THE IMPACT OF PRODUCT PLACEMENT ON FIRMS' REVENUE

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ABSTRACT

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Traditional advertising has been less effective in influencing target markets and therefore various nontraditional advertising approaches have been emerged. One of the progressively growing nontraditional alternatives is product placement which has received incredible attention and interest among marketers. Despite the extensive use of product placement little has been done regarding studying the true value of this marketing technique. Therefore, this thesis aims at addressing the financial worth of product placement and examines: (1) the impact of the number of product placements on the revenue of firms and (2) the effect of box office success of movies on the revue of firms.

The research questions are addressed by adopting a linear regression modeling. The results show that (1) the number of product placement is an important factor in the positive move of revenue and (2) the total box office success of movies featuring the product does not influence the revenue of the firm.

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Introduction

Despite the crucial role of advertising in firms' marketing mix, being one of the most visible areas of marketing activities in terms of effectiveness, and thus presenting an area of particular interest for marketers and researchers, advertising is believed to have been reduced in effectiveness. The underlying reasons for this decline are the followings;

First, consumers' resistance toward ads which reflects in zipping and zapping through the ads and use of commercial avoidance technologies like DVRs. According to the statistics released by MediaMark Research Inc (MRI) in 2007, American households will increasingly and deliberately keep away from TV advertising and thus extensively avoid television advertising exposure to the point that "By 2011, 45 million TV households, or about 40% of all TV households, will avoid nearly all ads within the TV content they watch." (MediaMark Research Inc (MRI), 2007)

Second, commercial clutter which makes it difficult for marketers to reach potential customers in today's saturated advertising environment (Gupta and Lord, 1998)

Finally, marketers' tendency toward nontraditional media (Balasubramanian, Karrh, and Patwardhan, 2006)

Due to the aforementioned reasons, marketers have increasingly turned to nontraditional alternatives for traditional advertising in order to more efficiently and effectively reach their target customers and we therefore witness the continuous growth of non-conventional advertising approaches. As opposed to traditional advertising which mainly encompasses TV, radio, and print, non-traditional advertising contains blogging, online video advertising such as You Tube, mobile advertising, video game advertising, social networking such as Facebook, Innovative outdoor advertising that step beyond the traditional billboard executions and etc. Non- conventional outdoor advertising is the creative use of outdoor media to reach potential consumers and grab their attention through the element of surprise where they expect the least. An interesting example is the creative yet inexpensive use of bus stops as an advertising mean by having the bus shelter filled with the long lasting fragrance of a product or the use of toilets and restrooms as advertising locations. Last but not least in the list of nontraditional advertising is product placement which has gained considerable attention among other non-conventional advertising techniques and provides indirect TV and movie advertisement which does not instigate customers' avoidance common to the traditional advertising. Hence, witnessing the decline in the productivity of traditional advertising, marketers have leaned toward acquiring product placement. According to a survey published by Association of National Advertisers (ANA) and Forrester Research, 62% of marketers believe that traditional TV advertising has become less effective during the past two years and 87% believe that the crucial means to TV advertising in the near future is branded entertainment (ANA and Forrester Research, 2008). In pursuit of influencing consumers' attitude toward brands, product placement as an effective marketing approach has emerged and has been considerably growing over the recent years. "Product placement" or "brand integration" refers to the practice of paid inclusion of a product within media content through audio, visual, or audiovisual modes of presentations to achieve visibility and audience exposure. It can be a subtle and seamless integration of a brand within the movie or a more prominent and visible presentation of a product.

To provide a history of this practice, the growth of product placement over the past several decades towards its peak in today's marketing discipline can be examined. Its rise goes back to 1920's through 1930's with a sporadic and uncertain trend followed by a silent era until the late 1960's and 1970's (Balasubramanian, Karrh, and Patwardhan, 2006). Once again, it grew considerably in 1982 (as opposed to research being fairly young and only a decade old) when sales of Reese's Pieces incredibly (by 65%) improved after the release of "E.T" which successfully featured Reese's Pieces candy (Gupta and Gould, 1997). Firms spend tens of millions of dollars on their product placement to enjoy the unique advantages of this marketing strategy. Moreover, firms' contribution toward the production cost of movies in exchange for their products being integrated into those movies surges every year. In 2007 paid product-placement spending expanded almost 34% to $2.9 billion and was also projected to grow 28% to reach $3.7 billion in 2008(PQ Media, 2008). The drivers of this growth over the years are not only the aforementioned reasons behind the decline in the effectiveness of traditional advertising but also the acknowledged improvements of sales after a product being featured in a movie and the proven benefits of such communication strategy. Of the advantages of this persuasion marketing tactic we can point to the followings: the longer life span of product placement compared to the traditional advertising (Yang and Roskos-Ewoldsen, 2007; d'Astous and Chartier, 2000), combating the problem of zapping and preventing consumers from switching channels during commercials and tuning them out (Avery and Ferraro 2000; d'Astous and Chartier, 2000, Yang and Roskos-Ewoldsen 2007), influencing consumers' attitude toward the placed brand through an implicit celebrity endorsement (in case of brand use by the main character)(Avery and Ferraro, 2000), and finally augmenting movie realism due to the use of consumer products in the scenes as reflections of daily life (Gupta and Gould, 1997)

Despite the extensive growth of product placement and abundant evidence on its success in customers reach and exposure, the research conducted in this field has progressed far less than the relevant practice. Furthermore, even though the marketing scholars have carried out considerable empirical research on the outcomes of traditional advertising and its effect on firms' performance little has been done to assess the true effect of product placement as an alternative to the traditional broadcast advertising on firms' profit and future cash flow (Wiles and Danielova, 2009). Besides the lack of focus on this strategy among extant marketing research in various topics, reviewing the existing literature on product placement reveals two trends. First, within the deficient research in this field a growing stream of research has examined the effect of product placement on brand awareness, attitude, and purchase intent. However, there is little evidence of addressing the crucial question of whether firms' investments in product placement pay off (the economic worth of product placement in movies). Since Firms allocate an extensive and continuously growing portion of their marketing budget to afford placement of their product in movies, firm managers need to gain evident certainty about the effectiveness of brand integration within the movies as a costly marketing tool. Second, in addition to the insufficient attention to the effectiveness of product placement in terms of financial worth, little has been done to address the role of movie success in the value of product placement. In other words, the relationship between success of the movie in terms of box office sales and the success (effectiveness) of product placement in terms of sales of the product featured in that movie has been neglected.

