is that the standardized residual and standardized squared residuals independent and identically distributed (IID). LM-ARCH test calibrates the result of Q-Statistics on squared standardized residuals.

Graphic Analysis gives an uncertain idea related to the data generating process. We plotted the series at level to check the trendy nature of series at level. Then further we plotted the series of returns for examining the phenomenon of volatility clusters and mean reversion behavior. The existence of volatility clusters gives tentative idea about ARCH (Autoregressive Conditional Heteroskedastic) effect. Density plots of return series have been used in order to check for heavy tails and leptokurtosis. Further we plot Partial Autocorrelation Function and

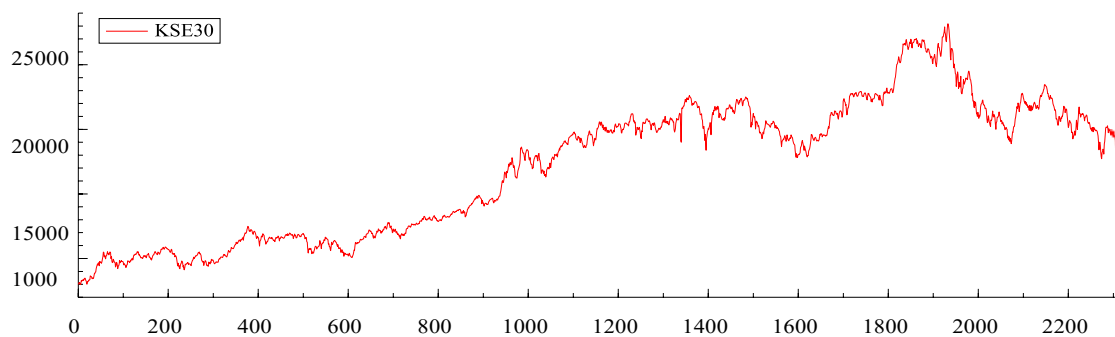
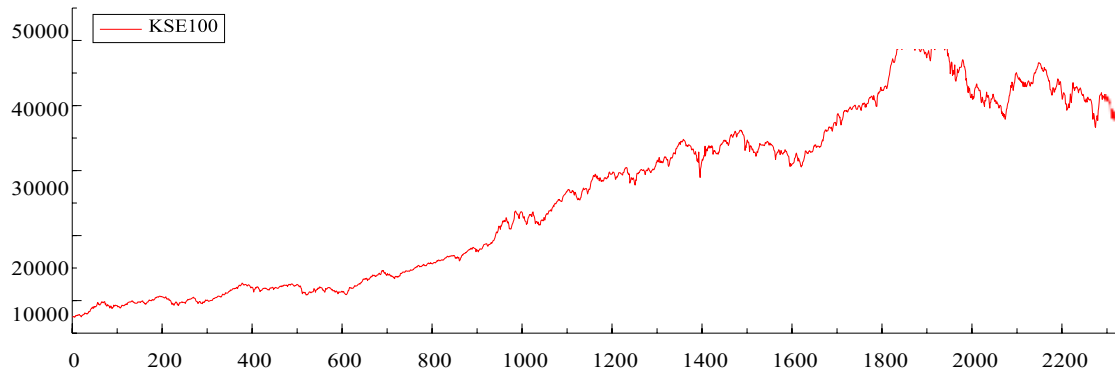


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Autocorrelation Function to have an idea about the process of ARMA (Autoregressive & Moving Average) structure related to the return series.

Figure 1: Series at Level



In Figure 1, one can observe that both the series have trend. Series with trend doesn't have constant mean and variance overtime. Such series cannot be used for forecasting.

In figure 2 below, the return series of Karachi Stock Exchange - 100 index and Karachi Stock Exchange - 30 index is constructed by equation (1). This mean and unconditional variance of



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this series is constant. But one can observe that there are clusters of high and low volatility. This represents the conditional variance and is not constant overtime. This phenomenon is named as Autoregressive Conditional Heteroskedastic (ARCH) effect. It is this phenomenon that motivates our study to use GARCH type model.

