

E-Commerce and the Financial Valuation of Companies

By

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Throughout the past decade it has been widely recognized that the internet is having a major impact on the transformation of the economy. The introduction of the internet has led to changing the way firms internally and externally conduct business. Specifically, it has been noted that, “E-commerce...has emerged as a major force in reshaping the nature of commerce in general.”¹ The purpose of this paper is to look at the financial valuation of companies that have successfully launched a website for the purpose of online retail sale. In particular, to understand if the addition of website sales has increased the value of companies through stock prices, volume, sales and earnings per share.

The next section of this paper will look briefly into the background of how the internet has impacted business internally and also at how these changes affect the consumer. In addition, there is a discussion on both how these advances have caused traditional “bricks and mortar” stores to expand their business to the online world, and the results of this new ‘hybrid’ type of business. Afterwards, there is an explanation of the data used in the regressions, the actual models tested and a review of the expected results. Finally, the actual results of this study are presented and a summary follows in which the proposed financial valuation of companies is evaluated.

Literature Review

There have been many articles and studies conducted that explore the internal effects of the internet on firms and industries alike. In one particular study, Robert Litan and Alice Rivlin describe potential expenditure saving measures the internet has

¹ Globerman, Roehl, Standifird, “Globalization and Electronic Commerce: Inferences from Retail Brokering”, *Journal of International Business Studies*, Vol. 32, No. 4, Palgrave Macmillan Journals, 4th Quarter, 2001, p. 749.

introduced such as “...significantly reducing the cost of many transactions necessary to produce and distribute goods and services,” along with “...increasing management efficiency.”² Using these examples, they then went on to predict estimated cost saving numbers that the economy will see because of the Internet.

Others continue to study the changes the Internet has brought about by discussing how it allows companies to “design products remotely” and “reduces the need for vast inventories.” It has been argued that the introduction of new technologies, such as the Internet, “...do more than just create new firms and consumers products. They change the way that firms throughout the economy do business.”³ In fact, these transformations are felt in more than just internal improvements; consumers are also affected by the changes brought about by the internet.

Consumers are now supplied with an endless amount of information regarding products and services through on-line reviews, product comparisons, and on-line samples. These types of lower search costs are beneficial to customers in two ways: the opportunity cost of time spent searching for specific products & services, and monetary expenditures in such things as making phone calls, driving to different stores, and paying for magazine subscriptions. Another way in which the consumer experience has been enhanced is that, “The internet also has potential for using histories of consumer purchase behavior to suggest future purchases, or bundles of purchases, of which consumers might otherwise have been unaware.”⁴ One particular firm that uses this technological

² Litan, Robert and Rivlin, Alice, “Projecting the Economic Impact of the Internet”, *The American Economic Review*, Vol. 91, No. 2, Papers and Proceedings of the Hundred Thirteenth Annual Meeting of the American Economic Association (May, 2001), p.314.

³ Litan, Robert, “The Internet Economy”, *Foreign Policy*, No. 123 (Mar. – April, 2001), p. 16.

⁴ Borenstein, Severin and Saloner, Garth, “Economics and Electronic Commerce”, *The Journal of Economic Perspectives*, Vol. 15, No. 1 (Winter, 2001), p. 7.

advancement is Babycenter.com. This company has customized its service to the point of “...knowing the stage of pregnancy of an expectant mother...to provide individually tailored information and products.”⁵

These types of advances the Internet is capable of providing, some argue, have caused traditional “bricks and mortar” firms to realize “...the threats and opportunities from electronic commerce...” and have led some companies to develop “...their own on-line initiatives.”⁶ By launching into the world of online retail shopping, these businesses are now opening their firms to 24/7 sales, potentially increasing their customer base and creating the opportunity for improved customer customization.

Other types of internet studies look at the international trade effect of e-commerce. In particular, one study used a sample of 56 countries and found that there was “...an increasing and significant impact from 1997 to 1999”⁷ on total trade flows because of the Internet. In addition to the discussion of trade flows, this study mentioned the idea of a reduction in racial and ethnic differences, “...the overall effect of the web should be to lessen historically determined inequalities in trading patterns and to increase export opportunities for developing countries, thus reducing global inequality.”⁸

Because all types of firms continue to take advantage of the internet, it has been stated “...that Internet and conventional retailers are becoming more like each other and that the ‘hybrid’ retailer will become the dominant type.”⁹ In addition, there are actual statistics that support this notion of the ‘hybrid’ firm. Robert Litan reported that “As of

⁵ Borenstein, Severin and Saloner, Garth, “Economics and Electronic Commerce”, *The Journal of Economic Perspectives*, Vol. 15, No. 1 (Winter, 2001) p. 5.