Therefore, this thesis thrives to fill these two knowledge gaps and provide an empirical evidence to initially address the influence of this marketing practice on the revenue of the firms and furthermore support the contribution of movie success (box office) to a firm's success after its product has been integrated within that movie.

The remainder of this study is organized as follows: next section will provide the conceptual foundation developing the main contributions of this study and then the proposed hypotheses will be put forward. We then review the methodology explaining the data collection procedure and provide descriptions of the variables. In the next section we present the analysis and its results followed by a discussion on the findings. Finally, we discuss the managerial implications, limitation of our study, and also the future avenues for further research on this subject.

Conceptual background

Effectiveness measures for product placement

The McCracken's (1989) meaning transfer model has been incorporated in various studies examining the effectiveness of product placement as the mechanism to explain consumers' reaction to brand integration (Wiles and Danielova, 2009). According to this model, the advertiser determines the cultural meaning that the product is meant to carry. Then, the marketer searches for tools to highlight the cultural meanings associated with the product. One of these tools could be the celebrity endorsers who aid marketers in transforming the cultural meaning attached to the product into a visible form. In fact, the celebrity's meaning is transferred to the product with which it is associated in the advertisement or placement. Thereafter, some part of the celebrity's meaning is part of the endorsed product. The product's meaning will then be transferred to the consumer during the purchase and consumption (McCracken, 1989). Similar to what happens in the process of celebrity endorsement, movies have cultural and symbolic meaning that is reflected in the movie atmosphere, actors/actresses, story, featured places, and so forth and can be transferred to the product placed in it and thereafter to the consumer in case of purchase. In fact, consumers try to connect the movie world to their own life which will eventually affect their attitude toward the featured product (Wiles and Danielova 2009). Enhancing consumer's attitude towards the placed brand, also a measure of product placement effectiveness, is the means to achieve marketers' ultimate goal which is enhancing consumers' purchase intention.

Previous studies have generally restricted their focus to a limited number of effectiveness measures (Gupta, Balasubramanian, and Klassen, 2000). The first effectiveness variables that attracted researchers' attention were the memory-based measures such as recognition and recall. Gradually attitudinal effectiveness measures such as attitude toward the placed product were also incorporated in studies examining the effectiveness of brand placement.

d'Astous and Chartier (2000) investigated the product placement effectiveness from this window. They studied the influence of subjective and objective characteristics of product placement on consumer memory (brand recall) and evaluation. They found that product placement enhances brand awareness and customer attitude. Moreover, the results of their study revealed that depending on which objective to choose when designing and implementing this strategy (brand awareness or attitude/ likeability) marketers should go for different sets of specific characteristics for product placement.

Another study done regarding the memory-related effectiveness of brand integration is the one carried out by Gupta and Lord (1998). In their study, they examined the impact of mode of presentation (Audio/Visual/both) and the level of prominence (subtle/prominent) on brand recall. The investigation of brand recall (effectiveness) in their research also involved comparisons between prominent or subtle product placements and advertisements. Another recent research regarding the affection aspect of product placement is Homer's (2009) study that examines the effect of two moderation factors on consumers' attitude towards the product placement in movies; the type of placement (prominent or subtle) and repetition (low or moderate). In fact, a considerable portion of research in the field of product placement has dealt with the impact of the characteristics of this practice on audience reaction in terms of brand memory and attitude.

So far the bulk of research in this area has not significantly stepped beyond inspecting the intermediate consumer outcomes toward analyzing more direct measures of effectiveness that is sales based measures such as purchase intention or the actual sales. Although the research question of which class of measures (memory-based, attitudinal, or sales-based) is the most appropriate tool for gauging the effectiveness of product placement (Karrh, Mckee, and Pardon, 2003) hasn't been answered properly, it is worthwhile mentioning that thus far researchers have strongly favored the first two measures and therefore, more attention should be paid to sales-based measures in product placement research. Karrh et al. (2003) tried to respond to this research question although from the viewpoint of leaders of product placement field. They conducted a survey of the members of ERMA (the Entertainment Resources and Marketing Association) to examine the beliefs of the most knowledgeable practitioners in placement industry. The results of their study showed that the practitioners favored "aided recall" (a memory-based measure) as the most appropriate tool as they did in a survey conducted by Karrh (1995) 8 years ago.

Pointing out to the need for more research on the placement effect on purchase intention, Balasubramanian, Karrh, and Patwardhan (2006) believed in the necessity of having sensitive measures explaining the marketer's claim of sales improvement after product placement. Reviewing the literature on product placement, Balasubramanian, Karrh, and Patwardhan (2006) developed an integrative framework capturing audience response to these messages. This conceptual model consists of four components; execution factors, individual –related factors, message processing depth, and finally message outcomes. The classification of the latter revolves around the Hierarchy of

Effects model (HoE). This model whose development goes back to more than a century ago orders message outcomes into three classes; cognition, affect, and conation. The three broad categories basically reflect awareness, liking, and purchase intention. In contrast with the many studies on cognition and affect outcome classes, in the list of representative studies, few deal with conation category of outcomes.