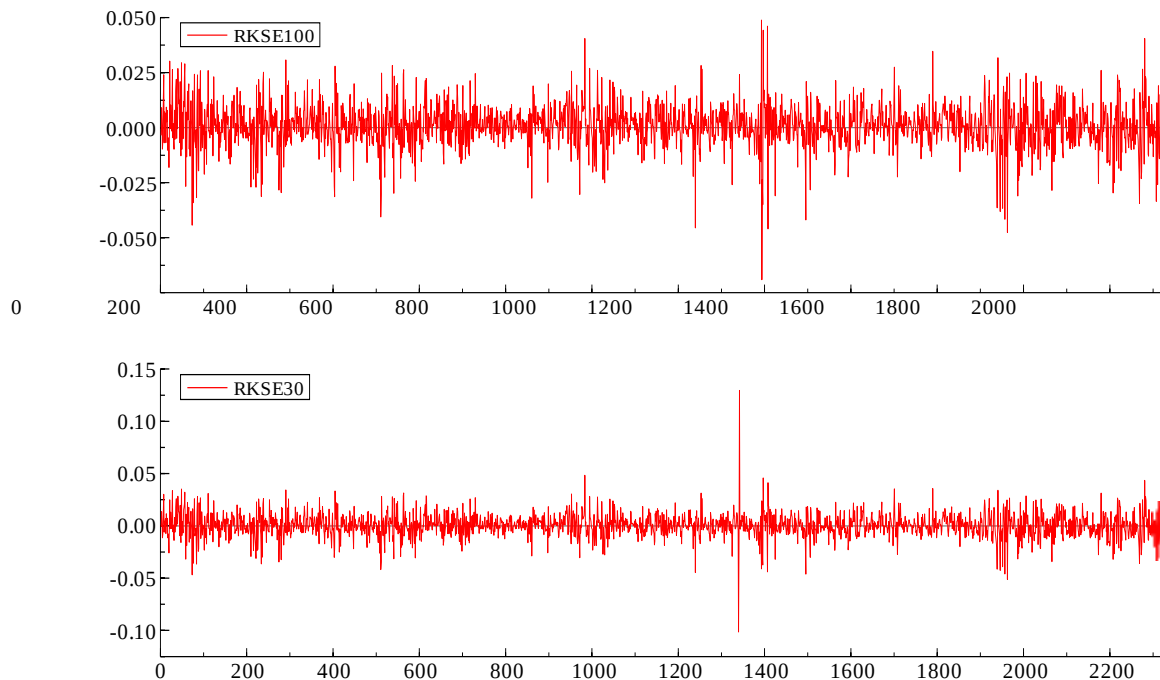
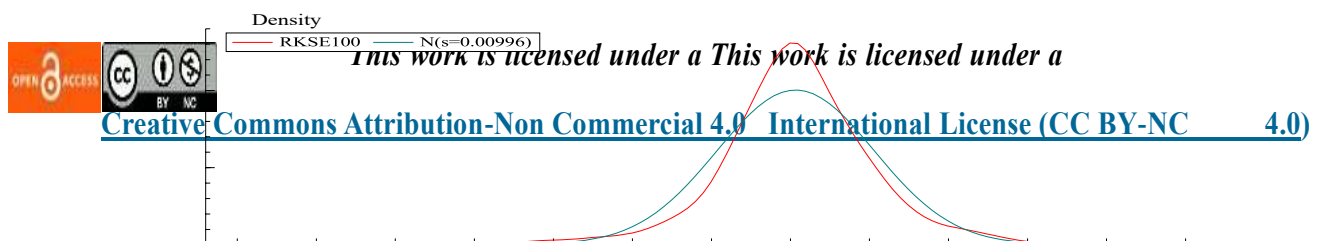


Figure 2: Return Series

Figure 3 below, it provides density plot of the return series of Karachi Stock Exchange - 100 index and Karachi Stock Exchange - 30 index along with the normal distribution reference represented by green line. The highest in the return series is greater than the normal reference along with heavy tails. This gives a uncertain idea that the return series of Karachi Stock Exchange - 100 and Karachi Stock Exchange - 30 index doesn't have a normal distribution. It most closely relates to the student t distribution.



