# Understanding of the Day of the Week Effect in Online Consumer Behaviour

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While marketing has long recognized the impact of seasonality on consumer behavior, there has been little research on other timing factors that impact consumer behavior. One exception is retail research which has used scanner data to analyze patterns in consumer purchases. There is however, a rich history of research on the day of the week effect within the finance literature. This research stream has demonstrated that individual behavior and preferences impact the pureness of the market. Using website visits over a two year period, this research confirms the day of the week effect in web site traffic and extends the understanding through an analysis of daily market share changes in 114 website categories.

## INTRODUCTION

The day of the week effect has been researched for over 40 years within the finance literature. Cross (1973) found that some trends in the stock market were predictable based on the day of the week. This finding was in direct contrast to finance theory, and yet was gradually shown to be a robust concept. The key issue noted in the long standing research stream is that individual behavior impacts the market, even if it is counter-theoretical.

While there has been some research into the marketing implications of the day of the week, it has focused primarily on retail sales database analysis. An exception is the work of Bussiere (2011) which found that industry web site traffic varied based on the day of the week. This current study extends that research.

## LITERATURE REVIEW

Understanding the impact of the day of the week has been a research question in the finance literature for over forty years (Cross 1973). In the initial study, he looked at 27 years of S&P 500 data to analyze investment returns in the US. He found a significant difference in rates of return between Monday and Friday -- with Monday returns being lower than Friday.

Within the finance literature these results have been confirmed and extended to multiple time periods and international exchange locations (Cornell, 1985; Dyl & Maberly, 1986; Islam & Sultana, 2011; Keim, Stambaugh, & Rogalski, 1984; Rogalski, 1984). The finance literature has also moved beyond rates of return to include and confirm the day of the week effect in stock volatility (Campbell & Hentschel, 1992; Chan, Karolyi, & Stulz, 1992; Keim, Stambaugh, & Rogalski, 1984; Lakonishok & Levi, 1982; Nelson, 1991; Neumann & Skiadopoulos, 2015) and international settings (Alexakis & Xanthakis, 1995; Corhay, Fatemi, & Rad, 1994).

There is less use of the day of the week variable in the marketing literature. To a large degree, the marketing literature's consideration of timing as a factor in consumer behavior has focused on seasonality (Burruss & Kuettner, 2002; Kapoor, Madhok, & Wu, 1981; Mentzer, 1988; Thomas, 1993).

Prior to Bussiere's (2011) work on the day of the week effect on web behavior, only research based on retail sales data had approached the variable in the marketing literature (Chapados et al, 2014; Davis & Berger, 1988; Kim & Park, 1997; Lam, Vandenbosch, & Pearce, 1998).

Using industry level data from Hitwise.com, Bussiere (2011) found significant day of the week differences in industry-level web traffic. The study demonstrated that focusing on day of the week activity provided insight that had been unavailable with weekly or monthly data. While 18 industries were analyzed, the primary focus of the research was to verify the day of the week effect – and how Entertainment focused web sites differ in web volume compared to Business & Finance based web sites. Business and finance focused web sites were found to be busier Monday to Friday, while Entertainment web sites were found to be busier on weekends. The article also noted that two key limitations of the research were its focus on industries as established by the data source and the treatment of seasonality separate from the day of the week effect.

This study addresses these two limitations. Specifically, this current study industry level categorization used in the Bussiere (2011) article. In addition, this analysis includes seasonality.

## METHODOLOGY

This study uses daily web site traffic data from approximately 10 million Americans to extend the understanding of the day of the week. The data consists of two years (February 2013 – January 2015) of daily web traffic market share amongst US internet users. The database for this study was provided by Hitwise.com, a web traffic data amalgamator. The dataset categorizes the web traffic into 114 broad web site groupings (e.g. newspaper websites, basketball web sites, religious websites, etc.). All data are composite daily market share.

Consistent with the finance literature, Bussiere (2011) analyzed the market share data the core regression formula (i):

(i)     $M_i = a_i + b1_i\text{TUE} + b2_i\text{WED} + b3_i\text{THU} + b4_i\text{FRI} + b5_i\text{SAT} + b6_i\text{SUN} + e_i$

where $M_i$ is the internet market share for industry i, and TUE, WED, THU, FRI, SAT, and SUN are dummy variables for the day of the week. The coefficients $b1_i$ through $b6_i$ are the difference between the industries Monday market share and others days' market share.

In order to extend the understanding of the day of the week effect in online consumer behavior, regression equation (i) was altered to acknowledge the move away from industry level data. This is accomplished by simply shifting to equation (ii):

(ii)    $M_C = a_C + b1_C\text{TUE} + b2_C\text{WED} + b3_C\text{THU} + b4_C\text{FRI} + b5_C\text{SAT} + b6_C\text{SUN} + e_C$

where $M_C$ is the internet market share for industry C.

The final change to the regression that is necessary for this research study is to control for seasonality. This is accomplished through the introduction of monthly variables:

(iii)   $M_C = a_C + b1_C\text{TUE} + b2_C\text{WED} + b3_C\text{THU} + b4_C\text{FRI} + b5_C\text{SAT} + b6_C\text{SUN} +$
        $s1_C\text{FEB} + s2_C\text{MAR} + s3_C\text{APR} + s4_C\text{MAY} + s5_C\text{JUN} + s6_C\text{JUL} + s7_C\text{AUG} +$
        $s8_C\text{SEP} + s9_C\text{OCT} + s10_C\text{NOV} + s11_C\text{DEC} + e_C$

where $M_C$ is the internet market share for industry C, and FEB through DEC are dummy variables for the month of the year. The coefficients $s1_C$ through $s11_C$ are the difference between the industries January market share and other months' market share. The Statistical Package for the Social Sciences (SPSS) was used to perform the Ordinary Least Squares (OLS) regression.