The only empirical study on the direct effect of product placement on firms' performance is the one conducted by Wiles and Danielova (2009). They answered to the question of whether or not film placement is a worthwhile practice. Therefore, conducting an event study as a means to isolate and explore the unique contribution of placement of a product in some successful movies (the event) to the firms' profit, the authors provided the first empirical evidence of the value of product placement. In fact, increase in firm's stock price has been shown by their study to be associated with the product placement in successful movies. Although the change in a firm's stock price is an adequate indicator of the economic worth of product placement, it would be more appropriate to actually measure the change in revenue and profit of a firm after its product being appeared in a movie. In other words, instead of studying stock price of the firm after product placement based on estimating the expected effect of product placement in the future which is enhanced cash flow, we can directly examine the change in firm's revenue in a few years after the placement.

On the other hand, contrary to common expectation regarding the impact of product placement on the sales of the placed product, the results of Karrh, Mckee, and Pardon's (2003) study findings revealed that surprisingly sales of the placed product after the release of the movie as one of the best means of measuring placement effectiveness was not significant.

This thesis essentially focuses on the revenue of the firms in the year after the release of the movie featuring their brand which is in fact the reflection of the change in sales of the placed brand during that year. The reasons behind such focus are: first, lack of research dealing with sales-based effectiveness measures and particularly firms' revenue and product sales following product placement and second, the significance of sales improvement as a visible evidence of product placement worth and a direct judgment of the legitimacy of the huge expenditure on this marketing strategy. Due to the aforementioned need to directly examine the change in firms' revenue after carrying out this controversial marketing technique, we investigate the impact of product placement on the revenue of the firm during the year following the placement and propose the following hypothesis:

H1: The revenue of a firm is positively related to the number of the movies within which the firm has placed its product.

Box office success of movies

In addition to the assessment of the revenue of product owners after placing their product within movies, an aspect of this practice worth addressing is the impact of movie success on the success of this marketing technique. The most determining element uncovering the success of the movie is in fact the movie's box office. Box office is defined as the total admission receipts of a movie. Therefore, what this variable reflects is not only the level of success of the movie from the film producers' perspective, but also the size of the audience exposed to the integration of a product into that movie. The effect of audience size as one of the film factors on the success of product placement seems readily understood. In fact, the ultimate objective of this brand communication tool is to maximize consumer exposure to a brand which will result in higher brand awareness and recall which consequently leads to enhanced brand recognition at the point of purchase or the brand being included in consumer's consideration set. The larger the audience size, the higher the consumer reach and exposure. The significant result regarding movie's opening in Wiles and Danielova's (2009) study suggests the necessity of a cut off for audience size in order for product placement to be worthwhile. Furthermore, Wiles and Danielova (2006) found that audience size enhances the shareholder's wealth resulting from product placement.

Besides denoting the size of audience or potential customers being reached by a placement integrated within a movie, movie's box office also holds a signaling effect that adds to its significance leading to the success of product placement. The signaling effect associated with movies' box office is twofold which aims first the potential investors and second the potential customers watching the movie. First, according to Erickson and Jacobson (1992), the amount of advertising expenditure indicates the availability of firm's financial resources compared to that of its competitors. What this means to the potential investors is the improved cash flows and market values. Regarding the second aspect of signaling effect of a movie's box office which is in fact linked to our study, we suggest that the presence of a product in a successful and most likely high-ranked movie communicates the value that the product might bring to the customer in case of purchase in two ways. First, association of the product with the drivers of movie success such as star power, director's reputation, sequels, and movie's production budget encourages the movie watcher to consider the placed product as superior to its rivals and to also include it in their consideration set in case of purchase. In other words, since the success drivers in a way act as signs of a "good movie" for a moviegoer, the integrated product within such movie enjoys the association with that movie and the value attached to it. Second, since the cost of placing a product within a movie is determined by the set of factors that are indeed the movie success drivers such as the presence of stars, genre, production budget, etc before the screening , the high box office in fact shows the level of firms' confidence in their product placed in that movie.

Therefore, it would be interesting to link the effectiveness of product placement to the success of the movies in terms of box office. We assume that the effect of a product display within a high profile or successful movie whose box office sales has soared substantially among other on-screen rivals is drastically different from the consequence of the integration of that product within a movie with lower than average box office success. The reason behind this statement is the substantially different amount of recognition that a company will receive by placing their product in a popular movie as opposed to that gained by brand integration within a movie with relatively low box office success. Focusing on the box office success of movies and spending a considerable portion of advertising budget on popular movies to expect taking advantage of the huge success of that movie give rise to the risk involved with this practice. Therefore, for firms to allocate millions of dollars to product placement and invest in the success of movies as an assurance of the success of their placement there should be some firm evidence that the box office sales of those movies highly improves their revenue. Furthermore, since American movies are also screened in countries other than the US, companies owning a fraction of foreign market enjoy the extended exposure of their product placed in those movies. Therefore, it would be interesting to take into account foreign box office figures of movies in addition to their US box office sales and consider their worldwide box office success in the analysis. Below is our second hypothesis:

H2: The sum of worldwide box office figures of all movies featuring a product; that is the total worldwide success of those movies is positively related to the revenue of the firm.

