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Investigating the Impact of Firm Strategy – Click-and-Brick, Brick-and-Mortar, and Pure-Click – on Financial Performance

Myung Ko
Department of Information Systems and Technology Management
The University of Texas at San Antonio
myung.ko@utsa.edu

Narcyz Roztocki
School of Business
State University of New York at New Paltz

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Department of Information Systems and Technology Management
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Narcyz Roztocki
School of Business
State University of New York at New Paltz
roztockn@newpaltz.edu

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ABSTRACT: Attracted by the numerous benefits of E-commerce, many traditional brick-and-mortar firms have embraced the Internet to supplement their business operations and have adopted the "click-and-brick" approach. Despite these changes, insufficient empirical research has been conducted on the impact of different firm types on financial performance. Based on the resource-based view, this study presents empirical research examining the possible ramifications and an overall impact. This study does this by comparing financial performance of click-and-brick firms with the performance of traditional, as well as pure-click firms that rely solely on the Internet.

INTRODUCTION

The Internet has transformed the way organizations conduct their business today. The number of firms that take advantage of Internet technology increased rapidly in the late 1990s and early 2000s. Subsequently, E-commerce sales increased continuously and will continue increasing, according to Forrester Research. In 2007, E-commerce sales in the U.S. reached $175 billion (excluding travel); this was a twenty-

one percent increase from 2006. In fact, Forrester Research predicts that E-commerce sales will reach $204 billion in 2008 and $334.7 billion in 2012: a surge of growth rising approximately fourteen percent annually from 2007 until 2012 (Rosencrance 2008). In contrast, the sales at physical stores are expected to grow only 2.6% annually for the same period.

In essence, there are three types of firms that differ in adopting Internet to their business operations. The first type of firms are companies that operate their business transactions exclusively in an electronic online market and are heavily dependent on the Internet (Koo, Koh and Nam 2004). These firms are called online firms, "pure plays", Internet firms, dotcoms, or "pure-click" (hereinafter refer to as PC) firms (Mahadevan 2000). These firms interact with customers solely through the Internet website and without any face-to-face contact (Enders and Jelassi 2000). In contrast to the PC firms, the second type of firms are the traditional firms, or "brick-and-mortar" (hereinafter refer to as BM) firms. The BM firms conduct only traditional business operations with physical stores and do not use Internet as the means of E-commerce. These firms have only face-to-face contact with their customers via physical locations. The websites of these firms, if present, are used to disseminate information about the firm, the firm's products and/or services, and the firm's physical locations (Saeed, Grover and Hwang 2003). The third type of firms, "click-and-mortar," also referred to as "click-and-brick" firms, (hereinafter refer to as CB) conduct their business using both means: traditional physical stores and the Internet. Accordingly, firms can be classified based on physical locations, E-commerce capability, and the degree of Internet usage as summarized in Table 1.

Table 1: Firm Classification

Firm Type	Physical Locations	E-commerce Capability	Degree of Internet Usage
Pure Click (PC)	No	Yes	Heavy

| Brick-and-Mortar (BM) | Yes | No (information only) | Minimum |
| Click-and-Brick (CB) | Yes | Yes | Less than heavy |

Since CB firms can wield the strength of both BM and PC firms, at first look, the CB firm type appears to be the most promising one in achieving better financial performance than the BM approach or PC approach. While there are a number of previous studies that have focused on each type of firm or the transformation from BM to CM firm (Bellman 2001; Ranganathan, Goode and Ramaprasad 2003; Razi, Tarn and Siddiqui 2004; Venkatraman 2000), there is little empirical research that has investigated whether financial performance of CB firms are, indeed, superior to firms that conduct their business exclusively online or only by utilizing traditional physical stores. However, understanding the impact of the firm strategy in regard to Internet utilization on financial performance is extremely important. This lack of empirical evidence provides motivation for our study.

The objective of this study is to explore the potential impact of firm types on financial performance and to investigate whether firms using the CB approach indeed perform better than firms using either PC strategy or BM strategy when the industry and firm size are controlled.

CONTRIBUTION

This paper makes several important contributions to the information systems research. First, to our knowledge, this study is the first empirical study examining the impact of all three different types of firm strategy: click-and brick, brick-and-mortar, and pure-click, on the financial performance. While there are a number of previous studies that have focused on each type of the firms or theoretical approach converting to the click-and-mortar from brick-and-mortar firms, empirical evidence showing the impact of

firm strategy on financial performance is lacking. Hence, the purpose of this study is to fill this gap by examining profit and cost ratios.