## FINDINGS

Evaluating equation (iii), the study found significant and substantial support for the day of the week effect in online consumer behavior. Of the 114 categories of websites analyzed, only 17 displayed no day of the week effect.

## Table 1 Approximately Here

Of particular interest are the 26 website categories that see market share increases on weekdays, the 40 website categories that see market share increases on weekends, and the 17 website categories that display no day of the week effect.

### Weekday Dominant Websites

Websites that display strong weekday market share represent 15.16% of the website traffic analyzed in this study. The three groupings that demonstrate stronger weekday web traffic confirm but refine one of the findings of Bussiere (2011): "The findings seem to indicate that during the week, people deal with serious issues: business, investments, government issues,

health questions, medical issues, and school/education. In effect, consumers are in a utilitarian mode. They are taking care of the essentials." (p. 424).

Consistent with the earlier findings, any of the categories with strong weekday market share are more serious in nature.

There is a strong business and finance component (banking, consulting, freight and transportation, marketing, utilities, legal, manufacturing, web hosting, office supply stores, wholesale suppliers, book publishing, professional organizations and the resource industry. Accounting and Telecommunication company websites, however, display no day of the week effect.

Health and government related websites also display weekday dominant behavior, including city and federal government sites, pharmacies, general health info and advice sites, pharmaceutical company sites, hospitals and other health organizations and health research. Finally, print media and broadcast media websites also experienced market share strength on weekdays.

Taken together, this focus on serious web sites and content (business, health, insurance and news media) confirms Bussiere (2011). There are several categories within those same industries, however, that run counter to those trends. This indicates the importance of research at the category rather than industry level.

**Table 2 Approximately Here**

**Weekend Dominant Websites**

Websites that display strong weekend market share represent 66.01% of the website traffic analyzed in this study – due largely to the fact that social network fit into this category and represent almost a third (32.3%) of all the website traffic.

 The three groupings that demonstrate stronger weekend web traffic confirm but refine one of the findings of Bussiere (2011): "In contrast, activity shifts as the weekend approaches. Activity moves away from utilitarian issues and toward more fun, hedonistic issues: food and drinks, gambling, and entertainment. The week is done. The essentials are covered. People are able to shift their activities to a more hedonistic mode." (page 424)

While this current study does provide overall support for the findings of Bussiere (2011), analyzing website categories rather than amalgamated industries allows for additional insight. Restaurant , food websites and gambling websites do see increases on weekends, as do entertainment categories such as fine arts, books, photography. Games and movie sites all experience strong weekend traffic. In a similar way, earlier findings about lifestyle web sites (including dating, house and garden, pets, religion, children's and hobby websites also continue to display strong weekend activity).

Most types of shopping websites show weekend strength, including clothing, department stores, sporting goods, intimate apparel, toys and videos. Most sporting sites also experience weekend growth, but skate boarding, snow sports, water sports and tennis display no day of the week effect. Interestingly, while some team sports display a positive weekend effect, football, basketball and hockey are dominated by seasonality over a day of the week effect.

In direct contrast to earlier findings, computer hardware, software and graphics display weekend dominant behavior. Social networking sites, the largest market share holder throughout the week display higher market share from Thursday to Sunday.

Bussiere (2011) found no day of the week effect in Automotive Industry websites. The current study found that analyzing categories of websites rather than the amalgamated data for the complete industry exposes some day of the week effects. For example, automotive and motorcycle manufacturer websites display significant market share growth on Saturday and Sunday.

Taken together, these results confirm and refine the notion of a day of the week effect in online consumer behavior. Weekdays are dominated by more functional website activities, including business, government and health. Weekends, in contrast, are more social and lifestyle focused.

## IMPLICATIONS AND FUTURE RESEACH

This research provides confirmatory evidence of the day of the week effect in online consumer behavior. It supports the notion of a utilitarian weekday mode and a hedonistic weekend mode. The use of data at the category rather than industry level has allowed this research to refine the understanding of the boundaries of those modes.

This insight will help businesses to alter their online presence and expectations based on the day of the week. So, for example, an automotive manufacturer may benefit from knowing that consumers prefer to visit their site on weekends rather than weekdays when seeking product information. But they should also note that issues dealing with the financing and insuring of those same vehicles are best dealt with on weekdays. So the weekend becomes the promotional opportunity, but the weekdays provide the opportunity to work through the logic of the actual transaction.

Because individuals have full choice over their web browsing activities, it is assumed that this online consumer behavior is also predictive of offline behavior. Future research could attempt to understand offline consumer behavior in the context of the day of the week and consumer modes.

This study focused exclusively on American internet users. It would be beneficial to compare behavior across international consumer groups.

The nature of the dataset does not allow for same-consumer analysis. We cannot know if the behavior of individuals is changing based on the day of the week or if the people online is changing. Further research would be helpful.

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**Table 1: Summary of Findings**

| PEAK DAYS | # Categories | Market Share |
|---|---|---|
| Monday - Friday | 11 | 11.52% |
| Monday - Thursday | 9 | 2.47% |
| Monday - Wednesday | 6 | 1.16% |
| All Weekday Dominant | 25 | 15.16% |
| Saturday & Sunday | 26 | 15.28% |
| Friday - Sunday | 9 | 49.98% |
| Thursday - Sunday | 5 | 0.76% |
| All Weekend Dominant | | 66.01% |
| Mixed Timing | 31 | 14.24% |
| No Day of the Week Effect | 17 | 4.59% |
| TOTAL | 114 | 100.00% |