Brand value

Antecedents of brand equity have been determined by a large body of research as brand awareness, recall, and attitude toward the brand. Improvement in brand equity is the result of enhancing consumer's awareness, band association, and brand attitude towards the product (Walsh, Kim, and Ross 2008, Holehonnur et al. 2009, Wiles and Danielova 2009). In addition, research shows that product placement leads to higher brand awareness and enhanced brand attitude (d'Astous and Chartier 2000, and Gupta and Lord 1998). Therefore, we believe that the level of enhancement in awareness and brand attitude resulting from product placement will be higher for the products with higher brand value. In other words, when a product already holds high brand equity and consequently consumers' awareness and favorable brand attitude, the amount of recognition it gains after being placed within a movie is much higher compared to another brand with lower brand value and this ultimately results in higher revenue after the placement. Therefore, we suggest that positively regarded brands play a significant role in improvements in the revenue of the firm after their placements and there is a link between brand value and the success (effectiveness) of product placement. We predict the positive role of brand value of the placed product in the improvements of firm revenue:

H3: The revenue of the firm after placing a product within a movie is positively related to brand value of the product.

Product type

The impact of advertising on potential customers in terms of persuading them to be drawn toward a product and consider a certain product for purchase to some extant depends on the type of the advertised product. We believe that product placement as a non-traditional advertising technique also generates differential impacts depending on the type of the featured product. In other words, incorporating durable products within a movie will induce different influence on potential customers compared to the integration of consumer packaged goods. As opposed to durable goods which do not quickly wear out, last for a long time and are thus normally big ticket items, non-durable goods or consumer packaged goods (CPG) are serviceable for less than three years which makes their interpurchase time shorter. The examples of durable goods are cars, appliances, business equipment, electronic equipment, home furnishings and fixtures, houseware and accessories, photographic equipment, recreational goods, sporting goods, toys and games. According to the definition mentioned above, making purchasing decision for consumer packaged products is more impulse-driven than that for durable products. Therefore, we believe that product placement yields more favorable results for consumer packaged goods and brings about more positive change in the revenue of the firms compared to product placement for durable products. We predict the positive role of interaction of the number of product placements and the type of placed product for consumer packaged goods in the change in the revenue of the firm as a result of product placement:

H4: the interaction of the number of product placements and product type is positively related to the revenue of the firm.

In order to demonstrate the contributions of this study which have been captured through our three proposed hypotheses, our conceptual model which in fact summarizes the focus of all three hypotheses in a straightforward manner has been provide in Appendix A.

Methodology

The objectives of this study, that is addressing the impact of product placement on the sales of a company and examining the relationship between the success of a movie and the sales of the product placed in that movie after its release, dictates the data collection method, the variables involved, and other aspects of sampling procedure. However, common to all data preparation processes, the existing restrictions create some inevitable limitations.

Our sample consists of two categories of variables; main variables which reflect the focus of this study and also control variables. The key variables the interdependence of which constitutes the primary objective of this thesis are as follows; the annual revenue, brand value of the companies that have placed their brands in one or more movies in an 8-year time span (2001-2008), the number of placements purchased by those companies in each year, and the box office figures of movies featuring the respective products.

A considerable part of the data collection procedure has been through the website brandchannel.com which lists all the brands with their respective list of the movies in which they have been placed in each year (data available starting from 2001). The companies which own the placed brands were identified and listed. Therefore, reviewing the dataset, it is possible to see a number of brands of the same company placed in multiple movies, either the same or different ones.

In order to have a more even dataset, companies with sparse product placements over few years were dropped from the sample. Removing a considerable portion of our sample left us with 43 companies most of which are renowned companies in their relevant industries. (Appendix A provides the list of the companies)

The following section provides a detailed explanation of the main variables followed by a review of data collection on control variables.

Data description and measures:

First, we review the main variables and the source we extracted the relevant data from.

Number of product placements: The yearly number of product placements for the selected companies is our first main variable which was obtained from brandchannel.com. The annual number of product placements is in fact the number of movies within which a product has been integrated in a given year. The average number of product placements per year has been provided. (Figure 1)

Revenue: The change in the sales of a placed product which is predicted as the consequence of its appearance in a movie is mirrored in the change in the revenue of the parent company. We collected the yearly sales figures mostly through Compustat and for missing data which pertains to non-US companies we used Osiris database (https://osiris.bvdep.com/ip). The latter lists the data on foreign companies in both their original currency and thousand US dollar with the relevant yearly exchange rate. Therefore, variable REVENUE refers to the total sales of all brands owned by the company in each year.

Brand value: a comprehensive definition provide by qfinance.com for brand value is "the amount that a brand is worth in terms of income, potential income, reputation, prestige, and market value" and thus high brand value is regarded as an important asset to firms. In order to investigate the effect of product placement, in addition to revenue, brand equity (as an indicator of the strength of a brand) of companies whose products were featured in movies was also included in the main variables. In this study, brand equity has been measured as brand value (value operationalization of brand equity is in fact brand value) and it was obtained from BusinessWeek's top 100 global brands in different years. In fact, Interbrand.com provides an annual list of brand value figures of the most valuable brands and publishes it in BusinessWeek. Interbrand's brand valuation methodology includes the following steps: first, market segmentation into homogeneous groups of customers; second, forecasting intangibles earnings for each segment through financial analysis; third, calculating brand earnings by multiplying the intangible earnings by the "role of branding index" which is an indicator determining the percentage of intangible earnings that is attributable to the brand and generated by it and in fact presents the impact of brand on the drivers of demand for the branded business; fourth is called "competitive benchmarking" and entails deriving brand discount rate which reflects the risk associated with the brand's expected earnings and is determined by the competitive strengths and weaknesses of the brand; and finally calculation of brand value or the net present value (NPV) of the expected brand earnings through discounting the brand earnings by the brand discount rate.

