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Information Technology and Financial Performance: The Impact of being an Internet-Dependent Firm on Stock Returns

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Abstract. *The choice of a particular technology to implement a firm's business strategy may impact the firm's market performance. This study assesses the impact of being an Internet-dependent firm on a firm's stock valuation. The empirical results indicate that in a booming economy, Internet-dependent firms have lower excess returns than non-Internet firms. These high returns can be explained by the fact that in such an economy, Internet stocks trade at relatively higher prices than non-Internet stocks. Therefore, choosing a particular technology to implement business strategy may have a significant impact a firm's stock performance.*

Key Words. *information technology, internet-dependent firms, financial performance, stock return*

Introduction

As we enter the new millennium, innovations and competitive pressures force organizations to rethink the manner in which they conduct business and to redefine the essential ingredients for success (Hoplin, 1995). The basis of competition is being fundamentally altered through the introduction of the Internet and other advanced technologies (Sampler, 1998). Information technology (IT) boosts the efficiency and effectiveness of the decision-making process (Molloy and Schwenk, 1995) and therefore, is perceived by executives in most firms as an integral part of their products, their customers, and their business strategy (Bartholomew, 1998). The realities of the electronic marketplace make Internet technology the most used form of IT (Ferguson, 1996). But the rapid growth of the Internet raises questions about how to evaluate its impact on a firm performance. Significant confusion exists among scholars and practitioners regarding Internet technology and e-commerce strategies (Gallagher, 1999).

Based on their understanding of macroeconomics, industrial structure issues and the role of technology in the economy, business economists are uniquely equipped to assess and help shape e-commerce strategies (DePrince and Ford, 1999). However, determining whether IT investment impacts firm performance has for long been a challenge for IS researchers and practitioners (Dos Santos, Peffers, and Mauer, 1993). In an attempt to define and assess information system success, most research in the field of Management Information Systems (MIS) had focused on information system quality, user satisfaction, and organizational impact (Delone and McLean, 1992). These areas do not

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always justify companies' decisions to invest in a given technology. Economist and IS researchers are becoming more and more interested in studies relating IT investment and firm performance (Im, Dow, and Grover, 2001). Over the past decade, studies have produced either not conclusive results (Tam, 1998), mixed results (Avison, Eardley, and Powell, 1998; Bleiweiss, 1998; Ranganathan and Samarah, 2001), or a positive and significant relationship between IT investment and firm financial performance (Capon, Farley, and Hulbert, 1994; Dos Santos, Peffers, and Mauer, 1993; Im, Dow, and Grover, 2001; Oh and Kim, 2001; Ranganathan and Samarah, 2001; Subramani and Walden, 1999, 2001).

The explosion of Internet technology and the behavior of investors and decision makers toward firms that use the Internet suggest that, contrary to Tam's (1998) findings, Internet technology must have an impact on firms' market performance; therefore, the Internet presents an ideal test case for studying the impact of IT investment on a firm's performance. The goal of this research is to assess how using a particular technology, such as Internet technology, can have a measurable impact on a firm's financial performance. By examining the effect of the Internet on stock abnormal returns, it may be possible to identify a linkage between Internet technology and market performance, thereby contributing to the existing literature by providing evidence for a linkage between IT investment and firm performance.

Information Technology and the Internet

Since the beginning of the "Second Industrial Revolution", the development of IT has made it possible for people to no longer be physically located near their workplace (Barnatt, 1995). Through new information technologies, companies can enter new market channels, possibly through the use of the Internet to create a virtual structure (Ferguson, 1996). Companies are compelled to go online for a number of reasons, including the growing demand from their clients for the convenience and freedom offered by the technology (Prete, 1997). Furthermore, with the rapid advances in Internet tools and capabilities and its low costs, companies that can move with the pace of the Internet seem to have a better chance of success than those that rely on the relatively slow pace of traditional/physical corporate planning (Lundquist, 1997). Hence, an increasing number of companies are trying to achieve a competitive advantage by using information technology to establish links among their employees, across functions, with customers, and to data (Haapaniemi, 1996).

The Internet is growing fast and changing the nature of modern commerce (Simons, 2001). With the explosion of Internet commerce, some firms depend entirely on Internet technology to engage in business transactions with customers and suppliers (Ashbaugh, Johnstone, and Warfield, 1999). They are Internet-dependent firms or firms that were created as a result of the Internet revolution and could not exist without the Internet. The success of Internet-dependent firms depends on the adaptability of their products and services to Internet operational characteristics (Amar, 1999).

In addition to general information technology expectations that feature quality supply (McRae, 1998) and cost reduction (Barnatt, 1995; Gallagher, 1999; McRae, 1998), Internet technology characteristics include building trust and improving communication quality (Gallagher, 1999). However, Internet firm performance measures have been very much based on proxies, which at some point have led their stock prices to be overvalued. The overvaluation of Internet stocks has been characterized by James (1999) as a disaster waiting to happen. Internet stock prices are very volatile (Gurley, 1998) and volatility was largely responsible for the 2000 market failure (Lardner and Sloan, 2000).

The proxies used include market capitalization per subscriber, market capitalization per unique visitor, and ratios involving webpage views and revenues (Gurley, 1998). Some Wall Street analysts used the life value of a customer, which is a valuation based upon hopes for future profits (Fortune, 1999). Other proxies are based on the revenue trends, earnings trends and company competitive position relative to other Internet firms (King, 2000). Most of these valuations methodologies cannot be justified by any calculation previously used in accounting (Fortune, 1999); they are not based on fundamentals (James, 1999). Keating (1997), analyzing factors affecting performance, examined the following performance metrics: price-earnings ratio, growth opportunity, manager's impact, firm size, and correlation between stock returns and market-wide returns.

Since the April 2000 market fall, the price-earnings ratio and other financial ratios have become important factors in valuing Internet stocks (Boitano, 2000) because stock prices should reflect future earnings (DePrince and Ford, 1999). Hence, as Gurley (1998) and King (2000) proposed, Internet stocks can be valued using the discounted cash flow method.

Pethokoukis and Vogelstein (2000) proposed that the price-earnings ratios and high dividend payout should be used to assess Internet stocks performance. Stock performance is among the most widely used indicators to measure a firm's performance.

Stock Performance Measures

Stock performance helps investors gauge how well their managers are handling their money. Several studies have proposed different proxies to assess stock performance. Armitage and Jog (1996), Clinton and Chen (1998), Ferguson and Leistikow (1998), Gapenski (1996), Lehn and Makhija (1996), Ochsner (1995), Rogerson (1997), and Stephens and Bartunek (1997) have used economic value as a measure of performance. The economic value added is obtained by comparing profits with the cost of capital involved in obtaining these profits (Stephens and Bartunek, 1997). The stock values of Internet firms bear very little relationship to classical business performance measures (Savitz, 1998) and most Internet firms are still not profitable which creates a need for better proxies. Sundaram, John, and Kose (1996) and Johnson and Pazderka (1993) have used the stock market performance, and Dos Santos, Peffers, and Mauer (1993), Elfakhani, Lockwood, and Zaher (1998), Fama and French (1993, 1995), Im, Dow, and Grover (2001), Loughran (1997), Oh and Kim (2001), Ranganathan and Samarah (2001), Subramani and Walden (1999, 2001), and Zaher (1997), have used the stock excess returns based on the Capital Asset Pricing Model (CAPM). The CAPM is the most widely used method to estimate the returns on stock. The abnormal returns (ARs) are estimates for those changes.

$$AR_{it} = R_{it} - \hat{R}_{it}$$

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$$\hat{R}_{it} = \hat{\alpha}_i + \hat{\beta}_i R_{mt} \quad (\hat{\alpha}_i \text{ and } \hat{\beta}_i \text{ are parameter estimates})$$

Where:

AR_{it}: Abnormal return of stock i at time t
R_{it}: Actual return of stock i at time t ($R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}}$ P_{it}: Price of stock i at time t)
$\hat{R}_{it}$: Predicted (estimated) return of stock i at time t
R_{mt}: Return on the market portfolio at time t
ε_{it}: Error term of stock i at time t

$$AR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} = \frac{1}{N}\sum_{i=1}^{N} \varepsilon_{it},$$

where N = the number of firms

$$CAR_{it} = \sum_{t=1}^{T} AR_{it} \quad \overline{CAR} = \frac{1}{N}\sum_{i=1}^{N}\sum_{t=t_1}^{t_2} AR_{it}$$

The hypothesis of no difference in excess returns, $\{AR_t = E(\varepsilon_{it} = 0)\}$, must be analyzed. To test the hypothesis that the CAR is different from zero, the student's t-test is set as:

$$t = \frac{\overline{CAR}_t}{\sqrt{\text{Var}(\overline{CAR}_t)}} \sim t(N-1)$$

The cumulative return of Internet firms is expected to be lower than that of standard firms because Internet companies have seen rapid stock price rises (Waters, 1998) and falls despite their having been established within the past few years. The cumulative abnormal return (excess return) is the proxy used in this study. Fama and French (1993) suggest that stock excess returns are affected by portfolio size and book-to-market ratio. In addition to the firm size and BE/ME, variables capturing the impact of technology are included to the model: they are the Internet variable, industry rank and age of the company. The hypothesis is that stock excess returns will vary with firm size, book-to-market value, Internet investment, rank of the industry in which the firm is categorized and age of the company. This hypothesis is represented in Fig. 1.

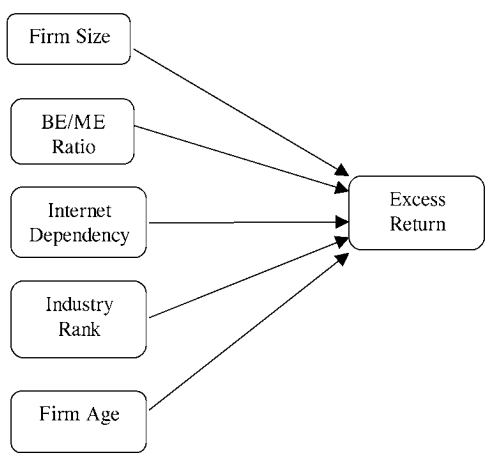

Fig. 1. *Conceptual model of variables that affect firm stock return.*

Firm size. This variable can be measured in more than one-way: the number of employees (Palvia and Palvia, 1999), total assets (Im, Dow, and Grover, 2001) and sales (Fombrun and Shanley (1990) and Stanwick and Stanwick (1998)). The number of employees and the total assets may not be good proxies for this study given the virtual nature of Internet firms, which have relatively less office space and fewer employees than standard firms and whose assets, such as computer equipments and software, tend to depreciate faster (Kamssu and Reithel, 2002). Therefore, an appropriate proxy for firm size is the annual sales.

Proposition 1. *Fama and French* (1993, 1995), *Elfakhani, Lockwood, and Zaher* (1998), *Im, Dow, and Grover* (2001), *Loughran* (1997), *and Zaher* (1997) *report that large firms tend to have lower abnormal returns. Their rationale is that size is related to profitability. The stocks of small firms usually have lower earnings on book equity than stocks of big firms. So investors will find small firms' stocks more attractive than that of large firms only if they believe that small firms' stocks are under-priced. Therefore, it can be presumed that there will be a negative relationship between firm size and stock excess return because those small firms perform better than expected leading to higher excess returns.*

Book-to-market ratio. The book-to-market equity is a market-based ratio reflecting how outsiders feel about a company. A low book-to-market equity implies a high stock price relative to the book value.

Proposition 2. *High BE/ME (low stock price relative to book value) signals low earnings on book equity and therefore less profitability. Fama and French* (1993, 1995), *Elfakhani, Lockwood, and Zaher* (1998), *Loughran* (1997), *and Zaher* (1997) *found a positive relationship between book-to-market equity and stock abnormal return. Therefore, a positive relationship can be expected between book-to-market equity and excess return.*

Internet. A firm's decision to invest in Internet technologies must have an impact on stock excess returns. Internet stocks are not trading on fundamentals (James, 1999). Their valuation is based upon hopes for future profits and cannot be justified by calculations previously used in accounting (Fortune, 1999).

Proposition 3. *Since the stock price is the discounted value of expected future earnings* (*Gurley*, 1998; *King*, 2000) *in a booming economy, Internet firms will have lower excess returns due to the fact that the high prices of stocks may have made it difficult for those stocks to yield a sufficient return to investors* (*Waters*, 1998). *Therefore, the excess return is likely to be negative in the period of Internet firms' prosperity.*

Industry growth opportunity. A firm's growth opportunity is a determinant of future firm performance. However, it is difficult to find a perfect measure of growth opportunity (Gaver and Gaver, 1995). The proxies previously used include the market-to-book value of assets (Bizjak, Brickley, and Cole, 1993; Smith and Watts, 1992; Chung and Charoenwong, 1991), the level of research intensity (Bizjak, Brickley, and Cole, 1993) and the revenue or return variability equity (Chung and Charoenwong, 1991; Smith and Watts, 1992). Overall, industry performance can also be used as an indicator of growth opportunity (Smith and Watts, 1992). Differences exist in social and financial performance among different industries (Waddock and Graves, 1997). Lewis, Rogalski, and Seward (1997) found that investors could achieve a significantly higher return using Value Line common stock ranking. The industry rank is used in the present study.

Proposition 4. *Smith and Watts* (1992) *argue that high-growth firms are usually riskier and should yield higher returns than low-growth firms in order to compensate for risk. In addition, Lewis, Rogalski, and Seward* (1997) *found that investors could achieve a significantly higher return using stock ranking. Therefore, high-growth stocks can be expected to have higher excess returns. In other words, the better the industry rank the higher the excess return. This leads to a negative relationship between industry rank and abnormal return. Therefore, the slope of the industry variable is expected to be negative.*

Firm age. Like firm size, the age of a firm may affect its returns. Therefore, the age of firms should be taken in to consideration to control for the effect of the immaturity of Internet firms in investment decision and stock excess returns.

Proposition 5. *Older firms can be viewed as less risky than newly created firms. The rationale is that investors would have the tendency of trusting firms that have been around longer because they have more historical data*

to predict their profitability. Hence, older firms would likely have higher actual returns and, therefore, higher excess returns.

Research Design

As initiated by Ashbaugh, Johnstone, and Warfield (1999) and represented in Fig. 2, the present study divided companies in two groups, based on their dependency on the Internet: Internet-dependent firms and traditional firms. *Internet-dependent firms* are firms that were created as a result of the explosion of the Internet. These firms use the Internet for most of their transactions. *Traditional firms (non-internet firms)* are firms that do not need the Internet for their transactions. However, today, most firms have become hybrid of both types; they are *mixed firms*.

A list of 140 publicly traded companies involved solely in Internet-related businesses was collected. The study considers only companies that, not only went public before December 1998, but also, whose stocks did not undergo changes such as stock splits before December 2000. The firms must also have their data reported in Compustat, Compact Disclosure, and Value Line. Therefore, the sample size was reduced to 53 firms. The data set includes 53 Internet-dependent firms and 53 control firms. The control firms were publicly traded traditional firms in the same industry as the Internet-dependent firms and with approximately the same level of activity. Proxies for industry type and level of activity are the primary SIC-code and the sales respectively. Some models include stock market capitalization (used as a proxy for firm size), market-to-book ratio, the stock excess return for 1998 and 2000, and industry rank and firm's age. Therefore, the present study added the Internet, Industry growth opportunity, and firm's age variables to the model developed by Fama and French (1993). The statistical model used for the analysis is an ordinary least squares regression model.

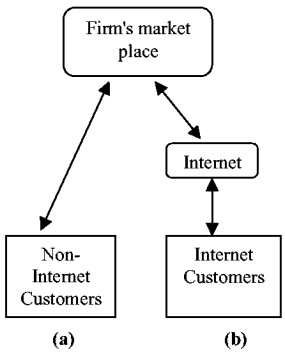

Fig. 2. *(a) Traditional firms, (b) Internet firms.*

Empirical Results

Tables 1 and 2 report the results of ordinary least squares regression model in which the dependent variable is stock excess return for the year 1998 and 2000 respectively.

(1) The Internet variable is negative ($\beta = -4.101051$ for 1998, and $\beta = -0.346749$ for 2000) and significant at the 95 percent level in 1998 and 52 percent in 2000 ($t = -1.98638$ and $t = -0.722896$ respectively). The negative and significant value indicates that Internet stocks exhibited lower excess returns than standard firms in 1998 because actual returns on those stocks could not meet expectations. These high expectations might be tied to the fact that these Internet firms were created when

Table 1. *Ordinary least squares estimates of excess return for 53 internet-dependent firms and 53 non-internet firms in 1998*

	Parameter estimated	*t*-statistic	*P*-value
Internet	−4.101051***	−1.986380***	0.049756
Firm size	−0.000076	−0.097793	0.922294
BE/ME	−0.091444	−0.039119	0.968874
Industry rank	−0.0049856	−0.066825	0.9468556
Firm age	0.0152239	0.217660	0.828142
F-ratio	1.214977		0.3077634
R-squared	0.240447		

*Statistically significant at 70% confidence level.
**Statistically significant at 80% confidence level.
***Statistically significant at 90% confidence level.

Table 2. *Ordinary least squares estimates of excess return for 53 internet-dependent firms and 53 non-internet firms in 2000*

	Parameter estimated	*t*-statistic	*P*-value
Internet	−0.346749	−0.722896	0.471776
Firm size	−0.0002558**	−1.417327**	0.160131
BE/ME	0.037761	0.526632	0.599854
Industry rank	−0.005005	−0.272723	0.785743
Firm age	0.008426	0.456298	0.649368
F-ratio	0.680093		0.639748
R-squared	0.198386		

*Statistically significant at 70% confidence level.
**Statistically significant at 80% confidence level.
***Statistically significant at 90% confidence level.

the stock market was experiencing a bull market for technology stocks. In periods of recession, Internet firms are likely to perform worse than non-Internet firms. This suggestion is consistent with the returns on Internet stock observed after the 2000 market failure.

The Internet variable appears to be the only variable significant in 1998. It is also the only variable for which the significance level deteriorates in the year 2000, implying that in 1998, market investment decisions were biased toward Internet firms' stocks. Many investors based their investment decision not on the fundamentals, but on hopes for future returns. However, after the April 2000 market crash, investors' predictions of future returns seem to have been made with more reservation; therefore, Internet stocks expected returns and actual returns are closer, resulting in the reduction of the magnitude of the excess returns.

(2) As predicted in Proposition 1, the parameter estimates for firm size is negative ($\beta = -0.000076$ for 1998, and $\beta = -0.0002558$ for 2000) which is consistent with the Fama and French (1993, 1995) results. Therefore, small firms tend to have higher excess returns on their stocks because the firms are riskier and were originally valued relatively lower than large firms' stocks. This variable is significant at less than the 8 percent level ($t = -0.097793$) in 1998 but the level of significance increases to more than 83 percent in 2000. The low level of significance in 1998 can be explained by the fact that Internet firms are likely to be smaller than traditional firms, which also contributes to the negative relationship between firm size and excess return.

(3) The book equity to market equity gives mixed results. The parameter for BE/ME is negative ($\beta = -0.091444$) but not significant ($t = -0.039119$) for 1998. For the year 2000 it becomes positive ($\beta = 0.037761$) and the level of significance improves from 3 percent to 40 percent. The negative sign derives from the fact that in the 1998 bull market, most Internet stocks were overpriced and volatile as noted by Gurley (1998), James (1999), and Lardner and Sloan (2000). Stocks were trading at prices (ME) higher than their actual worth (BE), which led to lower excess returns. Hence, there was an adjustment of stock prices, which generated larger excess returns in 2000. Therefore, the coefficient for BE/ME becomes positive and the significance level improves.

(4) As suggested in Proposition 3, the industry rank is negatively related to abnormal returns ($\beta = -0.0049856$ for 1998, and $\beta = -0.005005$ for 2000). The coefficient of industry rank remains unchanged from 1998 to 2000 and not significant even though the significance level increases from 5 percent in 1998 to 21 percent in 2000. This indicates that, in the year 2000, investors may have considered the industry rank (or others criteria linked to the industry rank) when investing in stocks more than they did in 1998. The results suggest that firms performing in highly growing industries are more attractive to investors and, therefore, the actual return on their stocks is higher than expected, leading to higher excess returns.

(5) As predicted in Proposition 5, the firm's age is positively related to excess return in both periods ($\beta = 0.0152239$ for 1998, and $\beta = 0.008426$ for 2000). This variable is not significant for either period ($t = 0.21766$ in 1998 and $t = 0.456298$ in 2000). This means that it cannot be said with certainty that the age of a firm will affect outsiders' perception of its stocks. However, there is an increase in the level of significance, which suggests that more and more, investors tend to favor older firms. This may simply be due to the fact that they choose stocks after studying their historical performance (5 to 10 years or more) and, since most Internet firms are fairly new, they do not offer such information.

The overall model explains the changes in excess returns better in 1998 than 2000 ($F = 1.214977$, $R^2 = 24.0447\%$ in 1998; and $F = 0.680093$, $R^2 = 19.8386\%$ in 2000). This implies that in the 1998 bull market, the stock returns were mainly driven by dependency on the Internet. But in 2000, the recession caused investors to rely on other criteria (some of which are not featured in the present study) to assess the value of stocks. This low R-squared is consistent with those generated by the Fama and French (1993) model, which ranged between 7 and 29 percent.

Summary and Conclusion

This study has attempted to provide empirical evidence to establish a link between dependency on the Internet and firm performance. The basic hypothesis of the study is that Internet firms' stocks will perform better in a technologically driven booming economy than

non-Internet firms' stocks. This suggests that, in a booming economy, such as the period for which the sample was collected, the price of Internet stocks has risen faster than that of standard stocks. Therefore, Internet firms will have lower excess returns on their stocks.

Dependency on the Internet appears to be negatively related to the stock excess return and is the only significant variable in 1998. In 2000, however, the firm size is the most significant variable. The level of significance decreases for the Internet variable and increases for all other variables which can be explained by the reaction of investors toward Internet firms. Before the April 2000 market failure, the valuation of Internet companies' stocks was heavily based on proxies not supported by accounting fundamentals. Decisions to invest in stocks were driven by dependency on the Internet more than other parameters. Therefore, the Internet variable was the only variable significant in 1998. After the market crash, investors began to base their stock selection on traditional methods of assessing firm. This new selection method led to a decrease in the significance level of the Internet variable and an increase in the significance level of all other variables. The firm size became the most significant variable.

This study takes advantage of the unique window of opportunity offered by the time of transition between purely traditional economy and Internet-based economy and offers a perspective on the apparent impact of technology investment decisions on firm financial performance. However, there are some limitations that must be addressed. The first limitation comes from the use of binary variables to represent the Internet variable. This binary representation does not allow one to distinguish mixed firms. In practice, there is a crossover between firms. Some firms start as Internet-dependent and later use of the means to market their products and services. In addition, traditional firms are using the Internet to remain competitive. This crossover makes it difficult to find purely Internet-dependent firms or purely traditional firms. Another limitation is that Internet firms are very young compared to non-internet firms, which may bias the results.

Given its purpose and limitations, there are issues that can be addressed in future research. For instance, it may be useful to use percentage to represent the level of dependency on the Internet and compare the results. In that case, dependency on the Internet could be calculated by dividing the amount of sales made via the Internet by the firm's total sales. This suggestion does not exhaust the areas of opportunity, but it presents a possibility for new research that will hopefully be conducted in the near future.

Appendix: List of the 53 Internet-Dependent Firms

Internet company name	Ticker	Year created	Industry name
Amazon.com	AMZN	1994	Internet
America Online	AOL	1985	Internet
At Home Corp	ATHM	1995	Computer Software & Svcs
Autobytel.com	ABTL	1995	Auto Buying services
AutoWeb.com	AWEB	1995	Auto Buying Services
Beyond.Com Corp	BYND	1994	Internet
Broadcom Corp	BRCM	1991	Telecom. Services
BroadVision Inc	BVSN	1993	Computer Software & Svcs
Checkpoint Systems	CKP	1969	Precision Instrument
Cisco Systems	CSCO	1984	Computer & Peripherals
CNET Inc.	CENT	1992	Internet
Concentric Network	CNCX	1991	Computer Software & Svcs
Cyberian Outpost	COOL	1995	Consumer Goods
CyberShop Intl Inc	CYSP	1997	Internet
Cylink Corp	CYLK	1984	Computer Software & Svcs
DoubleClick Inc	DCLK	1996	Internet
E*Trade Group	EGRP	1982	Internet
EarthLink Network	ELNK	1994	Internet
eBay Inc.	EBAY	1995	Internet

(*Continued on next page.*)

(*Continued*).

Internet company name	Ticker	Year created	Industry name
Egghead.com	EGGS	1994	Retail (Special Lines)
EToys	ETYS	1997	Toys
Excite Inc.	XCIT	1994	Internet
Exodus Communications	EXDS	1992	Internet
Fine.com Corp	FDOT	1994	Computer Software & Svcs
FVC Com Inc	FVCX	1993	Computer Software & Svcs
Homecom Communications	HCOM	1994	Computer Software & Svcs
Homestore.Com	HOMS	1996	Real Estate Services
IDT Corp.	IDTC	1980	Telecom. Services
Infoseek Corp.	SEEK	1993	Internet
ISS Group Inc	ISSX	1994	Computer Software & Svcs
Lycos Inc.	LCOS	1995	Internet
MindSpring Enterpr.	MSPG	1994	Internet
Mortgage.com	MDCM	1993	Financial Services
Multex.Com	MLTX	1993	Financial Services
NetSpeak Corp	NSPK	1995	Computer Software & Svcs
Network Assoc.	NETA	1989	Computer Software & Svcs
Open Market Inc	OMKT	1994	Internet
Peapod Inc	PPOD	1989	Internet
Priceline.com	PCLN	1997	Consumer Goods
Prodigy	PRGY	1996	Internet Services
PSINet Inc	PSIX	1989	Internet
RealNetworks Inc	RNWK	1995	Computer Software & Svcs
Rogue Wave Software	RWAV	1989	Computer Software & Svcs
Security Dynamics Tech	SDTI	1984	Computer Software & Svcs
SportsLine USA	SPLN	1994	Internet
Ticketmaster Online	TMCS	1995	Internet
uBID Inc.	UBID	1997	Internet
Verisign Inc	VRSN	1996	Computer Software & Svcs
Visual Data Corp	VDAT	1993	Advertising
V-One Corp	VONE	1993	Computer Software & Svcs
Voxware Inc	VOXW	1993	Computer Software & Svcs
White Pine Software	WPNE	1992	Computer Software & Svcs
Yahoo! Inc.	YHOO	1994	Internet

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