Second, this study employs the "matched sample comparison group" methodology in sample selection as a control for any confounding factors caused by the firm size and industry differences. This methodology has not been used in this research topic yet, although it is widely used in the field of accounting literature, in addition to appearing in a few IT productivity studies (Bharadwaj 2000; Hunton, Lippincott and Reck 2003). Our study demonstrates that this approach is highly useful when investigating the impact on financial performance that is caused by the differences in firm strategy.

Third, this study provides empirical evidence that firm type has a substantial effect on financial performance. Accordingly, the click-and-brick firms are able to achieve higher profits than brick-and-mortar or pure-click firms. Furthermore, our results suggest that the average costs of the click-and-brick are lower than costs of pure-click firms. Thus, this study also provides theoretical and managerial implications.

Fourth, our study demonstrates that a resource-based view can serve as the underlying theory that explains the differences in financial performance of click-and brick, brick-and-mortar, and pure-click firms.

Overall, this study is expected to be important to researchers focusing on the impact of firm (or e-commerce) strategy and business managers who are facing increasing competition.

TYPES OF FIRM STRATEGY AND RESEARCH HYPOTHESES

Internet as a Strategic Tool

PC firms are those that conduct their business transactions solely over the Internet, hence creating "virtual" businesses that exist only on the Internet (Razi et al. 2004). Thus, business processes of PC firms are heavily dependent on the Internet

(Koo et al. 2004). These firms are not restricted by limitations of physical channels, can gain access to wider markets, are able to bypass intermediaries, offer so-called "24/7" access, and generally are more flexible in their operations (Chan and Pollard 2003; Steinfield, Adelaar and Lai 2002a; Steinfield, Adelaar and Liu 2005). Using the Internet, the PC firms can sell their products or services directly to the customers and also collect more valuable information from their customers while keeping their prices competitive (Lee, Lee and Larsen 2003). Since the Internet helps reduce transaction costs, such as search, negotiation and settlement costs, these firms are considered to have competitive advantage over traditional firms (Steinfield et al. 2002a). Examples of the PC firms are Amazon, Expedia, Yahoo, and Google.

In contrast to the PC firms, BM firms distribute their products and provide services solely using physical channels. Although, these firms might use the Internet to provide information to their customers and other interested parties, online interfaces for business transactions over the Internet are not used. These BM firms are considered to have some advantages over the Internet firms because of established brands, good relationships with vendors, and greater access to products (Chan and Pollard 2003). An example of this type of firm is Michael's Store Inc.

Since the late 1990s, in order to stay competitive, provide additional service to their customers and to improve their bottom line, many BM firms have adopted the Internet as a supplement to traditional operations. Because of this move they have become CB firms. Obvious advantages of the CB firms are well-established brand names and the presence of a long-term customer base. Thus, these firms can often attract additional online customers at a fraction of the costs that comparable PC firms have to spend (Bellman 2001; Chang, Jackson and Grover 2003; Saeed et al. 2003). Their online customers also have a choice to return the purchased items either by mail or to the store at any location at their convenience, which is another advantage of CB

firms (Chan and Pollard 2003; Porter 2001; Zhu 2004). A survey by Jupiter Media Matrix indicates that eighty-three percent of online customers would prefer to return their purchases at physical stores (Saeed et al. 2003).

The phenomenon of embracing CB strategy is not limited to traditional BM firms. While many traditional firms embrace the Internet as an additional means to reach out to their customers, some Internet firms embrace traditional, physical distribution channels to reach customers preferring transactions at physical locations; Bluemercury.com is an example of this type, which sells cosmetics on-line, but is establishing several physical stores (Clarkson 2000; Saeed et al. 2003). In addition to cost savings in inventory, labor, distribution, and marketing/promotion, CB firms have advantages in reaching distant geographic markets while expanding product scope and depth (Steinfield et al. 2002a). Target, Office Depot, Charles Schwab, UPS, and Dell are examples of CB firms.

For the reasons discussed above, it is likely that embracing one of the three firm approaches (CB, BM, or PC) will have an impact on financial performance.

Measuring Financial Performance

Among many methods to measure financial performance, such as net income, earnings per share, and economic value added, financial ratios are the most commonly used approach (Altman 1968; Barney 1997; Beaver 1966; Bharadwaj 2000; Hunton et al. 2003). According to a rich body of research, ratio analysis has played an important role in evaluating the financial health of companies and predicting business failures (Altman 1968; Beaver 1966; Bose and Pal 2006; Chen and Shimerda 1981). For the purpose of measuring the financial performance, this study uses five profit ratios (ROA, ROS, OI/A, OI/S, and OI/E) and two cost ratios (COGS/S and SGA/S). All seven ratios are commonly used metrics for the performance measures and were applied in the

previous studies (Bharadwaj 2000; Santhanam and Hartono 2003). The ratios and their

descriptions are shown in Table 2.

Table 2: Financial Performance Measures

Ratio	Description
Profitability	
ROA	Net Income / Total Assets
ROS	Net Income / Net Sales
OI/A	Operating Income before Depreciation / Total Assets
OI/S	Operating Income before Depreciation / Net Sales
OI/E	Operating Income before Depreciation / Employee
Cost	
COGS/S	Cost of Goods Sold / Sales
SGA/S	Selling & General Administrative Expenses / Net Sales

Impact of Firm Type on Profitability and Costs

Profitability, or the difference between total revenues and total costs, is an important

measure of firm performance. Profitability is crucial for long-term prosperity, growth, and

survival of any for-profit organization. Subsequently, total costs gauge the company's

ability of using its resources wisely.

According to many authors, use of the Internet and other supporting technologies

promotes organizational efficiency and effectiveness (Boyer 2001; Chen 2003; Straub

and Klein 2001; Venkatraman 2000). For example, firms using Internet for business

operations are reporting benefits from low transaction costs and reduced inventory

(Motiwalla, Khan and Xu 2005; Steinfield et al. 2002a).

In particular, since CB firms have strengths of both personal interaction and

online access (Bellman 2001), the addition of the Internet channel should have a positive

impact on performance. The addition of E-commerce related capital enables companies

not only to reach new customers while increasing business volume, but also to

streamline and utilize existing resources better.

According to the resource-based view (RBV) theory, resources are the keys in

achieving competitive advantage and long-term profitability (Barney 1991; Wernerfelt

1984). A company can achieve and sustain a competitive advantage if it posses a set of strategic resources that are perceived as valuable, rare, and difficult to imitate by the competitors (Barney 1991). The resources could be classified as physical capital, human capital, and organizational capital (Barney 1991).

Following RBV, a company is successful when the firm strategy matches its resources and the most precious resources are utilized efficiently (Grant 1991). Frequently, strong information technology infrastructure appears to be a valuable resource as it helps to better utilize other existing resources, in addition to being difficult to imitate (Ray, Muhanna and Barney 2007; Wade and Hulland 2004). To this end, a robust e-commerce platform in CB firms could potentially add to better utilization of resources as compared to similar BM firms.

Consequently, it could be reasonably expected that CB firms would be able to have higher profitability and lower costs than other traditional BM firms and based on the RBV theory, the following two hypotheses are proposed:

H1a: Click-and-brick (CB) firms have higher profit ratios when compared to the performance of the brick-and-mortar (BM) firms that are in the same industry and of similar size.

H1b: Click-and-brick (CB) firms have lower cost ratios when compared to the performance of the brick-and-mortar (BM) firms that are in the same industry and of similar size.

Many PC firms started their business with the expectation of high revenues combined with low costs. In reality, however, the revenues were not as high as expected while the costs soared (Razi et al. 2004). Many of the PC firms, which started with

several employees and initial capital from investors, initially lacked physical, human, and organizational resources.

In other words, the PC firms needed to transform their financial assets into physical, human and organizational resources, which then, according to RBV, could be used for achieving competitive advantage (Barney 1991; Wernerfelt 1984). However, in reality, building a set of resources that are valuable, rare and difficult to imitate is a lengthy and costly process.

Thus, high start-up costs of the PC firms that resulted from the initial lack of resources are not surprising. In particular, the high start-up cost could be attributed to overspending on marketing to increase the customer base, additional expenditures for shipment costs due to improper back-end distribution operations, and expenses related to dealing with returned items (Bellman 2001; Razi et al. 2004).

Today, many of the PC firms have been in operation for several years and successfully have managed to survive the dot-com crash. In spite of these good records, obtaining and maintaining a set of strategic resources is a challenging and expensive process. Moreover, conducting business on the Internet is highly competitive and benefits are difficult to capture. Thus, the average profitability is expected to suffer even for established PC firms (Porter 2001; Razi et al. 2004). High costs for obtaining new Internet customers still seem to be an issue for PC firms (Reichheld and Schefter 2000). In addition, many of the PC firms are still too small in order to fully benefit from the economies of scale.

In contrast, since CB firms have existing, strategic resources such as established brands, traditional distribution channels, and long-lasting relationships with vendors, these companies can attract customers for about one fourth the cost of the PC companies (Chan and Pollard 2003). Moreover, (in some type of industries) customers

may prefer traditional face-to-face contact with highly trained salespeople, supported by online operations.

Although the use of technology improves efficiency, many PC firms need to dedicate a substantial portion of their budget to technology infrastructure. Frequently, this is done in an effort to stay ahead of the traditional competitors, or to grow quickly (Razi et al. 2004), but many of these investments do not produce tangible benefits. In addition, because the PC firms are lacking appropriate infrastructure, most of them must outsource the shipping and handling of physical goods to external providers. However, as the PC firms' product breadth and depth increase, the coordination with the growing number of external suppliers becomes extremely complex and costly. Products may run short, shipments may be delayed and errors may arise (Enders and Jelassi 2000).

Furthermore, even very modest technical problems may severely hurt the business operations of PC firms (Benbunan-Fich and Fich 2005; Razi et al. 2004). Thus, as observed by Subramani and Walden (2001) the costs of conducting E-commerce are "real and staggering" while the benefits are uncertain.

In contrast to the PC firms, CB firms are less dependent on technology so they can invest in technology more wisely. In addition, CB firms may be able to utilize their resources more efficiently. For example infrequently purchased goods no longer need to be stocked up at many physical stores, but they can be ordered online from a central storage location. Using the physical stores as the pick-up or returning location for online purchases can reduce the utilization level of resources needed for product delivery and handling activities (Chan and Pollard 2003; Steinfield, Adelaar and Lai 2002b). Thus, building on RBV, it could be reasonably expected that CB firms would be able to achieve a higher profitability and lower costs than PC firms and the following two hypotheses are proposed:

H2a: Click-and-brick (CB) firms have higher profit ratios when compared to the performance of the pure-click (PC) firms that are in the same industry and of similar size.

H2b: Click-and-brick (CB) firms have lower cost ratios when compared to the performance of the pure-click (PC) firms that are in the same industry and of similar size.

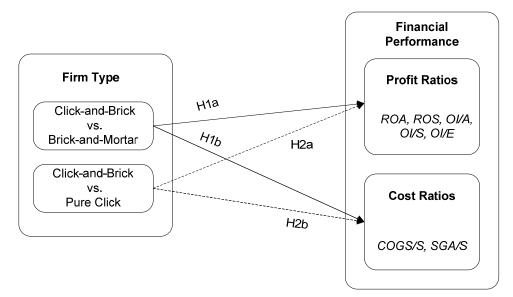The research model is depicted in Figure 1.

Figure 1: Research Model

RESEARCH METHODOLOGY

The "matched sample comparison group" methodology is used to explore the potential differences in financial performance among CB, BM, and PC firms. This methodology common in the accounting, finance, and marketing fields, is not widely used in information systems research and only introduced in a few information technology productivity studies (Bharadwaj 2000; Hunton et al. 2003). This methodology appears to be most appropriate to test our hypotheses because it selects the firms that

are matched by size and industry and thus, it helps to control the effects of confounding factors due to size and industry differences.

Sample Selection

The "matched sample comparison group" methodology for the hypotheses testing required three sub-samples of CB, BM, and PC firms. We started the data collection process by establishing a list of PC firms. This was a deviation from the standard "matched sample comparison group" methodology, in which the main sample is assembled first, followed by the matching sample or samples. We had to modify the standard procedure since the absolute number of established PC firms was relatively small. Moreover, the majority of PC firms are fairly small in size as measured by the number of employees or their total assets. Thus, in our study, we first established a list of PC firms, then for each of the firms on our list we looked for matching BM or CB firms.

To compile a list of suitable PC firms, we used multiple sources such as our own Internet search, published lists and reports. From this initial list of several hundred Internet firms, many firms were removed using the following two selection criteria. First, the potential PC firm had to be included in *Compustat* with complete data from 2000 to 2004. Second, the selected firm had to be a PC firm. To ensure that all selected firms actually were PC firms, we examined the description of a firm's business in the latest annual reports (SEC filings of 10-K) and searched for the terms "online" and "on-line" since the firm described its online operations in the report (Garbi 2002). For some firms this classification was not easy, thus, the firm's website was examined to verify our classification as PC firm. A given company was classified as a PC firm only if it had an ordering system but not physical locations.

Overall, many of the firms from the original list were deleted for following reasons: a large number of companies went out of business, merged with another firm,

or the data from the period of 2000 to 2004 was incomplete. Moreover, some of the firms in the original list established physical locations and were not pure Internet firms. Thus, our preliminary list was reduced to forty-seven PC companies.

To select matching BM firms that are comparable to the PC firms on the list, we performed the following steps. To control for the industry and the firm size, firms from the same primary two-digit code as the given PC firm were selected from *Compustat* and identified as potential matching firms. Then, we used total assets and annual sales as the size measure, which are commonly used as proxies for the firm size and chose the firm that has the closest to the corresponding PC firm's values reported in 2001. When no comparable BM firms were available, we followed steps taken in Barber and Lyon's (1996) study. First, we allowed the size measures to be between 70 percent and 130 percent of the PC firm's total assets and annual sales. Next, we used either total assets or annual sales to match. We then used a one-digit SIC code to select a matching BM firm. Also, we searched the websites for all the potential BM firms. If the company did not have a website or if the website provided information only and there was no ordering online capability, we classified the given company as a BM firm.

To select matching CB firms, we followed the same matching procedure as for the BM firms. Once a potential firm was selected, the company's website was evaluated carefully to make sure that it was a CB firm. First, we made sure that the potential firm had physical locations. Then, we searched its website and examined if an online ordering system was provided. Only those firms that have both physical locations and online ordering systems were considered for the sample of CB firms.

Many of the CB firms were too large to match with PC firms on the list. Overall, we could only identify matching CB firms for less than half of the PC firms (twenty-one out of fourty-seven). As a consequence, our sample was reduced to twenty-one CB firms and twenty-one PC firms.

To assure that the relative firm size of all three groups (CB, BM, and PC) was comparable, one-way Analysis of Variance (ANOVA) parametric tests and Kruskal Wallis for non-parametric tests were carried out using the SPSS software package. The classical F-test is known to be misleading when the populations have different variances (Kulinskaya, Staudte and Gao 2003) and Welch's ANOVA is recommended for most cases, especially when variances are not equal.

Since the data analysis indicated that variances are not equal, we additionally tested Welch's ANOVA instead of ANOVA as shown in Table 3. On average, PC firms' total assets and sales were slightly larger than the other two groups. However, the p-values for total assets (0.107) and sales (0.224) indicate that means are not significantly different. Also, the P-value from the Kruskal Wallis test indicated the same results as well. Therefore, it could be reasonably assumed that the size of BM and CB firms are comparable to that of the PC firms.

Table 3: Descriptive Statistics for the Three Groups of Firms

Variables	Pure Click (PC) Firms		Brick & Mortar (BM) Firms		Click & Brick (CB) Firms		Welch's ANOVA (p value)	Kruskal Wallis (p value)
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.		
Total assets (in million)	1,850.1	3,285.9	1,107.9	1,541.1	1,154.5	1,878.2	2.261 (0.107)	1.787 (.409)
Sales (in million)	671.6	1,047.9	621.6	977.1	492.9	570.9	1.510 (0.224)	1.180 (.554)

In summary, our final sample included twenty-one CB, twenty-one BM, and twenty-one PC firms from 2000 to 2004. As a result, 315 data points were included in our analysis.

RESULTS

We tested the hypotheses by comparing the means of five profit ratios and two cost ratios for the group of twenty-one CB firms with the means of the groups of twenty-one BM and twenty-one PC firms.

Results of the Mean Difference between CB and BM Firms

The hypotheses 1a and 1b were tested by investigating potential differences in seven financial ratios for CB firms and BM firms. The overall mean difference for each financial performance ratio, as indicated by the t-statistics from the parametric t-test and the non-parametric Z-statistics from the Mann-Whitney tests, is depicted in Table 4. The breakdown of annual results from 2000 to 2004 is shown in Table 5.

A positive sign before the test statistics indicates that the average performance of the CB firms is higher than that of the BM firms while a negative sign indicates otherwise.

Table 4: Overall Mean Differences between CB and BM Firms

All 5 Years		
Performance Measures	**T**	**Z**
Profit Ratios		
ROA	2.098**	2.881*
ROS	2.684*	2.306**
OI/A	3.538*	4.514*
OI/S	1.232	1.559
OI/E	0.983	0.849
Cost Ratios		
COGS/S	-1.561	-1.480
SGA/S	0.198	0.726

*   1 % level
**   5 % level

Table 5: Performance Differences between CB and BM Firms by Year

Performance measures	2000		2001		2002		2003		2004	
	T	Z	T	Z	T	Z	T	Z	T	Z
Profit Ratios										
ROA	-0.593	0.918	1.042	0.566	1.755***	1.547	1.513	1.899***	1.435	1.572
ROS	-0.362	0.734	0.960	0.214	1.665	0.843	2.251**	2.050**	1.947***	1.648***
OI/A	0.379	1.421	1.639	2.075**	2.644**	2.679*	2.708*	2.428**	1.632	1.371
OI/S	-0.180	0.113	0.356	0.541	1.279	1.195	1.140	1.094	0.774	0.465
OI/E	-0.969	-0.337	-0.726	0.104	-0.328	0.861	0.241	1.043	0.997	0.243
Cost Ratios										
COGS/S	0.031	0.038	-0.721	-0.641	-0.906	-0.943	-0.866	-0.893	-0.994	-0.918
SGA/S	0.125	-0.013	0.212	0.327	-0.186	0.202	0.002	0.202	0.285	0.692

* 1 % level
** 5 % level
*** 10 % level

Results of the analysis were as follows: First, as shown in Table 4, overall profitability of the firms using CB strategy was significantly higher than the firms using BM strategy except for OI/S and OI/E. On a yearly basis, the profit ratios from non-parametric tests were all positive in each year from 2001 except for OI/E, but all except OI/A show the negative in 2000 from the t tests. The positive values indicate that the average performance measures of firms using CB strategy were higher compared to those using BM strategy. Although values shown by years were positive, they were not significant in all ratios in every year. Overall, H1a was partially supported.

COGS to Sales ratios were negative except for the year 2000. This means the firms using CB strategy were more efficient than those using BM strategy since *COGS to Sales* was lower for the firms using CB strategy compared to the firms using BM strategy. Results of SGA to Sales ratios were shown mixed. However, none of the cost ratios were statistically significant. Thus, H1b was not supported.

Results of the Mean Difference between CB and PC Firms

We tested the hypotheses 2a and 2b by investigating potential differences in performance between CB firms and PC firms. Table 6 summarizes the results of the mean differences of financial ratios between firms using CB strategy and PC strategy overall. Table 7 describes the breakdown of annual results from 2000 to 2004. Again, we performed both parametric Welch t and non-parametric Mann-Whitney tests. A positive sign before the test statistics indicates the performance of the firms using CB strategy was higher than that of firms using PC strategy.

Table 6: Overall Mean Differences between CB and PC Firms

All 5 Years		
Performance Measures	T	Z
Profit Ratios		
ROA	3.488*	4.691*
ROS	3.326*	3.985*
OI/A	5.165*	6.912*
OI/S	4.327*	5.184*
OI/E	1.064	2.604**
Cost Ratios		
COGS/S	-2.364**	-2.304**
SGA/S	-2.187**	-1.656***

* 1 % level
** 5 % level
*** 10 % level

Table 7: Performance Differences between CB and PC Firms by Year

Performance measures	2000		2001		2002		2003		2004	
	T	Z	T	Z	T	Z	T	Z	T	Z
Profit Ratios										
ROA	1.535	2.075**	2.541**	2.905*	2.357**	2.578*	1.803***	2.729*	0.860	0.314
ROS	2.118**	2.377**	2.312**	2.780*	2.358**	2.226**	1.367	1.748***	0.781	0.314
OI/A	1.751***	3.082*	2.979*	3.383*	3.986*	3.685*	3.747*	3.308*	1.599	1.547
OI/S	2.682**	2.578*	2.864*	2.905*	2.778*	2.654*	1.624	2.101**	0.901	1.119
OI/E	1.496	0.912	2.073**	2.543**	1.662	1.565	0.630	1.069	1.021	-0.339
Cost Ratios										
COGS/S	-1.396	-1.195	-1.351	-1.321	-0.974	-0.918	-0.864	-0.968	-0.554	-0.591
SGA/S	-1.834***	-1.677	-1.224	-1.097	-0.791	-0.567	-0.172	-0.164	-0.043	-0.138

*   1 % level
**   5 % level
*** 10 % level

Results of the analysis were as follows: First, as shown in Table 6, overall profit ratios of the firms using CB strategy were higher than the firms using PC strategy and statistically significant in all the results except for OI/E from t-test. Furthermore, overall cost ratios were also lower and statistically significant, which indicated higher performance of CB firms than that of PC firms.

On a year to year basis, the profit ratios from non-parametric tests were all positive in each year except for OI/E in 2004. Except for 2004, results from non-parametric tests indicated that all ratios but OI/E were statistically significant. On a cost ratio analysis, overall cost ratios were negative, which indicated that cost ratios of CB firms are lower than those of PC firms. However, they were not significant. Thus, both H2a and H2b are partially supported.

Results of our study are summarized in Table 8.

Table 8: Summary of the Results

Hypothesis	Supported?	Results
H1a	Partially	Click-and-brick (CB) firms have higher profit ratios when compared to the performance of the brick-and-mortar (BM) firms that are in the same industry and of similar size
H1b	No	Click-and-brick (CB) firms have comparable cost ratios to the brick-and-mortar (BM) firms that are in the same industry and of similar size.
H2a	Partially	Click-and-brick (CB) firms have higher profit ratios when compared to the performance of the pure-click (PC) firms that are in the same industry and of similar size.
H2b	Partially	Click-and-brick (CB) firms have lower cost ratios when compared to the performance of the pure-click (PC) firms that are in the same industry and of similar size.

Firms in our sample are from various industries and their products could be digital or physical. Since our level of analysis is the firm level performance measures, our results refer to all types of products the sample firms sold during the year in which we tested.

DISCUSSION

There are several important findings in our study. First, the results of our analysis confirm that CB firms achieve the highest level of profitability. In line with our expectations derived from RBV theory, firms that use Internet to supplement the existing physical channels of distribution and interaction are able to achieve a higher level of profitability than firms using only a physical channel or those that conduct business solely over the Internet. This seems to indicate that the CB strategy creates synergy effects which benefit the profitability (Steinfield et al. 2002b). Second, contrary to our expectations, the cost structures of CB firms seem to be comparable to the cost structure in BM firms. Third, CB firms are profitable and able to achieve higher efficiency than PC firms, which is reflected in lower costs.

Theoretical Implications

The Internet has been used for doing business for over a decade. This presents a tremendous opportunity for academic researchers to conduct empirical studies on types of firm strategy that is based on the level of Internet usage for firm's business. However, many of the earlier studies were based on observations or case studies with a limited number of firms. For example, many authors focused on a few successful PC firms, such as eBay and Amazon (Javalgi, Cultler and Tood 2004), while others focused on failed PC firms such as boo.com and pets.com (Thornton and Marche 2003).

Our results imply that many earlier observations must be revalidated with empirical data. For example, the results of our empirical investigation indicate that the average efficiency of the BM firms does not necessarily lag behind the efficiency of CB firms. While CB firms had seemed to be efficient, compared with BM firms in our sample, our study did not show any significance unlike that of many earlier studies, which claimed using the Internet will generally improve the efficiency (Boyer 2001; Straub and Klein 2001). This discrepancy in the results clearly deserves academic attention and revalidation studies.

Managerial Implications

Our results seem to be very important for managers in the PC firms who are facing increasing competition from CB firms. Our results suggest that even after several years of operations, overall financial performance of the PC is still lower than the CB. Thus, the managers in PC firms should focus on ways to improve their profitability and cost structure. To achieve this, PC firms need to increase sales volume without sacrificing any product margin. Areas to address this issue could be as following: have a contingency plan for any unexpected situations, such as sudden change in market demand or environment; increase product quality and product differentiation; and

provide better support for sales and after-sales services to ensure long-term relationships with customers (Gefen 2002; Razi et al. 2004). Overall, our research indicates that many PC firms are still struggling to achieve a satisfactory level of profitability and, thus, managing PC firms is extremely challenging and demands a high level of creativity.

Limitations and Opportunities for Future Research

As all research projects, our study is not without limitations. Many of these limitations provide opportunities for future studies. The firms that were included in our sample are only public firms; thus, generalizability of our results is limited. Second, sample size in our study is very small. This is due to the small size of PC firms that need to be matched with CB firms that are usually larger. While the results of overall performance indicated significance, those related measures from year to year tests did not indicate significance in some cases. We believe increasing sample size may help reduce this problem. Third, PC firms in our sample are the ones that survived from dot.com failure or ones that are not merged and, thus, it may be biased. Fourth, our research included data for the years from 2000 until 2004. Considering the rapid development of e-commerce, using more current data could be more helpful to managers and researchers. Future research may consider a longer time period, more recent data, and a larger sample of firms.

Additionally, future research may focus on the process of transition from one firm type to another by using case study approach. For example, one research opportunity could be an examination of a PC firm that is converting to CB firm through adding physical locations. Another study could be looking at the products sold by various firms and investigate which products are more attractive to be acquired online and which at physical locations. Also an investigation about the characteristics of buyers preferring a

particular channel is highly promising. Finally, a different future study may replicate our research by using data from outside the USA and compare the results with our study.

CONCLUSIONS

In this paper, we investigated how different firm types may affect the overall firm performance. The results of our analysis implied that firm type that is based on the level of Internet usage actually has an impact on firm performance. For example, firms that fully rely on the Internet for conducting their business lag in profitability behind the other types of firms. On the other hand, not all additions of the Internet as distribution channel result in spectacular improvements in overall efficiency.

We believe that our paper makes a substantial contribution to the existing body of knowledge. This study empirically examines the link between the different levels of Internet usage for business and financial performance as measured by various performance indicators and comparing three different types of firms: (1) click-and brick, (2) brick-and-mortar, and (3) pure-click, with additional analysis of their synergistic combinations.

Certainly there were various reasons why many PC firms went out of business. To this end, our research also provides evidence that financial performance of PC firms was not the highest among the three different types of firm strategy. RBV offers possible explanations for this. Our empirical study indicated that the average financial performance of PC firms still lags behind other types of firm strategy. This is probably one of the possible reasons that some of PC firms are switching to CB firms. It also seems that the high dependency on one marketing tool, the Internet, makes PC firms extremely vulnerable.

In conclusion, this research examined the relationship between firm type and financial performance. The results of this empirical study provide future evidence that utilization of the Internet for business may substantially affect financial performance as estimated by various financial ratios. We believe that research linking firm strategies with financial performance is important and promising for future investigations.

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Appendix A.

List of Brick-and-Mortar, Brick-and-Click, and Pure-Click Firms in the Sample

Brick-and-Mortar Sample		Click-and-Mortar Sample		Pure Click Samples	
Company Name	Total Assets ($Million)	Company Name	Total Assets ($Million)	Company Name	Total Assets ($Million)
Interwoven Inc.	439.15	Electrorent Corp	305.39	Akamai Technologies Inc	421.48
Labranche & Co Inc.	2000.84	SWS Group Inc	3784.76	TD Ameritrade Holding Corp	3653.87
Michaels Stores Inc.	1414.63	Neighborcare	1834.58	Amazon.Com Inc	1637.55
Titan Corp	1460.40	Cinemark USA Inc	996.54	BEA Systems Inc	1659.95
Protection One Inc.	1748.48	Marcus	774.79	Checkfree Corp	2183.95
Wind River Systems Inc.	607.62	Orient-Express Hotels	836.25	CNET Networks Inc	814.78
Checkers	127.26	Cache Inc	57.14	1-800 Contacts Inc	50.41
Williams Scotsman Inc.	1244.98	Getty Images Inc	993.08	Citrix Systems Inc	1208.23
Centra software Inc.	70.98	Century Casinos Inc	44.82	Cybersource Corp	78.19
First Cash Financial Svcs.	122.81	Sharper Image Corp	162.34	Drugstore.Com Inc	171.30
Universal Compression Inc.	1276.78	Sybase Inc	1133.24	Ebay Inc	1678.53
Authentidate Holding Corp	25.87	Scientific Learning Corp	23.29	Ecollege.Com	27.24
Sungard Data Systems Inc	2898.16	Autodesk Inc	902.44	Earthlink Inc	1179.32
Pennichuck Corp	87.84	NTN Buzztime Inc	13.38	Eon Communications Corp	39.65
Rock of Ages Corp	153.79	Delta Apparel Inc	91.32	GSI Commerce Inc	190.77
Smith Micro Software Inc.	9.26	Skyline Multimedia Entertainment Inc	6.01	Mamma.Com Inc	7.14
Textron Financial Corp	6463.96	WFS Financial Inc	5490.76	Indymac Bancorp Inc	7497.31
Glacier Bancorp Inc	2085.75	Bank Mutual Corp	2905.79	Netbank Inc	2879.53
HearUSA Inc	21.34	Calloway's Nursery Inc	27.26	Overstok.Com Inc	21.71
World Fuel Services Corp	257.92	Domino's Inc	382.29	PC Connection Inc	244.24
Advent Software Inc	453.68	Hummingbird Ltd	349.90	Web.com Inc	429.28

Authors Bios and Photos

Myung Ko is an assistant professor of the Department of Information Systems and Technology Management at the University of Texas at San Antonio. She received her Ph. D. from Virginia Commonwealth University. Her research interests include impact of IT on organizations, data mining, computer security, and economics of security breach. Her work has been published in refereed journals such as Information & Management, Information Systems Journal, Information and Software Technology, Information Resources Management Journal, and Information Technology & Management.

Narcyz Roztocki is an Associate Professor of Management Information Systems at the State University of New York at New Paltz. His research interests include IS/IT investment evaluation, IS/IT productivity, IS/IT investments in emerging economies, technology project management, and e-commerce. He has published in numerous journals and conferences including: the Electronic Journal of Information Systems in Developing Countries, Electronic Journal of Information Systems Evaluation, International Journal of Service Technology and Management, Journal of Global Information Technology Management, Journal of Information Science & Technology, and proceedings of the AMCIS, DSI, ECIS, ECITE and HICSS.