Box office: The unprecedented study of the role of the success of a movie in the effectiveness of product placement is the highlight of this study. Moreover, one of the strong benefits of brand integration as a communication strategy is providing an opportunity for companies to easily access foreign markets and capture consumer exposure simply through release of the movie in foreign theatres. Therefore, the success of the movie in both domestic (US) market and foreign market has been incorporated in this study. To this end, the data set includes worldwide box office figures of movies in which the selected 43 companies placed their products. Data for majority of movies was available in the-numbers.com. The other source that provided data missing form the-numbers.com was boxofficemojo.com.

Product type: the list of the companies in our study includes manufacturers of both product categories; durable and consumer packaged goods. We introduced a dummy variable to capture the type of the product produced by each company. This dummy variable takes the value of 1 for companies whose dominant type of product is non-durable (CPG) and zero for the rest which mainly manufacture durable products.

Furthermore, data on a range of other company characteristics as control variables was also collected and they include the followings:

Number of employees; which gives an idea of the size of a company and the magnitude of its operations.

Research and development expense; which indicates the level of competition and also the state of the industry a company operates in.

Leverage ratio; which provides a measure of the way a company finances its operations by calculating the financial leverage of that company. There is not just one single ratio but a number of ratios that yield financial leverage. For instance, the definition of one leverage ratio is the amount of a company's total debt as a fraction (in percentage) of total assets; total assets being the sum of debts and equities. Therefore, data was obtained on the following variables; total assets and total liabilities. Data on the variables mentioned was extracted mostly from Compustat. The supplemental source for data collection was Osiris database (https://osiris.bvdep.com/ip) which helped with missing data from Compustat.

S&P 500; Standard & Poor's 500 Index which is a market value weighted index based on 500 stocks and represents one of the most renowned and commonly used indicators of the overall American stock market. Five hundred leading companies in top industries of the US market are incorporated in the calculation of S&P500 and are selected by a group of economists and analysts at Standard & Poor's as the representatives of the US economy. Capturing 75% coverage of the U.S. equities, the large cap companies entailed in this index render it as a good measure of the US market and in fact yield the definition of the US market. Data on S&P500 is a publicly available dataset which provides this index on daily, weekly, and also monthly basis. To capture the annual state of the U.S. stock market, we extracted the monthly values of S&P500 from http://finance.yahoo.com and calculated the average value of the monthly figures in each year to obtain the annual S&P500 in the corresponding year. What S&P500 represents in addition to the annual state of the market is indeed the effect of time in our analysis.

Analysis, Results, and Discussion

We adopted linear regression modeling approach to examine the aforementioned relationships in the hypotheses. We propose the following linear regression equation:

$$\log(REV_{it}) = C + \beta_1 \log(PP_{it-1}) + \beta_2 \log(BRANDVALUE_{it}) + \beta_3 \log(LEVERAGE_{it}) + \beta_4 \log(RD_{it}) + \beta_5 \log(EMPLO_{it}) + \beta_6 \log(SP_t) + \beta_7 \log(REV_{it-1}) + \beta_8 \log(WWBOX_{it}) + \beta_9 (PROTYPE_i * \log(PP_{it-1})) + \varepsilon_{it}$$

Our dataset consists of observations on a number of variables for several companies over a period of time. In other words we have a time series for several cross sections which generates a panel data set. Therefore, we restructured data to create a panel data set. In the equation above, i and t subscripts (i=1,2,… ,30 and t=1,2,..,8) represent the firms(cross sections) and year of data (time periods), respectively.

In our proposed model REV is the total yearly revenue of the firm which includes the sales of all the brands owned by the firm; C is the intercept; PP is the yearly number of movies in which a firm has placed its products; BRANDVALUE is the annual brand value of the firm; WWBOX is the total box office figures of the movies featuring the firm's product in a given year and is in fact the sum of the box office figures of all the movies in which a firm has placed its product in that year; LEVERAGE is the annual leverage ratio of the firm and presents the financial leverage of the firm; RD is the firm's annual research and development expense; EMPLO is the annual number of the firm's employees; SP represents the annual S&P500 index; and PROTYPE is the type of the placed product which takes the value of 1 for consumer packaged product and zero for durable goods. Also, in order to prevent the problem of the logarithm of a negative number we have added 1 to the values where needed to ensure a positive value to be treated by a logarithm function.

Moreover, as mentioned before we have examined the impact of product placement on firms' revenue in the year following the release of the movie. Therefore, in our model we have incorporated the lagged variable PP_{it-1} and aimed at studying its effect on the revenue of the firm in the year after.

As presented in the "Results of firms' revenue linear regression model" (Table 1), we found that our model substantially fits the data. The significantly high R-squared suggests the high amount of variance explained by the current variables in our model. As shown, R-squared is 0.9925 which means that 99.25% of the total variance is captured by the variables present in our model.

Likelihood-ratio test:

Initially, in order to exclusively capture the specific role of product placement in the change in firms' revenue we implemented the likelihood-ratio test which is applied to compare two models. We generated our null model by eliminating the PP variable from our original proposed model and then compared the fit of the two models through the test. In order for the number of product placement (PP) to have a significant impact on the examination of the revenue of the firm, the alternative model entailing PP should have a significantly better fit. Below are the nested models; M0 and M1; the null and alternative models, respectively;

M1: $\log(REV_{it}) = C + \beta_1\log(PP_{it-1}) + \beta_2\log(BRANDVALUE_{it}) + \beta_3\log(LEVERAGE_{it}) + \beta_4\log(RD_{it}) + \beta_5\log(EMPLO_{it}) + \beta_6\log(SP_t) + \beta_7\log(REV_{it-1}) + \beta_8\log(WWBOX_{it}) + \beta_9(PROTYPE_i{*}\log(PP_{it-1})) + \varepsilon_{it}$

M0: $\log(REV_{it}) = C + \beta_2\log(BRANDVALUE_{it}) + \beta_3\log(LEVERAGE_{it}) + \beta_4\log(RD_{it}) + \beta_5\log(EMPLO_{it}) + \beta_6\log(SP_t) + \beta_7\log(REV_{it-1}) + \beta_8\log(WWBOX_{it}) + \beta_9(PROTYPE_i{*}\log(PP_{it-1})) + \varepsilon_{it}$

As presented in "Results of firms' revenue linear regression model- the null model" (Table 2), the null model is also fitted to the data very well; R-squared is 0.9923 which reflects the 99.23% of the total variation explained by our null model.

