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# ASYMMETRIC MARKET REACTION TO NEW PRODUCT ANNOUNCEMENTS: AN EXPLORATORY STUDY

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## ABSTRACT

*New product development is an important aspect of a firm's strategy. It has major implications for the performance of the firm. This exploratory study looks at the reaction of the stock market to announcement of new product decisions by the firms- development of new products, launch of new products, delay in the launch of new products and exiting the market by employing a prospect theory approach. We posit that the market will react positively to product announcements and entries and react sharply and negatively to product withdrawals and exits. Empirical results and implications are discussed.*

## INTRODUCTION

Innovation and new product development are important strategic activities for a firm. Given the dynamic changes in the marketplace, innovations have become critical. Academic research on new product development has been interdisciplinary, and this research is in that tradition drawing upon insights from marketing, economics, finance, and strategy. The focus of this study is announcements of new product decisions. This study evaluates reaction of the market to announcement of various types of new product decisions- development of new products, launch of new products, delay in the launch of new products and exiting the market.

This exploratory study sought to answer primarily the following research question: How does the market react to announcement of new product decisions? Secondly, we looked at asymmetry in the market reaction to positive and negative announcements.

Towards this, we build our research model based on Prospect Theory (Kahneman & Tversky, 1979). We postulated that consumers will react sharply and negatively to product withdrawals and exits, and positively to product announcements and entries. We postulated an asymmetry in consumer reaction: negative reaction will be sharper than the positive reaction. Since market is after all an aggregation of the consumers, we postulate the similar directional results for the market.

To test this theory, we conducted an exploratory empirical study. We built a model and examined the market value of the firm after it made announcements regarding new products. The market valuation was measured using event study methodology (Fama, Fisher, Jensen, & Roll, 1969; Brown & Warner, 1980, 1985).

## LITERATURE REVIEW

The financial consequences of new product announcements have been a fertile area of research in the literature. New Product announcements have a positive impact on firm's value (Chaney & Devinney, 1991; Bayus, Erickson, & Jacobson, 2003; Pauwels, Silva-Risso, Srinivasan, & Hanssens, 2004). Further, product withdrawals have a negative impact on share holder's wealth (Davidson III & Worrell, 1992). Product delays lead to a decrease in market value (Hendricks & Singhal, 1997; Ahmed, Gardella, & Nanda, 2002; Sharma & Lacey, 2004).

The theoretical basis for our research model is the Nobel Prize winning prospect theory (Kahneman & Tversky, 1979). This theory is an examination of expected utility theory as a descriptive model of decision making under risk, and development of an alternative model. This theory posits the following. People underestimate outcomes that are merely probable in comparison with outcomes that are obtained with certainty. This tendency, called the certainty effect, contributes to risk aversion in choices involving sure gains and to risk seeking in choices involving sure losses. They generally discard components that are shared by all prospects under consideration. This tendency, called the isolation effect, leads to inconsistent preferences when the same choice is presented in different forms. Value is assigned to gains and losses rather than to final assets. Probabilities are replaced by decision weights. The following terms follow from the theory.

1. Reference level dependence: An individual views consequences (monetary or other) in terms of changes from the *reference level*, which is usually that individual's *status quo*.
2. Gain and loss functions: The gain function is concave (risk-averse) and loss function is convex (risk-seeking.)
3. Loss aversion: The resulting value function is steeper for losses than for gains; losing \$100 produces more pain than gaining \$100 produces pleasure. This loss aversion has been investigated in a number of empirical studies across business disciplines.

There is asymmetric reaction at the individual/ consumer level to price increases and price decreases (Kalyanaram & Little, 1994). Consumers react more sharply to price increases (losses) than price decreases (gains). This is consistent with prospect theory. Hence, we frequently observe nibble price increases and deep discount prices. Asymmetry in market valuation was observed in the context of pharmaceutical industry (Sharma & Lacey, 2004).

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Prospect theory has also been applied in the context of asset prices (Barberis, Huang, & Santos, 2001). The study investigates asset prices in an economy where investors derive direct utility not only from consumption but also from fluctuations in the value of their financial wealth. The theoretical model is based on prospect theory principles, and on experimental evidence on how prior outcomes affect risky choice. The findings are:

1. Investors are loss averse over these fluctuations, and the degree of loss aversion depends on their prior investment performance.
2. The framework also helps in explaining the high mean, excess volatility, and predictability of stock returns, as well as their low correlation with consumption growth.

### **RESEARCH QUESTION**

Can the individual level reactions/effects be aggregated? We think that it this is an empirical (and experimental) question. Thus, the key research question is

How does the market react to new product announcements?

We investigate the market reaction for four classes of announcements:

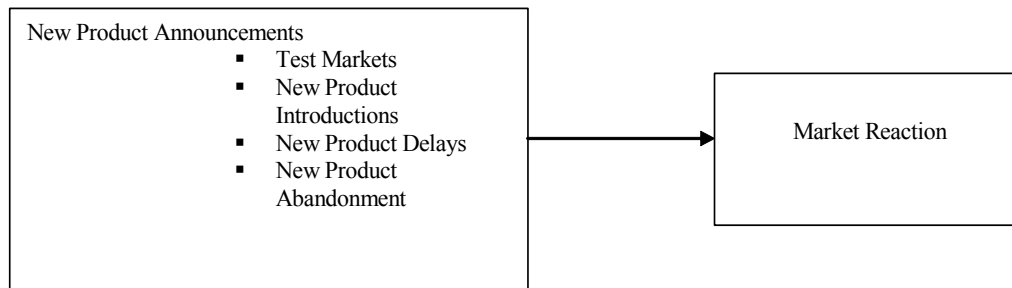
#### **Test market/initial entry**

1. National Launch
2. Delays
3. Exits

Based on prior research (Chaney & Devinney, 1991; Davidson III & Worrell, 1992; Hendricks & Singhal, 1997; Ahmed, Gardella, & Nanda, 2002) and theoretical framework (Kahneman & Tversky, 1979; Sharma & Lacey, 2004), the study posits the following results:

1. Market reacts negatively to delays and/or abandonment of new products
2. Market reacts positively to new product launch (test market and national launch) announcements
3. The negative reaction by the market is sharper than the positive reaction

These are visually summarized in Figure I.

**Figure 1: Research Model****DATA COLLECTION**

The data for the calibration and estimation of the model came from multiple archival sources. The announcements relating to new product development were obtained from the Lexis-Nexis database. The data relating to the stock prices came from the CRSP (Center for Research in Security Prices) database maintained by the University of Chicago. The study employed WRDS (Wharton Research Data Services) as the common interface to access CRSP database.

**EVENT STUDY METHODOLOGY**

Event Study Methodology (Fama, Fisher, Jensen, & Roll, 1969) was employed to calculate the market value of the firm following the announcement of new products decisions. Figure II provides a flowchart that summarizes the sequence of steps involved in the event study. Each of the steps is briefly explained below.

**Identification of Event of Interest**

The event of interest in this study is defined as announcements related to new products. The announcements were categorized into one of two categories – delays and/or abandonment of new products and product launches. The first category included delays in launching new products, cutbacks in investments, and product abandonment announcements. In order to avoid the confounding of product abandonment due to product life cycle issues, only those abandonment decisions that would take place within a short time (i.e. less than a year) of being launched were included in the study. The second category included announcements of new products during tradeshows and the test marketing of new products, and press releases and stories relating to the next generation of technology products and new product related investments, which also included launch of new products and/or extension of a newly launched product into new markets. These

announcements were collected using the Lexis/Nexis database. The announcements are summarized in Table I.

### **Definition of Event Window:**

This is an important step as a precise definition of the event window is essential in order to make the event study methodology meaningful (Brown & Warner, 1985; Fornell, Mithas, Morgeson, & Krishnan, 2006). Shorter windows yield more precise estimation as they minimize the possibility of confounding events. The choice of event windows depends upon the phenomenon under investigation. The recommended window sizes are small as information regarding new products would be absorbed very fast by the market (Chaney & Devinney, 1991; McWilliams & Siegel, 1997). This study employed a three-day event window (-1 to + 1) consistent with prior studies in the literature (Lane & Jacobson, 1995; Hendricks & Singhal, 1997; Gilley, Worrell, Davidson III, & El-Jelly, 2000). The study also employed five-day and seven-day windows ((Chaney & Devinney, 1991; Fornell, Mithas, Sabherwal & Sabherwal, 2005; Morgeson, & Krishnan, 2006) to test the sensitivity of the results. The longer event windows helped in assessing the robustness of results as they would help in accounting for leakage of information to the market.

<b>TABLE 1: TYPES OF ANNOUNCEMENTS</b>	
	Category I Announcements of:
1.	Delays
2.	Cutting back on investments
3.	Product abandonment
4.	Withdrawal from the market
	Category II Announcements of:
1.	New product investments
2.	Test Market
3.	Product launches

### **Selection of Firms**

All the announcements regarding new products would be examined. In order to prevent confounding, one needs to employ controls (MacKinlay, 1997). Thus the firm related announcements were examined in order to remove all announcements that were not related to new products. These announcements were obtained from the Company website. The window chosen was five days before and after the event (Fornell, Mithas, Morgeson, & Krishnan, 2006). Any new product related announcement that had a confounding event in this ten day window was eliminated from the sample.

### Prediction of Normal Returns

In order to predict the normal returns, the standard normal model was employed. The calculation of the normal model is explained in the following steps:

The market rate of return was estimated by employing the market model (Brown and Warner 1985). The market model is a linear relationship between the return on a stock and the return on the market portfolio over a given period of time. The market model is of the form:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \text{ where}$$

$R_{it}$  == Rate of Return on the common stock of the  $i$ th firm on day  $t$

$\alpha_i$  == Intercept

$\beta_i$  == Slope Parameters

$\epsilon_{it}$  == Disturbance Term

The estimation period was a period of 255 days with a noise period of 10 days prior to the event.

The market rate of return  $R_{it}$  for firm  $i$  for day  $t$  was calculated as:

$$R_{it} = \alpha_t + \beta_i R_{mt} + \epsilon_{it}$$

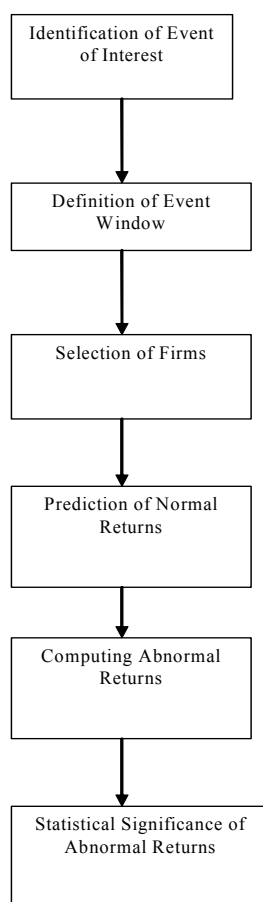
### Computing Abnormal Returns

The abnormal return for the common stock of the firm  $I$  for day  $t$  is calculated as

$$AR_{it} = R_{it} - (\alpha_t + \beta_i R_{mt}).$$

The Cumulative Abnormal Returns over a sample of  $N$  firms are computed as follows:

$$CART_{T1, T2} = \sum_{t=T1, T2} AR_{it}$$

**FIGURE II: FLOWCHART OF STEPS INVOLVED IN AN EVENT STUDY**

Source:(Brown & Warner, 1980, 1985; Fama, Fisher, Jensen, & Roll, 1969; MacKinlay, 1997; McWilliams & Siegel, 1997)

### **Statistical Significance of Abnormal Returns**

T-statistics were used to test the significance of the cumulative abnormal returns. Following (Sabherwal and Sabherwal 2005), the variance of the cumulative abnormal returns was calculated as:

Mean of CAR using the formula:  $\text{Mean CAR} = 1/N (t = T1, T2 \sum \text{ARit})$

### **Variance of CAR using the formula**

$$\text{Variance (CART1, T2)} == 1/N2 (t = T1, T2 \Sigma \sigma_{et}^2)$$

where N is the sample size and  $\sigma_{et}$  is the variance of the Mean CAR.

A one tailed t-test was used to test for the significance of the cumulative abnormal returns,

$$t = \text{Mean of CART1, T2} / \text{Square Root (Variance (CART1, T2))}$$

## **RESULTS**

The results are summarized in Table II. In the case of the new product delays and exit condition, the returns for all three event windows were negative and statistically significant. Thus, there is strong support for Hypothesis 1. Next, this study analyzed the market reactions for the new product launch and test market condition. A summary of market reactions to both the new product launch announcements and test market announcements for one-day (Day Zero), three-day and five-day windows is provided. The cumulative abnormal returns in a one-day window were positive and statistically significant. However, the returns in a three-day window and a five-day window were not positive. This leads to a possibility that all new product launch announcements are not viewed positively. Thus, there is moderate support for Hypotheses 2. Further, when the study looked at the results of the market reaction to product launch announcements and test market announcements versus market reaction to new product delays and exit condition, it finds that the impact of new product delays and exits is more pronounced with a greater absolute magnitude of CAR as well as having a longer impact (it is pronounced across longer time windows). This lends support to Hypothesis 3.

## **DISCUSSION**

Test market and national launches lead to positive reaction in market return. Announcement of delays and exits lead to negative reaction in market return. The negative reaction is much sharper than the positive reaction. The results are similar to other previous studies like Sharma and Lacy (2004). Managers need to be very careful in product planning and announcements. Delays not only impact the firm but also the eco-system-partners and trust with customers and other stakeholders. Test marketing and launches in a limited sense lead to positive reaction in stock valuation. Any initial sequential new-product foray into a market is viewed positively. This suggests that such calculated risk-taking is rewarded. Managers need to be careful in announcement of delays and abandonment. Delays and abandonment have a more pronounced and sustained impact. This may



also be a reason why there are fewer numbers of product delay and product abandonment announcements. This research is an interdisciplinary work as it is at the interface of marketing and finance. It brings in concepts like event-study methodology to study one of the core marketing concepts like new product development.

### LIMITATIONS

1. *Small Sample Size*: A major limitation is the rather small size of the sample, especially in the delay and product abandonment sample. This is owing to the fact that a lot of product delays or abandonment decisions are not explicitly announced. Apart from this, a lot of new product decisions are announced simultaneously in one public announcement or in announcements within a short time interval. Hence, these announcements cannot be used for analysis owing to the methodological considerations of the event-study methodology.
2. *Presence of Outliers*: In spite of all the methodological considerations that were followed in the event-study methodology, there were some outlying observations in the sample. Hence, the results have to be interpreted with caution.
3. *Business-to-Consumer product firms*: The sample included only business-to-consumer product firms. The study needs to include business-to-business type firms in future samples.
4. *Consideration of Product- and Firm-level factors*: Future research would need to incorporate the effect of factors like size of the firm, diversification levels, etc to investigate possible moderating effects.

### CONCLUSIONS

New product development and test market announcements are perceived as good by the market. The firms are rewarded favorably. However, news like product abandonment and product delays are viewed negatively. Hence, firms must exercise caution about decisions on creating new products as the market would penalize them for new product investments that result in delays and exits. Hence, this study indicates that cautious optimism rather than reckless enthusiasm reflects the overall sentiment of the market for new product development and innovation as a whole.

TABLE II SUMMARY OF RESULTS OF EVENT STUDY

Test Markets	CAR	T-statistic	n(N)
<b>Time window</b>			
0	0.001	0.32	37/80
(-1,+1)	0.0068463(37)	0.64	37/80
(-2,+2)	0.0154869(37)	1.31*	37/80
<b>New Product Launch</b>			
<b>Time window</b>			
0	0.0054	1.28*	59/73
(-1,+1)	-7.82	-2.31	59/74
(-2,+2)	-12.3	-2.16	59/75
<b>New Product Delays and Exits</b>			
<b>Time window</b>			
0	-7.9	0.0826***	19/19
(-1,+1)	-13.903	0.0826**	19/19
(-2,+2)	-27.8	0.0826**	19/19

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