⁶ Borenstein, Severin and Saloner, Garth, “Economics and Electronic Commerce”, p. 4.

⁷ Freund, Weinhold, “On the Effect of the Internet on International Trade”, Board of Governors of the Federal Reserve System, International Finance Discussion Papers, Number 693, December 2000, p. 1.

⁸ Freund, Weinhold, p. 25.

⁹ Litan Robert and Rivlin, Alice, “Projecting the Economic Impact of the Internet”, p. 315.

December 2000, seven of the 10 most popular Web sites in the United States were internet divisions of offline retailers.”¹⁰

Since the introduction of Internet firms, studies have been conducted to measure the financial valuation of such businesses. For example, one study hypothesized how “...current traffic at an Internet firm’s web site(s) will be positively related to future revenues, since it reflects potential future demand for the company’s products.”¹¹ This study found that measuring Internet usage did “...provide incremental explanatory power for stock prices.”¹²

On the other hand, some argue that instead of seeing bottom line profit increases, “...a significant component of the value of information technology is its ability to enable complementary organization investments such as business processes...productivity increases...improvements in intangible aspects of existing products.”¹³ This type of reasoning suggests that investment in computers may cause higher returns than what is portrayed through traditional accounting methods.

Data

In this study three particular retail companies were examined, all of which are traded on the New York Stock Exchange (NYSE). Ann Taylor (ANN) is listed on the NYSE under the consumer services industry as an apparel retailer, Ethan Allen (ETH) is

¹⁰ Litan, Robert, “The Internet Economy”, p. 18.

¹¹ Trueman, Wong, Zhang, “The Eyeballs Have It: Searching for the Value in Internet Stocks”, *Journal of Accounting Research*, Vol. 28, Supplement; Studies on Accounting Information and the Economics of the Firm (2000), p. 138.

¹² Trueman, Wong, Zhang, “The Eyeballs Have It: Searching for the Value in Internet Stocks”, pp.137-138.

¹³ Brynjolfsson, Erik and Hitt, Lorin, “Beyond Computation: Information Technology, Organizational Transformation and Business Performance”, *The Journal of Economic Perspectives*, Vol. 14, No. 4 (Autumn, 2000), p. 24.

listed under the consumer goods industry as a furnishing company, and Barnes and Noble (BKS) is also listed under the consumer services industry as a specialty retailer. Since all three of these companies are publicly traded the financial data was able to be collected from the Yahoo Finance website for the daily stock prices and volume statistics, and the Wharton Research Data Services website for the quarterly sales, stock prices, and earnings per share statistics. In addition, the date each company announced it would be launching a website for online retail sales and the actual day the website went live were found using Bloomberg.

The information gathered from the Bloomberg terminal indicated that of these three companies Barnes & Noble was the first to announce that it would be launching a World Wide Web site on January 28, 1997. This website officially launched on May 13, 1997. Ethan Allen publicized it would be selling its products online on July 29, 1999 and the company followed through with its promise when it "...opened the virtual doors..."¹⁴ on January 18, 2000. It wasn't until May 24, 2000 that Ann Taylor finally revealed that it would be selling its products online and on November 8, 2000 the company announced the official launch of its online store.

The trend over the past few years has certainly been for retailers to add online shopping as an option for their customers in addition to the traditional "bricks and mortar" stores. It has been largely assumed that those companies that are able to successfully launch an online website for shopping have an advantage over their competitors. However, when online shopping was first becoming popular, consumers and companies alike were a bit skeptical if e-commerce was a channel worth opening.

¹⁴ "Ethan Allen Launches Dynamic New Website", Bloomberg L.P., Danbury, Conn, Business Wire, Jan 18 2000, p. 1.

For example, Ethan Allen reported that by selling its products on the internet by the beginning of 2000, it had "...a head start over its peers as other home-furnishings makers are wary of selling online."¹⁵ Now in the year 2005 most agree that e-commerce is necessary for companies to stay competitive and consumers and shareholders alike are becoming less skeptical and more supportive of online shopping.

In following the guidelines of other event studies¹⁶, the daily statistics for this analysis were gathered beginning one day before each company announcement through one year of that particular date, with the dummy variable being significant the day of, before, and after each announcement. This expanded event window was used to capture a case in which "...the market may acquire information...prior to the actual announcement..." and to reveal "the price effects of announcements which occur after the stock market closes on the announcement day."¹⁷ The quarterly data was collected for five years both before and after the actual launch date of each company's website (with the exception of Barnes & Noble which only began to trade on the NYSE during 1993), and the dummy variable in these instances was significant beginning the quarter the website went live and through the following five years.