The null model has a log-likelihood of 165.7779 and the alternative model has a LL of 168.8749. The value of the test statistic is therefore calculated as shown below;

D= -2(ln (likelihood for null model)-ln (likelihood for alternative model) =

-2 ln (likelihood for null model/likelihood for the alternative model) =

$-2\cdot(165.7779 - 168.8749) = 6.194$

Which is substantially smaller than the critical chi-square value at 0.10 P-value under 1 degree of freedom (3.84) and we thus reject our null hypothesis and conclude that the presence of PP in revenue equation significantly improves its fit to our data which in fact reveals the effect of product placement on revenue under our proposed model.

Hypotheses testing:

In this section, we address our three hypotheses and discuss the results regarding each. H1 deals with the relationship between the number of placements a firm carries out for its products in different movies and the revenue of the firm. In fact, what the first hypothesis suggests is that the higher the number of movies a firm places its brands in, the higher the sales of that firm goes in the year after the screenings of those movies. According to the results of our study, at 10% level of significance the effect of product placement on revenue is significant and it in fact is positively related to the revenue of the firm (β_1= 0.0365, p= 0.0242). Therefore, H1 is supported.

H2 points out to the role of success of the movie in the effectiveness of product placement and suggests that taking into account the box office of the movie in examining the effect of product placement on the revenue of the firm enhances the role of product placement in increasing firm's revenue. H2 indicates that the movie's worldwide box office has a positive effect on the revenue of the firm. However, the results show that contrary to our primary expectation the total box office sales of the movies highlighting a product which is in fact the total exposure of the placed product does not have a significant role in increasing revenue (p= 0.8874). Therefore, H2 is not supported.

What the result of H2 insinuates is that whereas placement of a brand in a high box office and blockbuster film seems evidently valuable in terms of the improvement it brings about in the revenue of the firm, the results show that focusing on box office figure and bearing the enormous cost of placing a product in a popular movie will not guarantee the success of product placement by positive move in revenue. We assume that despite the high cost associated with placing a product in a successful movie, what determines the success of the placement is not necessarily the drivers of movie success (genre, star power, director's reputation, reviews, and so forth). In fact, the more defining factors in the effectiveness of such marketing technique could be on one hand the execution factors such as the level of prominence of the placement, the amount of association with the star, and plot connection and on the other hand the movie elements such as the level of violence, audience absorption and so forth. We believe that in order to provide a perfect reflection of the movie's success level and evaluate the sole impact of box office on firms' revenue the proper study approach would be examining the effect of placing a product in different movies with different levels of success as opposed to integrating them all in one variable. In other words, investigating the change in revenue following the placement of a product in some movies with different box office sales and exploring the effect of each box office figure on the revenue would obtain the ideal approach to this matter.

H3 points out to the role of brand value of the product placed in a movie in the improvements of the revenue of the firm after the placement. Our third hypothesis in fact deals with the obvious relationship between a product's brand value and the revenue of the firm however in the context of product placement which is indeed its contribution. The results confirm our expectation and show that the relationship between the placed product's brand value and the revenue of the firm is highly significant and the high coefficient indicates the strong relationship between the brand value of the product placed and the revenue after the product placement ($\beta 2= 0.1104$, $p=0.0859$). Thus, H3 is supported.

H4 indicates that placement of consumer packaged products yields better results in terms of positive move in the revenue of the firm as opposed to the placement of durable products. However, contrary to our expectation, the results of our study showed that the interaction of the number of product placements and the type of the placed product for non-durable products does not have a significant role in increasing the revenue of the firm ($p=0.4819$). Therefore, H4 is not supported and thus there is not enough evidence to conclude that the effectiveness of product placement is higher for consumer packaged goods. The insignificance of results regarding the interaction effect can be explained by the insufficient number of companies in our sample. Having had a bigger sample of companies, we might have concluded a positive relationship between the positive change in revenue and the combined effect of PP and product type.

Implications for practice

This study provides firm evidence on the effectiveness of product placement and therefore justifies marketers' increasing enthusiasm over this practice as an alternative to the traditional advertising. The results of this study render brand integration as a financially effective technique. Moreover, the outcomes of this work offer some recommendations for placement design and plan .The findings of this study aid marketing managers of firms better plan their product placement portfolios. Two questions that come to mind when it comes to designing a product placement strategy are regarding first the number of movies a firm will place its product in and second the level of success of those movies. Since our results showed the insignificance of the total box office success of movies featuring a product when evaluating the value of product placement, our recommendation is for the managers to not extensively focus on the success of the movies displaying their product and to enhance the effectiveness of their placement by exploring the optimum number of product placements. Nevertheless, as mentioned before, ruling out the importance of box office of movies in the value of product placement should be left to a more exhaustive analysis entailing box office as a separate variable and focusing on the inspection of the revenue's response to each box office level.