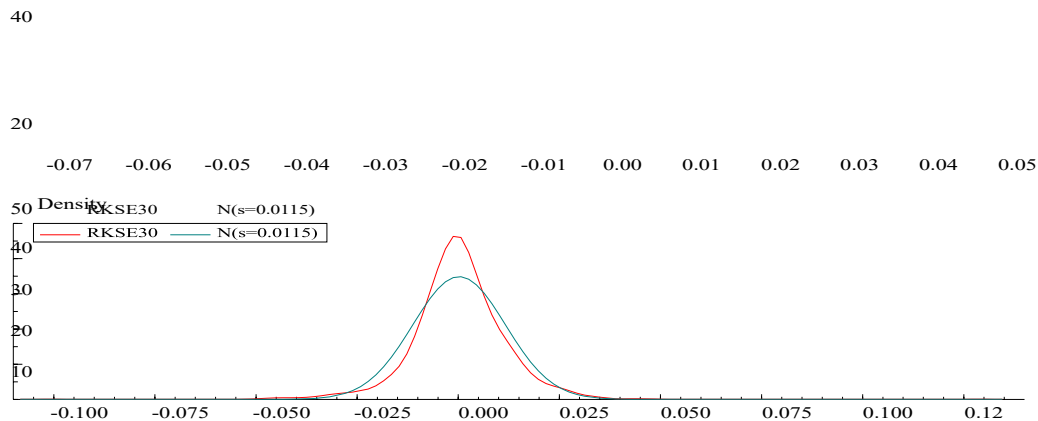
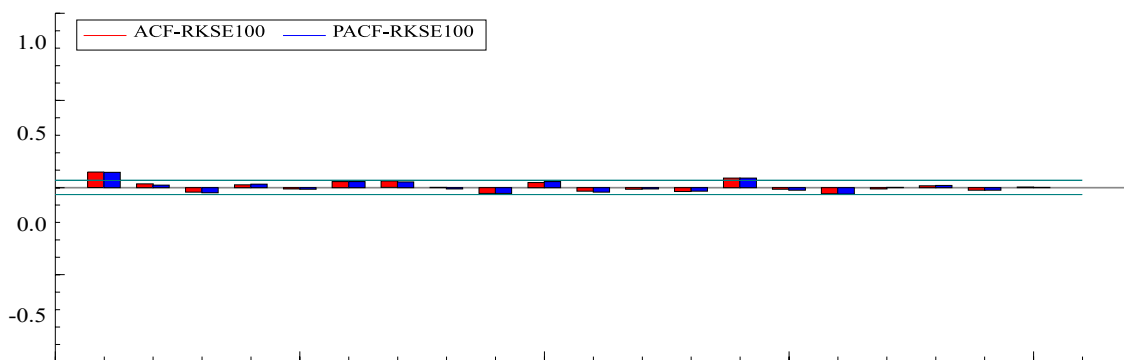


Figure 3: Density Plot of Returns

The figure 4 provides the PACF and ACF for series of return sequence on Karachi Stock Exchange Index - 100 index and Karachi Stock Exchange - 30 index of Pakistan Stock Exchange (PSX). The margins represent the 95% confidence interval and if the spike of PACF represented in blue color or ACF represented in red color is out of the margin of 95% confidence interval then this will represent the number of lags to be introduced in the conditional mean equation of GARCH. The PACF and ACF plot give general idea of ARMA (1, 1) structure. It is not necessary to have the model with exact ARMA structure as identified by PACF and ACF plot. Little bit of deviation is possible when doing empirical analysis.



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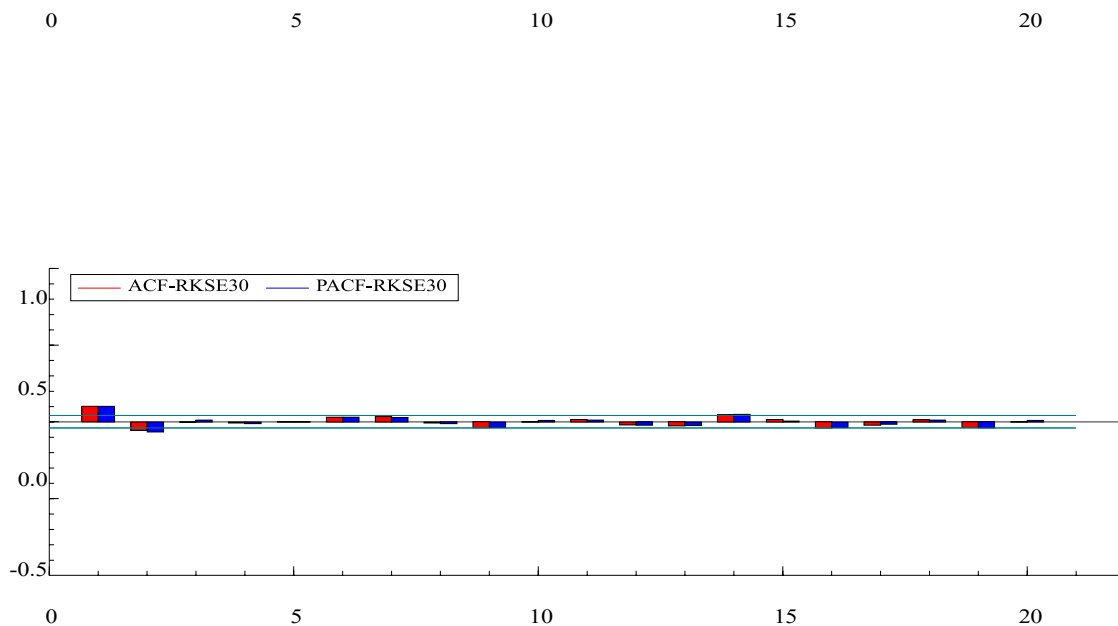


