New Product Launch and Stock Returns in the Period of Demonetization : Cross Section and Multivariate Time Series Analysis

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Abstract

The period of demonetization witnessed negative stock returns and earnings growth rates across various industries in India. The average weekly returns during this period on benchmark BSE Sensex was -0.42%, translating into an annualized return of -20.34 %. Using the discounted cash flow (DCF) valuation formula, under the imperfect market conditions, new product innovations can create shareholders' value by affecting one of the two variables: (a) future cash flows that are expected to be produced by the business ; and (b) capital providers' required rate of return at which those cash flows are discounted by the market. A firm can beat competition and increase its future cash flows by indulging in product innovation and launching such new products, which are able to command higher prices in the consumer market. New product innovations can also support the revival of products, which are in declining stages of their product lifecycle, and in turn can reduce uncertainty around a firm's cash flows. Reduction in cash flow uncertainty results in lower required rate of returns by capital providers. Consequently, new product launches can create shareholders' value, which can be captured by stock returns. The present paper used cross section data for listed Indian firms to study investors' response to new product launches in the period of demonetization, that is, October - December 2016. To establish a long-term effect of new product launches on stock returns, a multivariate time series analysis was also conducted for a single firm Maruti Suzuki for 26 quarters ending December 2016. The results suggested that a new product launch has a significant positive impact on quarterly EPS growth rate, and stock returns in the long run as well as in the short run. Also, in the crisis period of demonetization, where all the firms across various industries registered negative growth in EPS and hugely negative stock returns, new product launch worked as a savior for the firm.

Keywords : **demonetization, new product launch, stock returns, time series analysis**

JEL Classification : F3, F6, G1

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Modigliani and Miller (1958) argued that under the assumption of perfectly competitive capital markets with no transaction costs or taxes, capital structure and payout policy do not matter, and firms can create value only by undertaking positive net present value projects. Although, the assumptions of no transaction costs or taxes are highly unrealistic in the real world, still undertaking positive net present value projects like new product innovations are the most important contributors to return on equity investments. Due to high risk of failure, generally, new product development projects are funded through equity capital. Therefore, it is expected to improve the return on equity for investors. Equity investors are motivated by cash flow expectations and reducing the associated risk with investment. Using the discounted cash flow (DCF) valuation formula, under the imperfect market conditions, new product innovations can create shareholders' value by affecting one of the two variables: (a) the future cash flows that are expected to be produced by the business; and (b) capital providers' required rate of returns at which those cash flows are discounted by the market. A firm can

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beat competition and increase its future cash flows by indulging in product innovation and launching new products which are able to command higher prices in the consumer market. New product innovations can also support the revival of products, which are in declining stages of their product life cycle, and in turn can reduce the uncertainty around a firm's cash flows. Reduction in cash flow uncertainty results into lower required rate of returns by capital providers. Consequently, new product launches can create shareholders' value, which can be captured by stock returns. Although the consumer response effects of new product launches are well researched, more research work is needed to capture investors' response to new product innovations.

The present paper uses cross section data for listed Indian firms to study investors' response to new product launches in the period of demonetization, that is, October – December 2016. During the demonetization period, the stock market recorded consistent decline for all the major stocks. The average weekly return during this period on benchmark BSE Sensex was -0.42%, translating to an annualized return of -20.34%. The objective of the present study is to record the stock returns behavior for the firms launching new products during the demonetization period against firms not launching any new product. To establish the long-term effect of new products' launch on stock returns, a multivariate time series analysis was also conducted for a single firm Maruti Suzuki for 26 quarters.

Literature Review

Value maximization theory suggests that managers should make all the decisions to increase the total long term market value of the firm. Total value is the sum of value of all financial claims on the firm including equity, debt, preferred stock, and warrants (Jenson, 2000). Marketing managers are under increasing pressure to measure and communicate the value created by their marketing actions to top management and shareholders (Lehman, 2004). These demands create a need to translate marketing resource allocations and their performance consequences into financial and firm value effects (Rust, Ambler, Carpenter, Kumar, & Srivastava, 2004). Several studies have identified innovation success as a key contributor to both long term firm sales and financial and stock market performance (Pauwels, Silva-Risso, Srinivasan, & Hanssens, 2004). However, new product failure rate is high (ranging from 33% to more than 60%) and has not improved over the past decades (Boulding, Lee, & Staelin, 1994; Sivadas & Dwyer, 2000). Product innovation at firm level requires substantial commitment of long term financial resources. The high costs and risks involved with new products are the main culprit for the decline in both new-to-the-world (- 44%) and new-to-the-company (- 30%) innovations between 1990 and 2004 (Cooper, 2011). Developing new products faster and moving them into production can accelerate cash flows from product innovations (Srivastava, Shervani, & Fahey, 1998).