Model

Several different regressions were tested in this study of e-commerce and the financial valuation of companies. The first regression conducted examined the stock

¹⁵ "Ethan Allen Plans to Sell on the Internet by Late September", Bloomberg L.P., July 29, 1999.

¹⁶ Thompson, Rex, "Empirical Methods of Event Studies in Corporate Finance." R. Jarrow et al., Eds, Handbooks in OR & MS, Vol. 9 (1995), p.973.

¹⁷ MacKinlay, A., "Event Studies in Economics and Finance" *Journal of Economic Literature*, Vol. 35, No. 1 (March 1997), p. 15.

price on the day each company first announced it would be launching a website to test the “...expectation of the ultimate valuation effect.”¹⁸ This regression was the following:

$$\text{Stock Price} = \beta_0 + \beta_1(\text{Announcement Date}) + \varepsilon$$

The expected result of this regression for all of the companies tested is that because of the optimism surrounding each of these announcements, the public would purchase more stock that day, thereby causing the stock price to rise in anticipation of the future profit and sales of the company.

Secondly, the following regression was used to examine the official launch date affect, in which each company announced that its online website was live, on its stock price:

$$\text{Stock Price} = \beta_0 + \beta_1(\text{Launch Date}) + \varepsilon$$

The expected result is again that the launch date of a company website for online retail sale will have a positive correlation with the stock price of the company, respectively. The reason both the original announcement date and the actual launch date were included is because the former should capture the anticipation of future expansion leading to increased profits and a larger customer base, while the latter reveals the actualization of a company promise and the belief that a website will help the company to expand.

Coinciding with the stock price effect that is expected to occur on the announcement and launch dates, is the effect on the volume traded. Therefore, the following regression was tested on the announcement date for each company:

$$\text{Volume} = \beta_0 + \beta_1(\text{Announcement Date}) + \varepsilon$$

¹⁸ Thompson, Rex, “Empirical Methods of Event Studies in Corporate Finance.” p. 968.

On the day a company announces it plans to launch a website, it is expected that the volume traded of its stock increases. This reasoning is because current stakeholders are expected to react to the news by believing this website will improve the profitability of the company and they will therefore buy additional shares. Or, if they believe that this is an unwise decision by the company, they will sell their stock accordingly. For those not already invested in this company, those who believe that the company will flourish because of this decision will also buy stock on the day of the announcement.

The next regression tested, studied the affect of the announcement that the official website was launched on the volume traded of a company stock:

$$\text{Volume} = \beta_0 + \beta_1(\text{Launch Date}) + \varepsilon$$

The expected result is again a positive correlation between the launch announcement and volume. Due to similar reasoning of the effect of this announcement on the stock price, those who believe the company will prosper because of online retail sale are expected to invest in the company once the website is open for business.

Once the website was up and running, the regression below was then run to see if this caused a change in company sales:

$$\text{Sales} = \beta_0 + \beta_1(\text{Launch Date}) + \varepsilon$$

There are a couple of reasons that for this particular regression the expected result is that once a website is launched sales will increase. One reason is that regardless of where a consumer may reside (even if it is an entire state from an actual store location), a customer can now purchase the exact item they wish from this company from the convenience of their own home. In addition, with an online website consumers can make purchase 24 hours a day and sales are no longer limited to store hours.

The final regression conducted in this study tested the effect of the launch of the website on the earning per share/stock price of a company:

$$\text{EPS/Stock Price} = \beta_0 + \beta_1(\text{Launch Date}) + \varepsilon$$

This regression was conducted to test efficiency. Do earnings per share increase for each dollar invested in the company? Once again, it was expected that there is a positive correlation – a company should become more effective once it has launched its website.

Results

The table below summarizes the results of the regressions showing the effect of the first announcement that each company would be launching a website.

