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Impact of share buyback on price volatility in India: A study of select companies

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Abstract
This study investigates the relationship between price volatility in the Indian stock market and announcements of open market repurchases. A random sample of two businesses (TCS and Wipro) was chosen from among all companies that announced open market repurchases between January and December 2017 in order to evaluate the stock price responses to these public announcements. The results of the repurchase announcement analysis of both sample businesses are negative, and the analysis is carried out using the GARCH model, which is based on the diagnostic properties of time series data. Although price volatility seems to have slightly decreased, the dummy coefficient is regarded as statistically negligible for TCS and significant for Wipro, suggesting that price volatility has an impact on claimed outcomes. This is explained by the fact that open market share repurchases were not accepted by investors as cash payments, and yearly and interim dividend payments were the favoured methods of dividend payment in India for a long time. The investor community's attitudes and dynamics appear to be shifting in India very recently, and the widely held belief that share buybacks are acceptable in the form of cash transfers seems divisive.

Keywords: Causality, GARCH, Open market offer for share repurchase

Introduction
A contentious idea that is frequently invoked to support the start of share repurchase initiatives is the signalling theory. This theory is based on two academic dimensions: the first one implies that management is communicating expectations of future earnings growth through buyback announcements, and the second one highlights the market's inefficiency because current prices do not reflect all available information, which can lead to a price increase without a corresponding increase in earnings. Although the Signalling Theory has been the subject of many research, the findings differ from one nation to another because of differences in regulatory frameworks, investor protection and segmentation, program size, market efficiency, information asymmetry, and repurchase strategies.

Many studies have been conducted on the short-term effects of buyback programs on the stock market, and the topic of repurchase programs has received a lot of attention lately. Buyback plans have been proposed as a way for managers to increase the share price by disclosing private information to shareholders. The pricing of assets can be positively impacted by repurchase plans, according to investors and academics. Many studies on the impact of share repurchase announcements on share price have been carried out by enthusiastic scholars in different nations. Depending on how the repurchase is disclosed, the impact of the news varies in size. When a company's stock price is out of proportion to its real value, it is one of the most effective reasons to buy back shares. The strategic benefits of buying back are evident if this is the case.

Empirical research in the United States has shown that signaling is the most widely accepted explanation for open market share buybacks. The notification effect of buybacks for four distinct repurchase strategies fixed price tender offers, open market repurchases, Dutch auction offers, and private repurchases was investigated by Peyer and Vermaelen (2004). It was discovered that stock prices typically increase in response to buyback announcements, irrespective of the repurchase technique.

Cudd M, Duggal R & Sarkar S (1996) [3] use event technique to investigate the connection between management's buyback motivations and shareholder wealth impacts.

Instead of using the public announcement strategy employed in earlier research, the repurchase motives are obtained from a questionnaire survey. The results of the study show that event premiums and the control incentive for repurchase are positively correlated. In line with earlier research, there is also some evidence in favour of the signalling hypothesis. The effects on shareholder wealth are found to be unrelated to any of the other repurchase motivations, including reissuance, stock undervaluation, lack of investment opportunities, and leverage.

Dixon R, Palmer G, Stradling B, Woodhead A, (2008) [4] found that achieving an optimal capital structure is a major reason for share repurchases in the UK and that the need to cancel shares is essential to buy-back choices in the UK.

Numerous research has examined the abnormal returns that security-holders of companies that repurchase their own shares realize. These studies include those by Woods and Brigham (1966) [20], Elton & Gruber (1968) [5], Stewart (1976) [16], Masulis (1980) [12], and Vermaelen (1981 and 1984) [17, 18]. Most of these studies come to the conclusion that buyback companies generally have a positive wealth effect on security holders.

Three different repurchase kinds were evaluated in a 1991 study by Comment and Jarrell to ascertain the relative signalling effect. All repurchase methods provided positive externalities upon announcement, according to the study; however, the fixed price tender offer had the largest positive externality, at about 11%, followed by the Dutch-auction offer at 8% and the open-market at 2%. Furthermore, the study discovered that buybacks' signalling efficacy was correlated with the company's firm-specific performance but not with the overall performance of the market.

After repurchase tender offers were published, Vermaelen (1981) [17] observed average anomalous returns of about 15%. Vermaelen (1984) [18] offers empirical support for the hypothesis that repurchase tender offers are interpreted as positive signals, and that the percentage of insider positions, premium offered, and target fraction influence them. Masulis (1980) [12] concluded that positive announcement period returns support a semi-strong form of market efficiency. A weak form of market immaturity was proposed by Stewart (1976) [16], who looked at the performance of equities after various buybacks across a number of time periods. They found that it takes a number of years for the success of these choices to be statistically significant in the stock market.