Figure 4: PACF and ACF plots for identifying ARMA (m, n) Structure

5. Conclusion and Future Research Directions

As per our testing and analysis, we conclude that there is return spillover among Karachi Stock Exchange Index - 30 and Karachi Stock Exchange Index - 100, whereas volatility spillover is non-existent. Karachi Stock Exchange Index - 30 derives the return spillover towards Karachi Stock Exchange Index - 100. For better understanding of what has been proved is, consider the top 30 companies that are constituents of Karachi Stock Exchange Index - 30 at Pakistan Stock Exchange on the basis of Free Float market capitalization, in contrast Karachi Stock Exchange Index - 100 constitutes an identical manner as of Karachi Stock Exchange - 30 and includes top 30 companies of Karachi Stock Exchange Index - 30. These 30 companies have more than 50% of market capitalization in Pakistan Stock Exchange, which leads to the case when movement occurs in Karachi Stock Exchange Index - 30 (up or down), Karachi Stock Exchange Index - 100 responds to this movement of Karachi Stock Exchange Index - 30 in similar way. This concept has been named as volatility spillover. For our discussion of study, we have chosen not

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to go into the details of what type of volatility spillover this is rather we were more inclined to study investors sentiment (individually, Portfolio Management Firms and Mutual Funds Management Firms) as they have set the benchmark of Karachi Stock Exchange Index – 100 to take decisions for their investment. Investors are risk averse and in Pakistan Stock Exchange (PSX) due to the majority of small investors and minority of major investors, the information towards majority investors causes irregular decisions. Also, lot of investors in Pakistan Stock Exchange (PSX) rely on the performance of Karachi Stock Exchange Index – 100 because of which investor's insight of Karachi Stock Exchange Index – 100 improvement or decline would be assessed as bases for decision making but our study shows that this information (improvement or declined) is also caused by Karachi Stock Exchange Index - 30 fluctuations. The rationale of this phenomenon signifies that only top 30 companies may face certain fluctuations but overall market remains consistent with its performance. Karachi Stock Exchange Index - 30 comprises of oil and gas, Insurance and Banking sector companies, which derive most of the market. Investors having investment in other than these top 30 companies may earn profit even when Karachi Stock Exchange Index – 100 declines and may face losses when Karachi Stock Exchange Index – 100 improves as the proportionate change in Karachi Stock Exchange Index – 30, is significantly due to the top 30 weightiest companies that also constitute Karachi Stock Exchange Index - 30. This high return volatility presence in Pakistan Stock Exchange (PSX) indicates higher financial risk which can lead to adverse impact on investor's asset and wealth. Investors, Marketers and regulators should contemplate this issue of high volatility spillover. On the other hand, following Karachi Stock Exchange Index – 30 can save investor from the bad investment in a sense that if the improvement of Karachi Stock Exchange Index – 100 has come from 5 companies performance included in Karachi Stock Exchange Index – 30 and investor is opting to invest in the companies that are not the part of Karachi Stock Exchange Index - 30. The reason is return volatility spillover that ignites from the roots of the indices, one having adjustment of dividends and other having market



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capitalization. Investors are caution to take the good study of the both indices before reaching any investment decision and carefully study the impact on one another of the indices.

This study though has been concluded, is not in absolute, and have limitations associated to it. One of such is the time duration that poses constraint to study other factors associated with the volatility spillover such as interest rates, political influence in Pakistan Stock Exchange, Bulls run, and of different sectors considered in formulation of Indices. Hence, it provides further scope to the study of factors other than in-between indices volatility spillover based upon formulation of indices in terms of companies considered. This will further enhance the investor's confidence in investments made ultimately bringing positive returns to the stakeholders and will make market more mature and stable, ultimately bringing prosperity to Pakistan.

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