The Effect of an Announcement for a Company Website on its Stock Price

| Variables | Ann Taylor Results | Barnes & Nobles Results | Ethan Allen Results |
|-------------------|---|---|--|
| Constant | β : -0.00015 t-statistic: -0.05563 | β : 0.00068 t-statistic: 0.53179 | β : -0.00047 t-statistic: -0.19770 |
| Announcement Date | β : -0.00544 t-statistic: -0.21411 | β : 0.02014 t-statistic: 1.69864 | β : -0.003323 t-statistic: -0.14663 |
| | R^2 : 0.00018 n: 254 | R^2 : 0.01132 n: 254 | R^2 : 0.00008 n: 254 |

The results depicted in the table above indicate that the announcement saying a company plans to launch a website for online retail sale does not correspond with an abnormal stock price return for the company on those three event days. Perhaps a reason the announcement date is not a significant variable in effecting the stock price is because two of the companies used in this study (Ethan Allen and Barnes & Noble) were among the first in their industries to reveal plans of online retail sale. Therefore, it may have been

the case that investors were ‘wary’ of the effect of this and did not jump at the chance for investment in the company. On the other hand, Ann Taylor did not announce plans for a website until 2000, while some of its competitors had websites years before this. In this situation perhaps investors did not believe that the website would lead to increased profits, but rather, that launching a website was simply a necessary step to stay competitive within the industry.

The next table displays the results of the effect that the actual launch date had on company stock prices.

The Effect of a Launched Website Announcement on Company Stock Prices

| Variables | Ann Taylor Results | Barnes & Nobles Results | Ethan Allen Results |
|------------------|---|---|---|
| Constant | β : -0.00024 t-statistic: -0.07837 | β : 0.00027 t-statistic: 0.22326 | β : -0.00034 t-statistic: -0.19585 |
| Launch Date | β : 0.01703 t-statistic: 0.59488 | β : 0.01089 t-statistic: 0.94791 | β : 0.01402 t-statistic: 0.86032 |
| | R^2 : 0.00140 n: 254 | R^2 : 0.00355 n: 254 | R^2 : 0.00292 n: 254 |

Consistent with the previous regression results, this table shows that the date a company launched its website did not have a direct effect on its stock price. In fact, the R^2 term indicates that for all three companies the website launch announcement accounts for less than 0.4% of the stock price change for those particular event days. Perhaps a reason that the launch date is not a significant variable in this regression may be that the public would rather wait and see the effects of the website through future sales and so forth before investing further into the company.

The subsequent regression looked at the change that occurred in the volume traded of a stock on the date a company announced its future plans for a website.

The Effect of an Announcement for a Company Website on its Stock Volume

| Variables | Ann Taylor Results | Barnes & Nobles Results | Ethan Allen Results |
|-------------------|---|---|---|
| Constant | β : 0.25513 t-statistic: 2.82300 | β : 0.35756 t-statistic: 3.74809 | β : 0.15840 t-statistic: 3.19306 |
| Announcement Date | β : -0.04567 t-statistic: -0.05492 | β : -0.37364 t-statistic: -0.42564 | β : 0.11609 t-statistic: 0.25430 |
| | R ² : 0.00001 n: 254 | R ² : 0.00071 n: 254 | R ² : 0.00025 n: 254 |

The non-significant t-statistics of these three regressions indicate that the volume traded of each stock was not affected by the company announcement of its plans for a future website. In fact the R² term shows that the announcement accounted for less than 0.072% of the volume traded on those particular days. This is a puzzling result. The incredibly small effect could lead one to believe that the announcements were not very well publicized and that is why the public did not appear to react to the news. The efficient markets theory is based on the "...notion that stocks already reflect all available information..."¹⁹ and therefore one would tend to believe that a company news announcement would immediately cause a change in the volume traded of a company stock. On the other hand, perhaps this regression appropriately coincides and supports the previous regression findings that this news announcement did not significantly affect the stock price or the volume traded.

The next regression looked at the effect on the volume traded on the actual day the announcement was made that the website was launched.

¹⁹ Bodie, Kane, Marcus, *Investments*, McGraw-Hill/Irwin, New York, 2005, p. 371.

The Effect of a Company Website Launch Announcement on its Stock Volume

| Variables | Ann Taylor Results | Barnes & Nobles Results | Ethan Allen Results |
|------------------|---|---|---|
| Constant | β : 0.33502 t-statistic: 3.15995 | β : 0.28571 t-statistic: 4.37920 | β : 0.16932 t-statistic: 3.71834 |
| Launch Date | β : 0.72954 t-statistic: 0.74782 | β : -0.03165 t-statistic: -0.05272 | β : -0.10148 t-statistic: -0.24219 |
| | R^2 : 0.00221 n: 254 | R^2 : 0.000001 n: 254 | R^2 : 0.00023 n: 254 |

The insignificant t-statistics depict that stockholders did not expect much of a change in the company because of a new website. Once again, it is a bit perplexing to see that when a company opens an additional channel for sales, it does not have a significant impact on the trading of its stock.

After testing the effects of website launch announcements on different company statistics, this study then went a step further and studied the impact of the website on company financial indicators since the time online retail sale began. The following regressions tested the effect of the launch of a website on total company sales.