Larger companies have been criticized for delaying the renewal and upgrade of their product offerings in the face of changing consumer preferences (Ghemawat, 1991). New product launch can be classified in two broad categories, namely, new-to-the-company products, and new-to-the-market products. While new product introductions benefit stock returns on average, new to the market products have a greater impact (Chaney, Devinney, & Winer, 1991). There are mixed evidences in relation to stock market reactions to new products. Boeing's stock price surged 7% when it scrapped development plans for 747X in January 1997, and it declined 1.7% when the company revived the idea two years later at a cost of $4 billion to compete with Airbus 380 (Dresdner Kleinwort Benson Research 2000 ; The Wall Street Journal 1997). Pauwels et al. (2004) investigated short term and long term impact of marketing actions on financial metrics including top line, bottom line, and stock market performance. The authors applied multivariate time series models to the automobile industry, in which new product introductions and promotional incentives were considered important performance drivers. The authors found that new product innovations increase long term financial performance and firm value but promotions do not, and investor reaction to new product introduction grows over time, indicating that useful information unfolds in the first two months after new product launch. Srinivasan, Pauwels, Silva-Risso, and

Hanssens (2009) studied how customer value creation (through product innovation) and customer value communication (through marketing investments) affect stock returns for automobile industry in the U.S. The authors found that adding marketing actions to the established finance benchmark model greatly improves the explained variance in stock returns. In particular, investors react favorably to companies that launch pioneering innovations that have higher perceived quality, are backed by substantial advertising support, and are in large and growing categories. Their results highlighted the stock market benefits of pioneering innovations.

Although the consumer response effects of new product launch are well researched, more research work is needed to capture investors' response to new product innovations. Moreover, studies related to new product launch and stock returns in context of emerging markets in general and India in particular are nearly non-existent. However, several studies are available which capture stock price behavior with respect to various financial variables such as sales, profitability, EPS, liquidity, and capital structure; and various macroeconomic parameters such as interest rates, inflation rate, exchange rates, and gross domestic savings.

Sharma, Mahendru, and Singh (2015) investigated the effects of sales, net profit, and earnings per share on the stock behavior of NSE-listed companies. Their study was based on quarterly data of sales, net profit, and EPS from 2001 to 2010. Authors found no visible effect of sales, earnings per share, and net profit on the future stock prices. Pal and Mittal (2011) found that co-integration between macroeconomic variables and Indian stock indices exists, which is indicative of a long-run relationship. Their results confirmed a significant impact of inflation rate on both the BSE Sensex and the S&P CNX Nifty. Interest rates on the other hand, had a significant impact on S&P CNX Nifty only. However, in case of foreign exchange rate, significant impact was seen only on BSE Sensex. The changing GDS was observed as insignificantly associated with both the BSE Sensex and the S&P CNX Nifty. Das and Megaravalli (2017) inspected the relationship between the selected macroeconomic variables namely, exchange rate, foreign institutional investment, call money rate, and consumer price index (CPI), and the Indian stock market by taking quarterly observations for ten years. Their study found a positive correlation between macroeconomic variables and stock market indices. It was also observed that the stock indices' returns were not a leading indicator of macro- economic variables.

The present study attempted to incorporate new product launch as one of the qualitative variable along with other financial variables in the investigation of stock returns for Indian firms. The present paper used both cross section data for multiple firms for a selected time period, and time series data for single firm for a longer time period to assess the impact of new product launch on stock returns. The quarter of demonetization in India (October 2016 - December 2016) was taken for the cross section study. For time series analysis, a single firm studied was Maruti Suzuki Indian Limited.

Objectives of the Study

(1) To study the impact of demonetization in India during October-December 2016 on various firms across various industries in terms of stock returns, quarterly EPS growth rate, and annual earnings growth rate.

(2) To examine the differences in stock returns and quarterly EPS growth rate for firms that have launched a new product and for firms that have not launched any new product during the period of demonetization.

(3) Identify the explanatory variables for stock returns during the period of demonetization using cross section data for multiple firms.

(4) Identify the explanatory variables for stock returns in the long run using timer series data for a single firm Maruti Suzuki India Limited (MSIL).

Data and Methodology

Cross section data set comprised of 35 Indian firms listed on Bombay Stock Exchange and National Stock Exchange representing several industries like FMCG, consumer durables, pharmaceuticals, banking, information technology, automobile (two wheeler), automobile (passenger cars), telecommunications, consulting, steel, cement, and petrochemical. Quarterly data for stock price return, earning per share (EPS) growth rate, annual earnings growth rates, and shares outstanding were collected for the year 2016.

Data for new product launch were collected for all the firms during the period of demonetization from the websites of respective companies and some industry associations like society of Indian automobile manufacturers, and other public sources. Multiple regression analysis was conducted using stock price return as dependent variable and quarterly earnings per share growth rate, annual earnings growth rate, and number of shares outstanding as independent variables. To represent new product launch in regression analysis, a dummy variable was used. Dummy variable takes on a value of 1 if the firm has launched a new product in the period, and 0 if no new product is launched in that period. Following three models of multiple regression are used for cross section data :

$$Stock\ Returns = b_0 + b_1\ (Quarterly\ EPS\ Growth\ Rate) + b_2 (Annual\ Earnings\ Growth) + b_3 (Number\ of\ Shares\ Outstanding) \quad \text{----------} (1)$$

$$Stock\ Returns = b_0 + b_1\ (Quarterly\ EPS\ Growth\ Rate) + b_2 (Annual\ Earnings\ Growth) + b_3\ (Number\ of\ Shares\ Outstanding) + b_4 (New\ Product\ Launch) \quad \text{----------} (2)$$

$$Stock\ Returns = b_0 + b_1\ (Quarterly\ EPS\ Growth\ Rate) + b_2\ (Annual\ Earnings\ Growth) + b_3\ (New\ Product\ Launch) \quad \text{----------} (3)$$

For the time series analysis, data for three variables mentioned in Table 1, namely quarterly EPS growth rate, annual earnings growth rate, and new product launch were collected for 26 quarters staring from July-September, 2010 (Q3 of 2010) to October-December, 2016 (Q4 of 2016) for a single firm Maruti Suzuki India Limited (MSIL). Data on new product launch for MSIL were collected from the websites of company and Society of Indian Automobile Manufacturers (SIAM). Similar to the cross section study, a dummy variable was used to represent the new product launch by MSIL. Thus, dummy variable takes on the value of 1 if MSIL launched a new product in a particular quarter, and 0 if MSIL did not launch a new product. Unlike cross section data, number of outstanding shares is not an important variable in multivariate timer series analysis, as for the MSIL this variable has changed just once during the entire period of study. Therefore, in time series multivariate regression analysis, dependent variable, quarterly stock return is explained by three independent variables quarterly EPS growth rate, annual earnings growth rate, and quarterly lunch of new products by MSIL. The

Table 1. Study Variables

Variable	Formula
Stock Price Return	(Adjusted Closing Price/Adjusted Opening Price) -1
Quarterly EPS Growth Rate	(EPS_t / EPS_{t-1}) -1
Annual Earnings Growth Rate	$(Earnings_t / Earnings_{t-1})$ -1
Outstanding Shares	Number of outstanding shares.
New Product Launch	Takes value of 1 if a new product is launched, or 0 if a new product is not launched.

following two models of multivariate time series regression are used :

$$Stock\ Returns = b_0 + b_1\ (Quarterly\ EPS\ Growth\ Rate) + b_2(Annual\ Earnings\ Growth) \quad \text{--- (4)}$$

$$Stock\ Returns = b_0 + b_1\ (Quarterly\ EPS\ Growth\ Rate) + b_2\ (Annual\ Earnings\ Growth) + b_3(New\ Product\ Launch) \quad \text{---------- (5)}$$

Analysis and Results

Table 2 presents descriptive statistics for cross section data. Firms are categorized into two groups, Group A: firms that have not launched a new product, and Group B: firms that have launched a new product during the period of demonetization. There are 27 firms in group A and 7 firms in group B. For group A firms, both quarterly EPS growth rate, and annual earnings growth rate are negative. Mean quarterly stock return for group A firms is -8.92%, with a low standard deviation of 5.39%. It is evident from Table 2 that demonetization has an adverse impact on quarterly EPS growth rate for all the firms under group A. Also for group A firms, both the variables, stock returns, and quarterly EPS growth rate have a negative skewness, depicting greater probability of negative outcomes during the period. Measure of skewness is more negative for the quarterly EPS growth rate in comparison to the stock return. Although for group A firms, annual earnings growth rate is also negative, which shows a negative trend in their earnings beyond the period of demonetization. However, negativity is more severe in the quarterly EPS growth rate.

For the firms under group B, that is, the firms that have launched a new product during the period of study, all the three variables namely stock returns, quarterly EPS growth rate, and annual earnings growth rate are positive with mean values of 3.63%, 88.54%, and 1836.72% respectively. Since it is a relatively small sample with few

Table 2. Descriptive Statistics for Firms with and without New Product Launch in Q4 of December 2016

Group A. Firms without New Product Launch	Stock Return	Quarterly EPS Growth Rate	Annual Earnings Growth Rate
Mean	-8.926%	-30.115%	-13.184%
Median	-9.140%	-21.000%	-8.669%
Mode	-3.000%	-17.544%	-17.907%
Standard Deviation	5.392%	37.445%	88.733%
Sample Variance	0.291%	14.021%	78.736%
Kurtosis	-0.1455	12.1332	6.3240
Skewness	-0.6000	-3.1565	1.2902
Count	27	27	27
Group B. Firms with New Product Launch	**Stock Return**	**Quarterly EPS Growth Rate**	**Annual Earnings Growth Rate**
Mean	3.638%	88.545%	1836.723%
Median	4.109%	17.692%	2.672%
Mode	#N/A	#N/A	#N/A
Standard Deviation	5.466%	169.613%	4880.256%
Sample Variance	0.299%	287.684%	238168.960%
Kurtosis	-0.266740959	4.862161585	6.99982322
Skewness	-0.310563046	2.16830277	2.645707421
Count	7	7	7

Table 3. Industry Wise Average Stock Returns, Quarterly EPS Growth Rate, and Annual Earnings Growth Rate

Industry	Stock Return	Quarterly EPS Growth Rate	Annual Earnings Growth Rate
Banking	-7.038%	-1.688%	40.262%
Consumer durables	-6.453%	-19.272%	-101.953%
Automotive (two wheeler)	-11.301%	-15.064%	19.028%
Pharma	-8.857%	-46.565%	-34.307%
IT	-2.904%	-15.173%	-23.221%
FMCG	-6.112%	-13.395%	0.336%
Heavy Engineering	-11.000%	-14.000%	-109.000%
Automobile (Passenger Cars)	-6.025%	-27.249%	47.464%
Cements	-17.000%	-43.000%	-53.000%
Petrochemicals	-1.604%	-3.782%	9.951%
Steel	-10.433%	-46.067%	64.061%
Telecommunications	3.916%	183.398%	6413.858%

Table 4. Results of Multiple Regression Analysis for Cross Section Data

Explanatory Variables	Model I Coefficient *f* statistic/*t* statistic *p* - value	Model II Coefficient *f* statistic/*t* statistic *p* - value	Model III Coefficient *f* statistic/*t* statistic *p* - value
Adjusted R^2	0.3574	0.5255	0.5384
	7.1188	10.1372	13.8329
	0.0009**	0.0000**	0.0000**
Quarterly EPS Growth Rate	0.0706	0.03227	0.0324
	3.1584	1.4489	1.4766
	0.0036**	0.0158*	0.0150*
Annual Earnings Growth Rate	-0.0011	-0.0003	-0.0003
	-0.1201	-0.3912	-0.4477
	0.2391	0.6984	0.6575
Number of Shares Outstanding	0.0000	0.0000	
	1.1175	0.4263	
	0.2726	0.6730	
New Product Launch (Dummy Variable)		0.0909	0.0937
		3.4098	3.6748
		0.0019**	0.0009**

*Significant at 5%, ** Significant at 1%.

extremities, it better to rely on median values instead of mean values of these variables. Median values for stock return, quarterly EPS growth rate, and annual earnings growth rate stand at 4.10%, 17.69%, and 2.67% respectively. It is clear from the median values for group B firms that despite severe negative impact of demonetization on a large section of the market, firms that have launched a new product in that period have positive quarterly EPS growth rate as well as stock return. Also, skewness, however negative for stock returns, is positive for quarterly EPS growth rate. Thus, new product launch serves as a savior for firms in a crisis period.

The Table 3 presents the industry wise data for all the firms for the period of demonetization. Data set includes

both category of firms, with and without new product launch. As it is evident from Table 3, all the industries (except Telecommunications) have negative stock returns, and quarterly EPS growth rate, despite many industries showing a healthy positive annual earnings growth rate. This pattern confirms a severe impact of demonetization on all the industries across the board.

To further confirm the role of quarterly EPS growth rate, annual earnings growth rate, number of outstanding shares, and new product launch, a multiple regression analysis was conducted on the cross section data set. Two independent variables namely quarterly EPS growth rate, and new product launch during the demonetization period are taken to confirm the impact of demonetization on stock returns, while the other two variables namely, annual earnings growth rate, and number of shares outstanding do not confine to the period of demonetization. Results of the regression analysis are provided in Table 4. Three models of regression are run on the cross section data all using stock returns as dependent variable but varying independent variables. Model I is constructed using independent variables namely quarterly EPS growth rate, annual earnings growth rate, and number of shares outstanding, model II adds one more independent dummy variable to the variables of model I namely, new product launch; and in model III, one of the independent variables namely, number of outstanding shares has been removed due to its zero coefficient, and statistically insignificant value in models I and II.

Results of the regression model I, II, III presented in Table 4 clearly show that quarterly EPS growth rate is statistically, a significant explanatory variable in all the models, and it has a positive slope coefficient in all three models. Contrary to this, slope of annual earnings growth rate is negative, but statistically insignificant. Therefore, it confirms that quarterly EPS growth rate, which is specific to the period of demonetization has significant impact on stock returns, while annual growth rate which has influence beyond demonetization period is statistically insignificant. Another independent variable namely, number of outstanding shares has a slope coefficient of 0, in model I and II, and its value is statistically insignificant. In model II, fourth independent variable namely, new product launch has been added. It is a dummy variable which takes the value of 1 for a firm which has launched a new product in the period of demonetization, and value of 0 for the firm which has not launched any new product. From model I to model II, adjusted R^2 improves substantially from 35.74% to 52.55%, and *F*-statistic improves from 7.11 to 10.13 respectively. Slope coefficient of this new dummy variable is 0.0909 and is statistically significant at 1% level. In model III, where variable of number of outstanding shares has been

Table 5. Results of Multivariate Time Series Regression Analysis for Maruti Suzuki India Limited

Explanatory Variables	Model I Coefficient *f*-statistic/*t*-statistic p-value	Model II Coefficient *f*-statistic/*t*-statistic p-value
Adjusted R^2	0.3104	0.6047
	6.6278	13.7519
	0.0053**	0.0000**
Quarterly EPS Growth Rate	0.1693	0.0867
	3.6346	2.1547
	0.0013**	0.0423*
Annual Earnings Growth Rate	-0.0400	-0.03819
	-0.8348	-1.0511
	0.4124	0.3034
New Product Launch (Dummy Variable)		0.2050
		4.2577
		0.000321**

*Significant at 5%, **Significant at 1%.

removed from the regression analysis, adjusted R^2 improves marginally from 52.55% of model II to 53.84%, and F-statistic improves from 10.13 to 13.83. Improved adjusted R^2 and F-statistic confirm that model III has better explanatory power. A positive slope coefficient, and statistically significant value of new product launch dummy variable in both the models I and II, confirms that new product launch plays the role of savior even in crisis period, both in terms of quarterly EPS growth rate and in terms of stock returns.

To confirm the role of new product launch beyond the period of demonetization, a multivariate time series regression analysis using stock return as dependent variable and quarterly EPS growth rate, annual earnings growth rate, and new product launch as independent variables was conducted for the single firm Maruti Suzuki India Limited (MSIL) for the period of 26 quarters ending with the quarter of demonetization, that is, December 2016. Results of multivariate time series regression analysis are presented in Table 5. Model I has just two independent variables namely, quarterly EPS growth rate, while model II has an additional dummy variable for new product launch by MSIL in specific quarter. Quarterly EPS growth rate has positive slope coefficient with statistically significant value in both the models. Annual earnings growth rate has a negative slope but statistically insignificant value in both models. After adding the dummy variable for new product launch in model II, the adjusted R^2 has improved from 31.04% in model I to 60.47% in model II. Also, F-statistic improved from 6.62 to 13.75.

Dummy variable for new product launch has a positive slope of 0.2, which is statistically significant even at 1% significance level. A statistically significant positive slope of 0.2 shows that new product launch has a very strong influence of stock returns in long period as well, which goes well beyond the catastrophic period of demonetization. Results of the present study are consistent with the findings of Pauwels et al. (2004) and Srinivas et al. (2009). However, it contrasts the findings of Chaney, Devinney, and Winer (1991), who showed that new-to-the-company product launches have average impact on stock returns, while new-to-the-market product launches have great impact on stock returns. The present paper considered only new-to-the-company product announcements for 6the study, and found that is has a significant impact on stock returns.

Conclusion, Suggestions, and Implications

The study examined the impact of new product launch by a firm on its stock returns for large number of firms for a specific period of crises i.e., demonetization in the Indian market. Also, the study confirms the same result for a single firm i.e., Maruti Suzuki India Limited (MSIL) for a larger time period of 26 quarters. Collective results of cross section analysis on multiple firms during the period of demonetization, and multivariate time series analysis for a single firm Maruti Suzuki India Limited for multiple periods beyond the demonetization period suggest that new product launch has significant positive impact on quarterly EPS growth rate, and stock returns in the long run as well as in the short run. Also, collective results of industry wise comparison, comparison between firms launching new product and not launching new products, and cross sectional regression analysis during the period of demonetization suggest that in the crisis period where all the firms across various industries have registered negative growth in EPS, and hugely negative stock returns, new product launch works as a savior for firms.

This study has implications for two set of stakeholders in a firm, namely the investor group, and the firm management, particularly the marketing managers of the firm. From the investor's point of view, the study has identified an important qualitative variable i.e., new product launch, which impacts the stock returns considerably both in good and bad times. It is evident from the results of the cross section study that during the period of demonetization, when quarterly EPS growth rate as well as stock returns are negative for all the industries and for all the firms categorized under group A (firms without a new product launch), group B firms (firms with a new product launch) record a robust quarterly EPS growth rate, and healthy stock returns. Therefore, investors should consider new product launch as an important variable while evaluating stock selection both in good times and in crisis period. For the marketing managers, the study confirms that new product launch is

considered as a positive strategic decision by the capital market. As in the case of MSIL, new product launch has a significant positive slope with the stock returns, while studying long duration relationship. In fact, MSIL has regained substantial market share from the lowest of 38.4% in 2011-12 to over 50% in 2016 -17 riding on the wave of continuous new product launches. Although, new product launch reflects strategic decisions taken in the past, yet managers hold a valuable option of delaying the announcement of a new product, which can serve as a savior in crisis period. Also, in many large listed firms, compensation of managers are linked with the performance of the firm's stock in capital market. Therefore, a new product launch may hold a strong bearing on managerial performance evaluation and compensation management as well.

Limitations of the Study and Scope for Further Research

The study took cross section data for 35 firms, and time series data for only one firm namely, Maruti Suzuki India Limited (MSIL) to study the impact of new product announcement on the firm's stock return using quarterly data. One limitation of the study is the inclusion of only new product announcement by firms, and not the information on product success or product failure. There is scope of further research by considering an additional variable for long term success, or failure of the product. Moreover, there is scope of considering customer value communication decisions such as promotions, advertising, etc. as additional factors explaining variance in stock returns. Researchers can also undertake further studies on the topic for larger number of firms using panel data approach.

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