Businesses who announce an open market repurchase program at the beginning date exhibit a 2-day anomalous return of roughly 2% in Europe, according to Rasbrant *et al*. (2013). Businesses that announce on-market repurchase programs exhibit a statistically significant extra return of 1.38% over the -2- to +2-day period, according to Rau *et al*. (2002). Other researchers that have examined repurchase announcements have also shown comparable results (Zhang, Oswald and Young, Lamba and Ramsay, Li and McNally, 2004) [13].

This article aims to determine the effectiveness of share repurchases as a business strategy in India as well as the extent of the market's response to the announcement of an open market repurchase in India. It will be useful to know whether managers of Indian companies implement buyback from this point of view, since it has been argued in the literature that in a situation of information asymmetry, the executive's decision regarding the form of cash disbursement is biased towards repurchasing shares. This article's specific goal is to investigate if announcements of share repurchases affect share prices in India.

Data and Methodology

For the present study, TCS and Wipro have been selected at random from among the companies listed and traded on the Mumbai Stock Exchange that opted to repurchase shares through open market offer. Considering the date of public announcement of share repurchase, the daily close share price data of TCS and Wipro from January 1, 2017 to December 31, 2017 have been used. Further, to isolate the exclusive impact of share repurchase, the daily closing prices of the S&P Sensex Index are also used in this study.

Using descriptive statistics like skewness and Kurtosis as well as Jarque-Bera, can give a basic understanding of changes in the behavior of a time series. It also explains about the distributional properties of time series which is not normally distributed and that is well known in the financial world.

The study starts with testing price series for a unit root using Augmented Dickey Fuller (ADF) tests because any analysis requires the presence of a stochastic trend, deterministic trend, or levels that are stationary or non-stationary in a financial time series. The series is stationary at first difference, according to the coefficient of the ADF test for the sample companies with zero probability. Furthermore, it is commonly known that index returns exhibit the heteroscedasticity property. The ARCH family of models must be used to examine volatility since the time series exhibits heteroscedasticity.

The standard GARCH (p, q) model introduced by Bollerslev (1986) suggests that conditional variance of returns is a linear function of lagged conditional variance and past squared error terms. A model with errors that follow the standard GARCH (1, 1) model can be expressed as follows:

$$R_t = c + \varepsilon_t \ \ where,\ \varepsilon_t/\psi_{t-1} \sim N\ (0, h_t) \quad \text{Equation 1}$$

$$and\ h_t = \ \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \alpha_2 h_{t-1} \quad \text{Equation 2}$$

The underlying asset being the sample companies, the term R_t is replaced b^{y} $R_{TCS,t}$ and $R_{Wipro,t}$in the mean equation. Further, the impact of buyback announcement on stock price volatility can be isolated by removing from the time series, any predictability associated with other factors contributing to the volatility. S&P Sensex has been used as the independent variable in mean return equation to isolate market wide factors other than those which are associated with the buyback announcement day. The mean equation to be estimated is as follows:

$$R_{Infosys,t} = \gamma_0 + \gamma_1 R_{Sensex,t} + + \varepsilon_t \quad \text{Equation 3}$$

$$R_{IIFL,t} = \gamma_0 + \gamma_1 R_{Sensex,t} + + \varepsilon_t \quad \text{Equation 4}$$

In the conditional variance equation, a dummy variable is introduced to investigate the relationship between open market repurchase announcement and price volatility. The

dummy takes on a zero value for pre announcement days, and a one value for post announcement days. The conditional variance equation to be estimated is as follows:

$$h_t = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \alpha_2 h_{t-1} + \alpha_3 D_{Repurchase\ Announcement\ day,t}$$

Equation 5

Where, D_t is a dummy variable and α_3 is the coefficient of the dummy variable. If α_3 is statistically significant, it can be said that open market repurchase announcement has had an impact on price volatility of TCS and Wipro. Further, a significant positive value for α_3 would indicate that announcement effect increases the volatility.

Empirical Results

The descriptive statistics pertaining to skewness and kurtosis indicate that the series is not normally distributed. Further, the Jarque-Bera test statistics for share prices of sample companies are 26.2114 & 58.3254 and statistically significant. The ADF test for presence of unit root in Nifty Index series have been compiled in Table 1. The results show that the series are stochastic at level having a t-statistics of -1.4251 & -1.5287 for TCS and Wipro respectively with insignificant probability value. However, the series are deterministic at first difference with a t-statistic of -20.2589 & -18.6351 with a significant probability value.

Further, as a necessary diagnostic, heteroscedasticity test is conducted to explore the heteroscedastic behavior of financial time series data and the outputs are documented in Table 2. The F-statistics are 28.5322 & 29.4264 with a significant p-value indicate the presence of ARCH effect in TCS & Wipro price. The GARCH model is exclusively designed to address the heteroscedastic behavior of financial time series data. It is designed to provide a volatility measure, which can be used in studying volatility.

Table 1: Results of unit root test of price series

Augmented Dickey-Fuller Test Statistics				
Company	**Price at Level**		**Price at First Difference**	
	T-Statistic	**Prob.***	**T-Statistic**	**Prob.***
TCS	-1.4251	0.7244	-20.2589	0
Wipro	-1.5287	0.5146	-18.6351	0

Source: Computed

Table 2: Results of Heteroscedasticity Test

Heteroscedasticity Test: ARCH				
Company				
TCS	F-Statistic	28.5322	Prob.	0
	Obs.*R-Squared	24.1256	Prob.	0
Wipro	F-Statistic	29.4264	Prob.	0
	Obs.*R-Squared	12.5583	Prob.	0

Source: Computed

To isolate the effect of buyback announcements on sample company prices, it is necessary to eliminate the influence of market-wide factors in accordance with the model specification. Therefore, it is necessary to utilize a proxy variable that reflects the market-wide swings brought on by various economic indices, such as the exchange rate, inflation, growth rates, etc. The market-wide information impacts have been captured using the daily data from the S & P Sensex Index as a proxy. The GARCH (1, 1) model has been used to estimate the effect of buyback announcements on sample company prices. The conditional variance equation now includes a dummy variable for repurchases announcements. Tables 3 and 4 give the findings of the estimation for the impact of TCS's and Wipro's repurchase announcements respectively.

Table 3: Outputs of GARCH (1, 1) Model of TCS

Results of GARCH (1, 1) for the period (January 2017 to December 2017)					
Variables	**Description**	**Co-Efficient**	**Standard Error**	**Z-Statistics**	**Prob.**
γ_0	Intercept	0.005541	0.003247	1.33548	0.05661
γ_1	Sensex	-7.63E-07	6.52E-07	-1.325411	0.3114
α_0	Constant	0.000201	5.21E-06	3.566417	0.0021
α_1	ARCH	0.22887	0.04654	3.99512	0.0001
α_2	GARCH	0.76654	0.200145	0.32541	0.688
α_3	Repurchase Dummy	-3.31E-04	2.26E-04	-0.89552	0.4105

Source: Computed

Although there appears to be a slight decrease in price volatility, the TCS buyback announcement dummy coefficient α_3 is negative (-3.31E-04), and the dummy coefficient is statistically insignificant, suggesting that the announcement of open market repurchase decisions has no effect on price volatility. Given that the corporation has a mix of domestic and foreign investors, it can be the result of differing viewpoints held by various investor classes.

Table 4: Outputs of GARCH (1, 1) Model of Wipro

Results of GARCH (1, 1) for the period (January 2017 to December 2017)					
Variables	**Description**	**Co-efficient**	**Standard Error**	**Z-statistics**	**Prob.**
γ 0	Intercept	0.0020015	0.015324	0.15412	0.7852
γ 1	Sensex	-3.51E-07	3.52E-06	-0.33254	0.8657
α 0	Constant	0.001658	0.000524	7.6554	0
α 1	ARCH	0.411523	0.077452	3.52469	0.0001
α 2	GARCH	-0.25541	0.074421	-1.42264	0.1524
α 3	Repurchase Dummy	-0.00058	0.000108	-5.65211	0

Source: Computed

There appears to be a slight decrease in price volatility, as indicated by the statistically significant coefficient of the Wipro buyback announcement dummy α_3, which is negative (-0.00058). This suggests that the announcement of the open market repurchase strategy has an impact on price volatility. However, because the coefficient is so low, the extent appears to be insignificant. Given that the corporation has a mix of domestic and foreign investors, it can be the result of differing viewpoints held by various investor classes.

Conclusion

This study investigates the relationship between price volatility in the Indian stock market and announcements of open market repurchases. A random sample of two businesses (TCS and Wipro) was chosen from among all companies that announced open market repurchases between January and December 2017 in order to evaluate the stock price responses to these public announcements. The results of the repurchase announcement analysis of both sample businesses are negative, and the analysis is carried out using the GARCH model, which is based on the diagnostic properties of time series data.

Although price volatility seems to have slightly decreased, the dummy coefficient is regarded as statistically negligible for TCS and significant for Wipro, suggesting that price volatility has an impact on claimed outcomes. This is explained by the fact that open market share repurchases were not accepted by investors as cash payments, and yearly and interim dividend payments were the favoured methods of dividend payment in India for a long time. The investor community's attitudes and dynamics appear to be shifting in India very recently, and the widely held belief that share buybacks are acceptable in the form of cash transfers seems divisive.

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