The Effect of a Company Website Launch on its Sales

| Variables | Ann Taylor Results | Barnes & Nobles Results | Ethan Allen Results |
|--------------------|---|---|---|
| Constant | β : 0.00106 t-statistic: 0.27226 | β : 0.15617 t-statistic: 1.75999 | β : 0.03287 t-statistic: 2.15290 |
| Launch Date | β : 0.00375 t-statistic: 0.66225 | β : -0.03284 t-statistic: -0.28396 | β : -0.02298 t-statistic: -1.08132 |
| % Change in Assets | β : -0.07392 t-statistic: -1.05748 | β : -0.89677 t-statistic: -1.46248 | β : -0.17224 t-statistic: -0.66521 |
| | R^2 : 0.03547 n: 41 | R^2 : 0.05380 n: 41 | R^2 : 0.04476 n: 41 |

These results indicate that company sales have not been significantly impacted by the launch of a website. Despite the added convenience of shopping from home, consumers and stockholders have not taken advantage of this opportunity by shopping over and above their usual amount of shopping. Perhaps this is indicative of why some have argued, "...that for most goods and services, the on-line and off-line worlds are (at least imperfect) substitutes for one another."²⁰ The reason the launch of a company website does not significantly affect the sales of a company may be because now consumers will shop online instead of coming into the store.

The final regressions conducted tested the affect of a website launch on the earnings per share of a company.

The Effect of a Company Website Launch on its EPS/Stock Price

| Variables | Ann Taylor Results | Barnes & Nobles Results | Ethan Allen Results |
|------------------|---|---|---|
| Constant | β : 0.00971 t-statistic: 5.84820 | β : 0.00389 t-statistic: 0.77034 | β : 0.01991 t-statistic: 21.57403 |
| Launch Date | β : 0.00250 t-statistic: 1.00093 | β : -0.00107 t-statistic: -0.16499 | β : -0.00414 t-statistic: -3.21076 |
| | R ² : 0.02504 n: 41 | R ² : 0.00082 n: 35 | R ² : 0.20906 n: 41 |

Based on these results, Ethan Allen does in fact have a significant t-statistic for its regression. However, the expected results were not realized in this case because the coefficient is negative, thereby indicating that the EPS/Stock Price has declined since the website was launched. It is important to note that in this case the coefficient is a relatively small number of -0.4%. Therefore, even though this indicator has been affected by the website, the amount this statistic is moving because of the website is not

²⁰ Borenstein, Saloner, "Economics and Electronic Commerce", *The Journal of Economic Perspectives*, Vol. 15, No. 1, American Economic Association, Winter, 2001, p. 11.

great. Furthermore, just because the launch of Ethan Allen's website has proven to statistically affect earnings per share, the reason for the decline in earnings per share is not necessarily indicative of the website launch alone. There are many other factors that affect this indicator that have not been included in this regression.

The results of these regressions for Ann Taylor and Barnes & Noble show that the t-statistics were insignificant for both companies. This indicates that the launch of the website has not significantly impacted the efficiency of either of these companies.

Conclusion

The results of this study were far from the expected results. Testing the day a company announces it will be launching a website and the day it actually did launch its website did not affect company stock prices or volume. These same companies have not seen an improvement in their sales, or EPS/Stock Price since they began selling their products online. These statistics alone portray a dismal outlook on the benefits of launching a website. None of the expected benefits in this particular study were realized.

That being said, it is important to realize that this study was conducted only on three very specific companies. It would certainly be beneficial to test many more companies using the same factors to find out if a large portion of companies do in fact see the expected results of this study. Or, the study could be slightly altered to compare all companies within the same industry. The results could then be analyzed to understand if certain companies within the same industry are largely affected by the launch of a website while other companies simply are not.

A different type of study that may be interesting to conduct would be to compare the efficiencies of companies within the same industry. In this type of test, the efficiency of companies that successfully launched a website for online retail sale could be compared to companies that have never launched a website. In this case, one would not necessarily be assessing only the financial valuation of companies based on their website, but rather analyzing the broader benefits realized by companies that integrated into the online world.

The results of this study indicate that from a financial stand point, the value of a company does not necessarily increase because it launches a website for online retail sale. However, many economists nonetheless agree that the internet is beneficial to most firms. Because e-commerce is a relatively new way of conducting retail sales, the different ways to measure the benefits of company websites are still being examined. The traditional regression analysis and accounting measures do not appear to capture the full benefits companies are experiencing due to their websites. Using this study as a base, while continuously refining and updating it, will allow for improved assessment of the financial valuation of companies based on their website.

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