Due to the risks associated with the performance of movies, predicting the movies' box office success is creating a challenge for managers before their placement, and the few existing guidelines incorporating certain success factors help managers have only an estimation of the range of the revenue of the firm. In other words, the presence of the drivers of movie success which guarantee the success of the movie to a considerable extent enable managers to approximately assess the performance level of the movie and thereby choose which movies to place their product in. However, due to the nevertheless existing uncertainty involved with the performance of movies and thus indeterminate prediction of the movies' box office, allocating the placement expenses to more than one movie in fact diversifies the risk involved. Moreover, since the results of our study were not in support of the positive relationship between the revenue and movies' box office, excessive focus on the placement in giant box office figures does not appear as a plausible approach for marketers. Therefore, instead of dealing with the hefty cost of buying space in successful movies, firm managers can analyze different combinations of the number of movies and approximate box office to find the best placement approach.

Furthermore, the findings of our study regarding the role of brand value of placed product in increasing the revenue of the firm recommends to the managers that they allocate the largest portion of their placement budget to the highly recognized brands which translates to the brands with high brand value. Relatively speaking, product placement for a slightly or not known brand is not as effective as the integration of an already well-known brand. Targeting to increase potential customers' brand familiarity as the ultimate result of product placement, managers should initially explore other opportunities for improving the brand awareness and recognition and then armed with consumers' basic knowledge of their product step into this marketing technique to enhance the brand recognition.

Limitations and future research

There are some limitations in our study elimination of which will move the results forward to being flawless in explaining the practice and better guiding the practitioners. The limitations of this study can be improved through further research.

The first and the most critical limitation is regarding data deficiency. Due to not having access to monthly data, the data applied in our study was annual data. Firms place their products in movies that are released in various seasons of a year and that in fact creates changes in the revenue of the firm during the months following the release of the movie. In other words, assessment of annual revenue might not display the true effect of placement in each movie and the influence of its characteristics including its box office success on the revenue. Applying monthly data for revenue facilitates the immediate and also distant but gradual increments in the revenue of the firm. Moreover, since the release date of the movies is available, incorporating monthly data on revenue, brand value and control variables enables us to separately examine the effect of box office sales of each movie on the firm revenue. In fact, what led us to add up the box office success of all movies featuring a product in our analysis was the lack of monthly data. Monthly data assists us in looking into the relationship between the revenue and the box office at least during the months between the screenings of different movies featuring the same product. Future research can better address the financial value of product placement and examine the impact of product placement and the role of movie success on firms' revenue through employing monthly data.

The second limitation of this study is related to the availability of data regarding product placement which covers only the range of 2001-2008. No data has been released before this period and this will affect the generalizability of the results of our study. Having had access to a wider time period of data, we could have better examined the relationships among the main variables over time.

The third limitation of our study is the uneven list of companies in terms of possession of foreign market. Not all the firms in our study own an equal fraction of foreign market. Some of them have tremendous international awareness toward their brand and their foreign market revenue constitutes a considerable portion of their total revenue and some do not enjoy the same broad foreign market and thus international recognition. The problem with this unevenness is the difference in the amount of recognition and attitude change toward the placed product after the screening of the movie. In other words, a foreign country's market might react differently to the placement of an already popular brand in their country as opposed to a country unfamiliar with the brand name. Further research can examine the value of product placement with two sets of companies each consisting of similar companies in terms of foreign trade.

The fourth limitation of this study is not taking into account the type of industry that firms operate in. Movie placement can have dissimilar effect for different types of industries. Future research can categorize companies based on the type of product they place in movies in terms of industry and capture the difference in the industries through introducing a dummy variable corresponding to various industries. Alternatively, SIC (Standard Industry Classification Code) which in fact determines the type of industry a company operates in can be added as a control variable to the model.

Moreover, this thesis focuses on the change in firms' revenue in the year following the placement of their data in movies and thereby investigates the approximately immediate impact of sales of a movie on a placed product's sales. An alternative and better way to approach this topic would be taking into account the aspect of time passed since the appearance of a product in a movie and its influence on studying the impact of product placement on the success of the parent company and this necessitates tracing the variables over a period of time. Therefore, an interesting avenue for research could be following up on this relationship over a few years after the release of the movie and approaching this topic through time series analysis methods.

Furthermore, due to removing a huge amount of data to incorporate only the firms with more than five years of product placements in movies we ended up with only 43 companies in our sample which did not lead to significant results regarding the interaction of the number of movies a firm placed its product in and the product type. Having access to more years of data available regarding product placement, future research can more precisely look into this topic.

Finally, we assume that branding strategy will influence the findings of our study. The fact that companies adopt different strategies to introduce their products to the market can and will affect the outcomes of their marketing approaches. Product placement can also yield dissimilar results depending on companies' branding strategy for their products. The incorporated companies in our study include both the companies with the same brand name for all their products and companies that adopt various brand names for their different products. Although the latter constitute the majority of our data, the more precise approach would be to account for the branding strategy through introducing a dummy variable that captures the branding tactic companies set out to sell their product.

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Tables and Figures

Table1. Results of firms' revenue linear regression model

Dependent Variable: LOG(REV+1)
Method: Panel Least Squares
Date: 09/13/10 Time: 17:18
Sample: 2001 2008
Periods included: 8
Cross-sections included: 30
Total panel (unbalanced) observations: 219

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.1045	0.6384	-1.7301	0.0853
LOG(PP(-1)+1)	0.0365	0.0161	2.2724	0.0242
LOG(BRANDVALUE)	0.1104	0.0639	1.7269	0.0859
LOG(LEVERAGE)	0.1902	0.061	3.0744	0.0024
LOG(RD)	0.3507	0.0515	6.8042	0.0000
LOG(EMPLO)	0.1671	0.0528	3.1634	0.0018
LOG(SP)	0.1419	0.0780	1.8186	0.0706
LOG(REV(-1))	0.4214	0.0620	6.7973	0.0000
LOG(WWBOX+1)	0.0008	0.0058	0.1418	0.8874
PROTYPE*LOG(PP(-1)+1)	0.0168	0.0239	0.7048	0.4819

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.9926	Mean dependent var	10.3694
Adjusted R-squared	0.9910	S.D. dependent var	1.2999
S.E. of regression	0.1234	Akaike info criterion	-1.1861
Sum squared resid	2.7427	Schwarz criterion	-0.5825
Log likelihood	168.87	Hannan-Quinn criter.	-0.9423
F-statistic	631.4152	Durbin-Watson stat	1.1453
Prob(F-statistic)	0.0000		

Table2. Results of firms' revenue linear regression model- the null model

Dependent Variable: LOG(REV+1)
Method: Panel Least Squares
Date: 09/13/10 Time: 16:24
Sample: 2001 2008
Periods included: 8
Cross-sections included: 30
Total panel (unbalanced) observations: 219

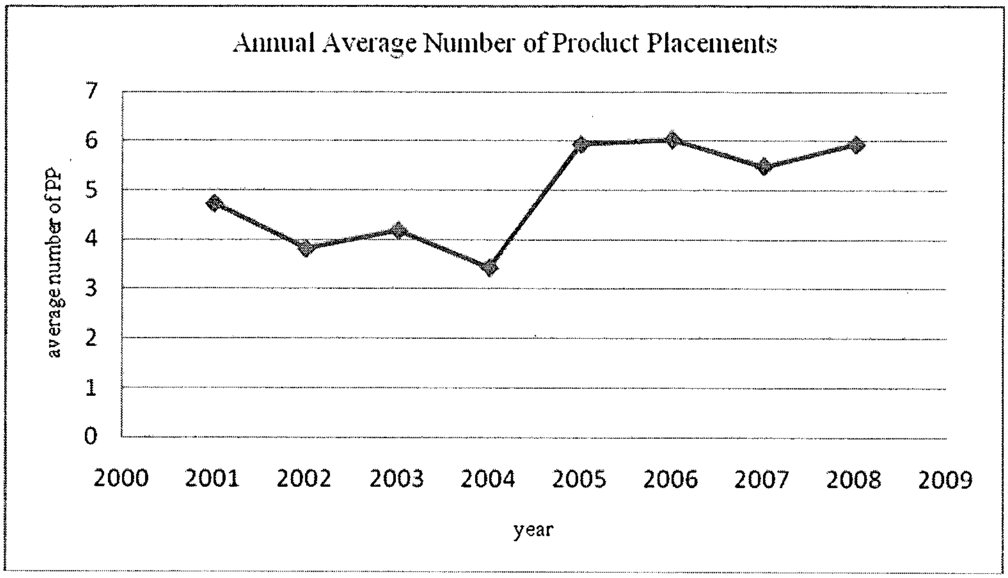
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.1096	0.6457	-1.7185	0.0874
LOG(BRANDVALUE)	0.1017	0.0645	1.5757	0.1168
LOG(LEVERAGE)	0.2054	0.0622	3.3038	0.0011
LOG(RD)	0.3689	0.0515	7.1620	0.0000
LOG(EMPLO)	0.1584	0.0533	2.9736	0.0033
LOG(SP)	0.1415	0.0789	1.7930	0.0746
LOG(REV(-1))	0.4243	0.0627	6.7684	0.0000
LOG(WWBOX+1)	2.73E-06	0.0059	0.0005	0.9996
PROTYPE*LOG(PP(-1)+1)	0.0463	0.0203	2.2784	0.0239

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.9923	Mean dependent var	10.3694
Adjusted R-squared	0.9908	S.D. dependent var	1.2999
S.E. of regression	0.1249	Akaike info criterion	-1.1669
Sum squared resid	2.8214	Schwarz criterion	-0.5789
Log likelihood	165.7779	Hannan-Quinn criter.	-0.9294
F-statistic	633.7621	Durbin-Watson stat	1.1779
Prob(F-statistic)	0.0000		

Figure1.



Annual Average Number of Product Placements
average number of PP
7
6
5
4
3
2
1
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
year

Appendix A

List of companies

No.	company name	No.	company name
1	ADIDAS	23	DAIMLER AG
2	AMERICAN EXPRESS CO	24	MICROSOFT CORP
3	APPLE INC	25	MOTOROLA INC
4	BMW	26	NESTLE SA/AG
5	ANHEUSER-BUSCH COS INC	27	NIKE INC
6	CANON INC	28	NINTENDO CO LTD
7	COCA-COLA CO	29	NOKIA (AB) OY
8	DELL INC	30	PANASONIC CORP
9	DISNEY (WALT) CO	31	PEPSICO INC
10	EBAY INC	32	PHILIPS ELECTRONICS (KON) NV
11	FEDEX CORP	33	PORSCHE
12	FORD MOTOR CO	34	THOMSON REUTERS PLC
13	GOOGLE INC	35	SAMSUNG
14	HARLEY-DAVIDSON INC	36	ROYAL DUTCH SHELL PLC
15	HEINZ (H J) CO	37	SONY CORP
16	HEWLETT-PACKARD CO	38	STARBUCKS CORP
17	COMPAQ COMPUTER CORP	39	TIFFANY & CO
18	HONDA MOTOR CO LTD	40	TOYOTA MOTOR CORP
19	JOHNSON & JOHNSON	41	VOLKSWAGEN AG
20	KELLOGG CO	42	Audi
21	LVMH	43	WRIGLEY (WM) JR CO
22	MCDONALD'S CORP	44	YAHOO INC

Conceptual model: