The Eyeballs Have It: Searching for the Value in Internet Stocks

Brett Trueman; M. H. Franco Wong; Xiao-Jun Zhang

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BRETT TRUEMAN, M. H. FRANCO WONG,
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ABSTRACT

In this paper we provide insights into the manner in which (relatively sparse) ac-
counting information, along with measures of Internet usage, is employed by the
market in the valuation of Internet firms. We do not find a significant association
between bottom-line net income and our sample firms' market prices, consistent
with the claim made by some investors that financial statement information is of very
limited use in the valuation of Internet stocks. However, when we decompose net in-
come into its components, we find that gross profits are positively and significantly
associated with prices. In addition, we find that in most instances both unique visi-
tors and pageviews, as measures of Internet usage, provide incremental explanatory

137

power for stock prices, over and above net income and its components. We also sep-
arately analyze the e-tailers and the portal and content/community firms in our
sample and find significant valuation differences with respect to both their financial
data and the measures of Internet usage.

[KEYWORDS: Internet stocks; valuation; financial information; nonfinancial infor-
mation; web traffic; pageviews; unique visitors.]

1. Introduction

In this paper we provide insights into the valuation of Internet stocks
by examining the extent to which their market values are associated with
fundamental accounting information and by exploring the role played by
Internet usage data in explaining the firms' stock prices. This study is mo-
tivated by the high prices at which many of these stocks trade relative to
their operating performance. For example, as of April 11, 2000, Yahoo!
had a *P/E* of 580, eBay a *P/E* of 1,945, and Amazon.com traded at a mul-
tiple to *revenue* of 13.5 (it has been unprofitable since inception) with a
market cap of $22.2 billion. Many new (and sometimes unique) valuation
measures have been suggested, such as market value per eyeball or ac-
quisition cost per user, to justify the high prices that investors are paying
for Internet shares.[1]

Just how hard it is to reconcile the value of these companies with
fundamentals is reflected in a recent analyst research report on Ama-
zon.com. At a time when the stock was trading for $130 a share, the an-
alyst issued a buy recommendation, even though his official projections
led him to a valuation of only $30. Admitting that he could justify any
valuation between $1 and $200 by varying his assumptions, the analyst
stated that his recommendation was based on the opportunity, the com-
pany, and its management—all somewhat amorphous concepts.

Internet stocks are difficult to value for at least two reasons. First, the
industry and the firms in it are so young that there is very little historical
financial information available with which to forecast future profitability.
(Most of the firms have never reported a quarterly profit and are not
expected to do so for some time.) Second, the industry is evolving at
such a rapid, and unpredictable, pace that whatever historical informa-
tion exists is likely to be less useful for valuing these firms than for valu-
ing those in more established industries, or even those in non-Internet
high-tech industries.

These difficulties notwithstanding, the Internet industry offers an
important advantage to the researcher—the availability of a substantial
amount of nonfinancial data on Internet usage, which investors can em-
ploy in the prediction of future revenues. We expect that current traffic
at an Internet firm's web site(s) will be positively related to future reve-
nues, since it reflects potential future demand for the company's prod-
ucts and, at least indirectly, affects the rates the firm can charge for

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[1] See, for example, "How Much Are Your Eyeballs Worth?" (*Fortune* [February 21, 2000],
pp. 197–204).

advertising on its web site(s).[2] These data come directly from the Internet companies, as well as from independent rating firms (such as Media Metrix, PC Data, and Nielsen/Netratings), and include statistics on web site pageviews and visitors. The availability of these data provide an opportunity to explore how investors supplement relatively sparse financial information with nonfinancial data in the valuation process.

We focus on a subset of the Internet stock universe—the portals (those providing a gateway to the Internet), the content/community providers (those catering to certain segments of the population or to groups of people with specific interests), and the e-tailers (who sell goods and services on the Internet). These firms share a common characteristic—their primary business involves direct contact with users on the web. They are arguably among the best-known Internet firms and include the four largest Internet companies—America Online, Yahoo!, eBay, and Amazon.com. We excluded other types of Internet firms, such as those providing security or those solely offering Internet access, from our study because they are of a distinctly different nature from those which we have chosen to include. Our final sample consists of 63 publicly traded Internet firms spanning 217 firm-quarters. For each firm-quarter we collected detailed financial statement information and were provided with measures of Internet usage by Media Metrix.

Consistent with the claim made by some investors that financial statement information is of very limited use in the valuation of Internet firms,[3] we find no significant association between bottom-line net income and our sample firms' stock prices. However, when we decompose net income into its various components (to allow for the possibility that the individual line items have different implications for future firm profitability), we find a positive and significant association between gross profits (revenues minus cost of revenues) and prices. This result is consistent with the observation that Internet firms' bottom lines often include large transitory items (such as merger-related costs), on which investors likely place less weight in valuation, as well as items that might be considered to be investments rather than expenses in some firms (such as sales and marketing expenses or research and development costs). Gross profits, in

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[2] The link between web traffic and revenues is consistent with the popular notion that attracting visitors and establishing a brand name are very important determinants of an Internet firm's success. In a recent *Wall Street Journal* article ("Finding the Needles" [November 22, 1999], p. R44), Ann Winblad, cofounder of Hummer Winblad Venture Partners, stated that "Internet companies need to attract customers early and fast. That means reaching a big audience and achieving stickiness—keeping visitors at your site once they come. Those two goals drive the Internet branding process." In another article in the same issue ("Buying the Buyers," p. R42), Bruce Mowery, vice president of marketing and business development for more.com stated that "[w]e'll invest what it takes to be competitive in building a large customer base and maintaining a large share of the market." Additionally, many Internet analysts incorporate some measure of web site usage into their forecasts of revenues for the firms they cover.

[3] See, for example, Dan Mitchell, "Do Profits Really Matter?" (*The Standard* [December 20, 1999]), at http://www.thestandard.com/article/display/0,1151,8221,00.html].

contrast, reflect a firm's current operating performance and are often considered more permanent in nature (both for Internet firms and for more traditional companies).

Turning to the nonfinancial data, we find that web site pageviews complement the accounting data by providing incremental explanatory power for stock prices over and above net income and its components. Data on unique visitors also have incremental explanatory power, but only when combined with bottom-line net income (rather than its components). Overall, these results suggest that Internet usage measures play a significant role in the valuation of Internet stocks.

While the goal of this paper is not to determine whether Internet stocks are over- or underpriced on an absolute basis, the significant positive association we find between market value and (1) gross profits, (2) unique visitors, and (3) pageviews, as one would reasonably expect, is consistent with investors pricing these stocks in a rational manner, *relative to each other.* Additional evidence supportive of this conclusion comes from supplemental tests which show that market value, expressed as a multiple of gross profits, is higher for young, fast-growing firms, as well as for firms that have established higher barriers to entry, consistent with rational stock pricing.

The results discussed thus far apply to our sample of firms *taken as a whole.* To obtain further insights into the pricing of Internet stocks, we divide our sample into two groups: the e-tailers, and the portal and content/community firms (together referred to as the *p/c* firms). These groups generate revenues in markedly different ways. The e-tailers produce revenues by attracting visitors to their web sites and selling products, while the *p/c* firms depend largely on advertising for their revenues. We expect that investors will use the available financial data differently for valuation, and that the relative importance of visitors and pageviews as measures of Internet usage will differ. For the e-tailers we find, in general, that bottom-line net income is not significantly associated with stock prices, consistent with our sample as a whole. In contrast, a positive and significant association exists for the *p/c* firms. In this respect, *p/c* firms' shares behave more like those of non-Internet companies. Furthermore, in each subsample, pageviews and unique visitors continue to have incremental explanatory power for stock prices, in general. Alongside the components of net income, though, the unique visitors measure loses its significant association with the e-tailers' stock prices. Pageviews, however, remain significant for these firms when included with the net income components, suggesting that pages viewed per visitor are an especially important metric for these firms.

While ours is the first paper to consider the role of nonfinancial data in the valuation of Internet stocks,[4] others have explored its role in other

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[4] Hand [2000*a*] analyzes the pricing of Internet stocks using financial data. More recent work by Demers and Lev [2000], Hand [2000*b*], and Rajgopal, Kotha, and Venkatachalam [2000] examines the valuation implications of web usage data.

contexts. For example, Amir and Lev [1996] examine the valuation implications of different types of nonfinancial information, in conjunction with the available financial data, in the wireless communications industry. Ittner and Larcker [1998] consider the relation between customer satisfaction measures and both accounting numbers and market values, and examine the ability of these measures to predict revenues. The usefulness of patent citations for predicting future market-to-book ratios and stock returns for high-tech firms is explored by Deng, Lev, and Narin [1999], while Chandra, Procassini, and Waymire [1999] examine price reactions to the announcement of the book-to-bill ratio within the semiconductor industry.

2. The Empirical Model

2.1 LINKING INTERNET STOCK PRICES TO FUNDAMENTAL INFORMATION

As a foundation for our empirical tests, we relate an Internet firm's stock price to its underlying financial and nonfinancial data. We begin with the well-known residual income model (see Ohlson [1995]):

$$MV_t = BV_t + \sum_{i=1}^{\bullet} \frac{E(RE_{t+i})}{(1+r)^i} \tag{1}$$

where MV_t is the firm's market value at the end of the current period t, BV_t is the book value of its common equity at that time, RE_{t+i} is its residual earnings for period $t+i$ (defined as the period's earnings available to common shareholders less a charge applied to beginning-of-period book value), r is the firm's required rate of return on its equity capital, and $E(\cdot)$ is the expectation operator.

Decomposing the firm's period $t + i$ earnings into its components yields:

$$E_{t+i} = GP_{t+i} - OX_{t+i} - NX_{t+i} \tag{2}$$

where GP_{t+i} is the firm's gross profits (revenues minus cost of revenues) for the period, OX_{t+i} its operating expenses (principally sales and marketing costs, research and development, and general and administrative expenses), and NX_{t+i} its nonoperating expenses.

Next, we tie investors' expectation for each of the components of earnings to the currently available accounting information and Internet usage data, through two primary assumptions. We first assume that future gross profits are positively (and linearly) related to the current period's gross profits, operating expenses, and web site usage. We expect operating expenses to have a positive relation to future gross profits, because they represent, in part, an investment by the firm designed to increase future revenues. We conjecture that current-period web site usage is positively related to next period's gross profits because it (1) affects the future rates the firm will be able to charge for advertising on its web sites,

(2) may indicate future demand for the company's products and services, and (3) is correlated with next period's web site usage (which determines the amount of advertising revenues the firm will book that period and also reflects, in part, contemporaneous demand for the company's products and services).[5] We also assume that future expected operating expenses are (linearly) related to current operating expenses and that future nonoperating expenses (aside from net interest expense) are expected to be zero.

These assumptions, in conjunction with expressions (1) and (2), yield the following relation:

$$MV_t = a_0 + a_1 BV_t + a_2 GP_t + a_3 OX_t + a_4 USAGE_t. \tag{3}$$

We expect the signs of a_2 and a_4 to be positive, but we cannot predict the signs of the remaining coefficients.[6] The magnitudes of the coefficients in expression (3) are likely to vary over time, as each of our Internet firms evolves and matures. Consequently, it does *not* follow that the change in a firm's stock price over time is linearly related to the change in the right-hand-side variables in (3).

2.2 THE REGRESSION EQUATIONS

We first run the following simple regression:

$$\frac{MV_{jt}}{BV_{jt}} = \alpha_0 \frac{1}{BV_{jt}} + \alpha_1 + \alpha_2 \frac{NTINC_{jt}}{BV_{jt}} + \varepsilon_{jt} \tag{4}$$

where MV_{jt} = firm j's market value at the time of its quarter t earnings announcement, BV_{jt} = firm j's book value of common equity at the end of quarter t, and $NTINC_{jt}$ = net income available to firm j's common shareholders in quarter t.

Expression (4) strictly follows from (3) only under restrictive conditions on the growth rates of the various income statement line items, and under the assumption that financial data alone is sufficient for valuation purposes. Nevertheless, we run this regression in order to directly address the often-heard assertion that net income plays only a small role, at best, in the valuation of Internet stocks.

We next decompose net income into its components and run the following regression:

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[5] See Trueman, Wong, and Zhang [2000] for a detailed analysis of the link between web usage and revenues of Internet firms.

[6] From a theoretical perspective, Penman [1998] shows that the sign of the coefficient on book value, a_1, should be positive. Empirically, though, he finds it to be negative in some cases. Zhang [2000] argues that a negative coefficient is consistent with conservative accounting. That a_3 can be of either sign follows from the fact that operating expenses enter expression (2) negatively, while at the same time they are assumed to have a positive impact on future gross profits.

$$\frac{MV_{jt}}{BV_{jt}} = \alpha_0 \frac{1}{BV_{jt}} + \alpha_1 + \alpha_2 \frac{GP_{jt}}{BV_{jt}} + \alpha_3 \frac{MKTG_{jt}}{BV_{jt}}$$

$$+ \alpha_4 \frac{RND_{jt}}{BV_{jt}} + \alpha_5 \frac{OTHEXP_{jt}}{BV_{jt}} + \varepsilon_{jt} \tag{5}$$

where GP_{jt} = firm j's gross profits (revenues minus cost of revenues) for quarter t; $MKTG_{jt}$ = firm j's sales and marketing expenses for quarter t; RND_{jt} = firm j's research and development expenses for quarter t (which includes the amortization of web site development and enhancement costs, internal-use software development costs, and expenditures directed at developing transactions processing systems, but excludes the expensing of any acquired in-process research and development costs), and $OTHEXP_{jt}$ = firm j's other operating expenses for quarter t (including general and administrative, some depreciation and amortization, and merger-related costs).

This regression corresponds to expression (3) (scaled by book value), with Internet usage data suppressed as an explanatory variable and with operating expenses broken down into sales and marketing, research and development, and other operating expenses. By decomposing net income into its components we allow for the possibility that the various income statement line items have different implications for future profits. These differences could result from variations in growth rates across individual line items and the possibility that investors consider some expenses to be investments in the company's future. This decomposition is particularly important for Internet firms that are growing rapidly and spending significant amounts of money to ensure the continuation of this growth.[7]

We then augment regressions (4) and (5) by including a measure of Internet usage, $USAGE_{jt}$, as an additional independent variable, along with the financial data. This yields:

$$\frac{MV_{jt}}{BV_{jt}} = \alpha_0 \frac{1}{BV_{jt}} + \alpha_1 + \alpha_2 \frac{NTINC_{jt}}{BV_{jt}} + \beta \frac{USAGE_{jt}}{BV_{jt}} + \varepsilon_{jt} \tag{4'}$$

and:

$$\frac{MV_{jt}}{BV_{jt}} = \alpha_0 \frac{1}{BV_{jt}} + \alpha_1 + \alpha_2 \frac{GP_{jt}}{BV_{jt}} + \alpha_3 \frac{MKTG_{jt}}{BV_{jt}}$$

$$+ \alpha_4 \frac{RND_{jt}}{BV_{jt}} + \alpha_5 \frac{OTHEXP_{jt}}{BV_{jt}} + \beta \frac{USAGE_{jt}}{BV_{jt}} + \varepsilon_{jt}. \tag{5'}$$

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[7] This decomposition is likely to prove important in understanding how investors value firms in other industries as well. See Lipe [1986].

In running (4′) and (5′) we measure Internet usage alternatively by the number of unique visitors to the firm's web site(s) and by the number of pageviews at its site(s). Based on our previous discussion, we expect the signs of α_2 and β to be positive, with the other coefficients of ambiguous sign.

3. The Data and Descriptive Statistics

3.1 SAMPLE SELECTION CRITERIA

Our initial sample consists of all those firms appearing on the InternetStockList (compiled by internet.com) as of January 31, 2000. According to internet.com, the InternetStockList is "[a] comprehensive list of the more than one hundred publicly-traded companies involved solely in Internet-related business." To this list we add Netscape, geocities, broadcast.com, Excite, Onsale, and Xoom.com, which were acquired by other firms prior to this time. From this sample we retain only those firms that we judge to be primarily portals or content/community providers (collectively referred to as the *p/c* firms below), or e-tailers.[8] This leaves us with 95 firms and 335 firm-quarters. We then delete those firm-quarters for which either the firm's earnings announcement does not disclose all of the individual income statement line items required for our analysis, or for which the firm's common equity book value is negative.[9] After this screen, 68 firms remain, spanning 243 firm-quarters. Lastly, we eliminate those firm-quarters for which Media Metrix does not supply Internet usage data (as described below). The final sample consists of 63 firms and 217 firm-quarters of earnings announcements. Appendix A lists these firms.

3.2 FINANCIAL INFORMATION

We take the financial statement information in our study directly from the quarterly earnings announcement press releases (appearing on either *PR Newswire* or *Business Wire*) for each of our firms, starting from the time of its initial public offering. From each announcement we extract the following information: (1) revenues, (2) cost of revenues, (3) sales and marketing expenses, (4) research and development costs, (5) total operating expenses other than cost of revenues, (6) net income, and (7) end-of-quarter book value.[10]

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[8] To classify firms, we rely primarily on the self-descriptions contained in their earnings announcements.

[9] We require book value to be positive since we deflate by it in our regressions. Only eight firm-quarters are deleted due to this requirement.

[10] In a few cases firms report earnings for the quarter ending just prior to its initial public offering. In that case the firm's end-of-quarter book value does not include the proceeds of the offering. For each such quarter we restate the book value on a pro forma basis to reflect the offering proceeds. We set end-of-quarter book value equal to the book value at the end of the succeeding quarter (after the firm's share offering) minus the earnings for the quarter.

We obtain our financial data via this route, rather than retrieve it from *Compustat,* because we want our data set to consist solely of information known to investors at the time of the earnings announcement. *Compustat*'s data may differ from those available to investors at the earnings release date because (1) its data are obtained from companies' 10-Q filings, which may include more detailed information than what is available in the original press release and (2) *Compustat* restates historical financial information whenever the firms themselves issue restated numbers.

We compute the total market value of equity (the undeflated dependent variable) at the time of each earnings announcement by multiplying the firm's closing price per share on the trading day subsequent to the earnings announcement by the number of shares outstanding at that time.[11] We use the time of the earnings announcement to measure market value, rather than the end of the quarter, to ensure that the stock price incorporates the earnings information released.

3.3 NONFINANCIAL INFORMATION: INTERNET USAGE DATA

There are two potential sources for web site usage data—the Internet companies themselves and independent measurement firms. It might be expected that the Internet companies would be the superior source for usage data on their own web sites. Unfortunately, not all companies provide such data each quarter. Even those that give this information do not necessarily define their usage measures in the same manner, making intercompany comparisons problematic. (For example, one firm might count the same page viewed twice by a given user in a single day as two pageviews, while another might count it as only one. Or, one firm might count as two users a single person who logs onto its web site twice in a given time period, while another firm might count that user only once.) Using an independent measurement firm as the data source, on the other hand, avoids these problems by providing a time series of usage data that is consistently defined across Internet companies.

We obtain web usage data from Media Metrix, which has the longest time series of data of any independent Internet rating firm and which is described in a recent *Wall Street Journal* article as the most widely used web rating company.[12] Their services are utilized by more than 600 clients, including financial services companies, advertising agencies, and e-commerce marketers. Media Metrix provided us with their monthly *Web Report* for all months from October 1998 until December 1999.[13]

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[11] Since we are unable to determine the exact number of common shares outstanding on the day following the earnings announcement, we use as an approximation the number of outstanding shares listed on the face of the firm's 10-Q. This number is reported as of a date that is usually within a few weeks of the earnings announcement.

[12] See Nick Wingfield, "The Tricky Task of Tracking Web Users," *Wall Street Journal* (November 22, 1999), p. C1.

[13] An official at Media Metrix told us that the web usage data for months prior to October 1998 are not strictly comparable to those for the post-October period due to the company's merger with RelevantKnowledge, another web rating firm, around that time.

This report provides a number of different metrics for all reportable web sites that have a projected reach of 0.4% or higher.[14] It is normally released to clients (who pay a fee to obtain access to the report) approximately three weeks after the end of the month. The company also issues a press release each month listing the number of unique visitors to the top 50 web sites during the previous month. This information, however, is a very small subset of that contained in the monthly *Web Report*.

Media Metrix generates its raw data from a random panel of 50,000 Internet users who are willing to install tracking software on their computers at home and/or at work. These data are retrieved either in real-time via the web (for one-third of its panel members) or on a monthly basis by mail via disk (for two-thirds of the panel). The monthly web usage figures are extrapolated from the sample data based on the firm's estimate of the total number of web users. The other major web rating firms use similar sampling techniques to compute their Internet usage numbers.

We focus on two measures of Internet usage, "unique visitors" and "pageviews," which are among the most often cited measures in the popular press. For a given firm, unique visitors is the estimated number of different individuals who visit the firm's web site(s) during a particular month. We take the numbers for unique visitors directly from Media Metrix's monthly *Web Report*. Pageviews are the estimated number of pages viewed by those individuals visiting the firm's web site(s) during the month. Because this number is not directly reported by Media Metrix (there is no universally agreed-upon definition of this measure), we estimate it by multiplying together three measures that they provide: (1) the number of unique visitors, (2) the average usage days per visitor in a month, and (3) the average daily unique pages viewed per visitor in a month.[15]

For each firm-quarter ending October 1998 or later, we pair our financial data with the nonfinancial data in Media Metrix's report of the same month.[16] For the firm-quarters ending in September 1998 we use the

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[14] Media Metrix defines *reach* as the "percentage of projected individuals . . . that accessed the web content of a specific site or category among the total number of projected individuals using the web during the month."

[15] Media Metrix gives the precise definition of *unique visitors* as "[t]he estimated number of different individuals within a designated demographic or market break category that accessed the Web content of a specific site or category among the total number of projected individuals using the web during the month." *Average usage days per visitor* is defined by them as "[t]he average number of different days in the month, per person, in which a site or category was visited." *Average (daily) unique pages per visitor in a month* is defined as "the average number of different page requests made per day over the course of the month by those persons visiting the specific site or category."

[16] For some firm-quarters the *Web Report* comes out after the earnings announcement date. In these cases, the firm's stock price at that date might not fully reflect the non-financial data. This reduces the power of our tests but does not introduce any bias. This problem is minimized to the extent that investors have access to Media Metrix's *Weekly*

October 1998 data, extrapolating back to September by taking the difference between the October and December 1998 Media Metrix usage numbers and assuming constant growth per month over the quarter.

3.4 DESCRIPTIVE STATISTICS

Table 1 provides descriptive data on the firms and firm-quarters in our final sample. As measured by length of time since their initial public offering, our firms are quite young. Our oldest firm has been trading (as of March 31, 2000) for less than eight years and the youngest for just one month. The mean (median) trading duration is 19.2 (13) months. Unreported statistics show that only 2 of our firms came public before 1996, while 6 began trading during 1996, 8 in 1997, 14 in 1998, and 33 in the period from January 1, 1999–January 31, 2000. As is true for the Internet firm population in general, most of our sample firms are unprofitable. In only 30 (14%) of the 217 firm-quarters in our sample, and for only 9 (14%) of our 63 firms, were positive profits reported. The market value/earnings (*P/E*) ratio for these few profitable firm-quarters averages an astounding 2,602 (the median is 1,148) and ranges as high as 15,693 (for eBay, second fiscal quarter 1999). The market value/revenue ratio also averages a very high 174 (median of 87), with a maximum of 3,592 (Stamps.com, fourth fiscal quarter 1999). The average market capitalization over these 217 firm-quarters is $7.0 billion (the median is $758 million) and ranges as high as $154.8 billion (America Online, first fiscal quarter 2000). In contrast, the book value of these firms averages only $269.2 million (median of $111.4 million), with a maximum of $6.3 billion. With respect to the Internet usage measures, the average number of unique visitors per month at our firms' web sites is 6.7 million (the median is 2.9 million), with a maximum of 42.9 million. The average number of web site pageviews per month is 798.4 million (median of 59.3 million) and ranges as high as 19.4 billion.

While our firms are, in general, not profitable and have relatively low revenues, they are growing rapidly. The average *quarter-to-quarter* revenue increase is 49.5% (with a median of 31%) and ranges as high as 702.3%. The average quarter-to-quarter gross profit increase is an even greater 76.6% (the median is 32%), with a maximum of 5,190%. At the same time, the growth in unique visitors averages 8.6% (median of 4%), with a maximum of 125.4%, and the growth in pageviews averages 19.6% (median of 6%), with a maximum of 725.9%. As these statistics confirm, investors in the market are clearly paying for growth, rather than current performance.

Table 2, panel A provides statistics on both the dependent variable and the explanatory variables included in at least one of our regressions. All

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Flash. According to the company's web site the *Weekly Flash* "is designed to provide preliminary 'snapshot' audience measurement indicators."

TABLE 1
Firm Characteristics

The sample consists of 63 publicly traded firms listed on internet.com's InternetStockList (as of January 31, 2000) that we classify as either portals, content/community providers, or e-tailers. Summary statistics are presented for 217 firm-quarter observations, covering the period from September 1998 to December 1999. Market value of common shareholders' equity is calculated using the closing price on the day after the earnings announcement multiplied by the total number of shares outstanding at that time. Book value of common shareholders' equity is measured as of the end of the quarter. Net income is equal to the quarterly earnings available to common shareholders. The unique visitors measure is the estimated number of different individuals who visit a firm's web site(s) during a particular month and the pageviews measure is the number of unique visitors multiplied by both the average usage days per visitor and average daily unique pages viewed per visitor in a month. The data for unique visitors and pageviews are provided by Media Metrix, Inc. Age is measured as the number of months since the initial public offering. Growth is measured quarter-to-quarter. All numbers (except age and ratios) are in millions.

Variable	Number of Firm-Quarters	Number of Firms	Mean	Median	Standard Deviation	Minimum	Maximum
Market Value of Equity ($MM)	217	63	7,011	758	21,721	42	154,777
Book Value of Equity ($MM)	217	63	269.2	111.4	597.6	4.2	6,251.0
Net Income ($MM)	217	63	−12.4	−8.5	84.8	−921.5	420.0
Gross Profit ($MM)	217	63	27.6	5.1	96.5	−2.1	791.0
Sales and Marketing Expenses ($MM)	217	63	19.7	9.3	35.1	0.6	261.0
Research and Development Expenses ($MM)	217	63	5.6	1.9	11.6	0.1	80.0
Other Operating Expenses ($MM)	217	63	18.3	4.7	67.6	0.4	920.6
Unique Visitors per Month (MM)	217	63	6.7	2.9	9.3	0.2	42.9
Pageviews per Month (MM)	217	63	798.4	59.3	2,509.3	0.9	19,426.9
Age (Months)	217	63	19.2	13.0	17.7	1.0	93.0
Market Value/Earnings (Earnings > 0)	30	9	2,602	1,148	3,731	12	15,693
Market Value/Revenues (Revenues > 0)	217	63	174	87	340	3	3,592
Revenue Growth per Quarter (%)	213	59	49.5	31.0	72.8	−51.0	702.3
Gross Profit Growth per Quarter (%)	201	57	76.6	32.0	388.0	−827.8	5,190.0
Unique Visitor Growth per Quarter (%)	198	57	8.6	4.0	22.6	−32.7	125.4
Pageview Growth per Quarter (%)	198	49	19.6	6.0	73.6	−55.4	725.9

TABLE 2

TABLE 2

Descriptive Statistics and Correlation Coefficients for the Regression Variables (217 Firm-Quarter Observations)

The sample consists of 63 publicly traded firms listed on internet.com's InternetStockList (as of January 31, 2000) that we classify as either portals, content/community providers, or e-tailers. Summary statistics are presented for 217 firm-quarter observations, covering the period from September 1998 to December 1999. Panel A provides descriptive statistics on the dependent and explanatory variables used in the pooled regressions. Panel B reports the Pearson and Spearman correlation coefficients between the explanatory variables, as well as the corresponding p-values. All variables are deflated by the end-of-quarter book value. Market value of common equity (MV) is calculated using the closing price on the day after the earnings announcement multiplied by the total number of shares outstanding at that time. BV denotes book value of common shareholders' equity at the end of the fiscal quarter. $NTINC$ is net income available to common shareholders. GP denotes gross profits, calculated as revenue minus cost of revenue. $MKTG$ is sales and marketing expenses. RND denotes $R\&D$ expenses. $OTHEXP$ represents other operating expenses, aside from $MKTG$ and RND. $VISITORS$ is the estimated number of different individuals who visit a firm's web site (s) during a particular month and $PAGEVIEWS$ is the number of unique visitors multiplied by both the average usage days per visitor and average daily unique pages viewed per visitor in a month.

Panel A: Descriptive Statistics on the Dependent and Explanatory Variables in the OLS Regressions

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
MV/BV	20.34	8.340	37.28	1.006	350.5
NTINC/BV	-0.147	-0.090	0.248	-2.085	0.567
GP/BV	0.081	0.050	0.090	-0.030	0.836
MKTG/BV	0.125	0.080	0.130	0.007	0.783
RND/BV	0.032	0.020	0.034	0.001	0.303
OTHEXP/BV	0.084	0.050	0.172	0.005	2.083
VISITORS/BV	0.043	0.030	0.051	0.002	0.425
PAGEVIEWS/BV	2.258	0.630	5.642	0.006	59.03

Panel B: Pearson (Lower Triangle) and Spearman (Upper Triangle) Correlations Across the Explanatory Variables, Deflated by Book Value (p-Values Underneath Coefficients)

	1/BV	NTINC/BV	GP/BV	MKTG/BV	RND/BV	OTHEXP/BV	VISITORS/BV	PAGEVIEWS/BV
1/BV	—	-0.492	0.161	0.505	0.454	0.279	0.296	-0.067
		0.000	0.017	0.000	0.000	0.000	0.000	0.324
NTINC/BV	-0.199	—	0.020	-0.651	-0.467	-0.579	0.019	0.259
	0.003		0.773	0.000	0.000	0.000	0.786	0.000
GP/BV	0.035	-0.175	—	0.495	0.511	0.411	0.499	0.521
	0.611	0.010		0.000	0.000	0.000	0.000	0.000
MKTG/BV	0.266	-0.636	0.502	—	0.629	0.523	0.265	0.065
	0.000	0.000	0.000		0.000	0.000	0.000	0.337
RND/BV	0.188	-0.444	0.692	0.702	—	0.445	0.341	0.143
	0.006	0.000	0.000	0.000		0.000	0.000	0.035
OTHEXP/BV	0.063	-0.784	0.239	0.310	0.266	—	0.207	0.133
	0.359	0.000	0.000	0.000	0.000		0.002	0.051
VISITORS/BV	0.230	-0.013	0.404	0.149	0.272	0.122	—	0.320
	0.001	0.849	0.000	0.028	0.000	0.072		0.000
PAGEVIEWS/BV	-0.056	0.143	0.352	-0.031	-0.005	-0.008	0.320	—
	0.414	0.035	0.000	0.649	0.947	0.904	0.000	

of these variables are deflated by book value. The dependent variable, the market-to-book ratio, has a mean of 20.34 and a standard deviation of 37.28. By comparison, the mean net income-to-book value ratio is −0.147, with a standard deviation of 0.248. Gross profits, marketing costs, and research and development expenditures, as a fraction of book value, have means and standard deviations that are roughly equal to each other and no greater than 0.13 in magnitude. The mean unique visitors-to-book value is 0.043, with a standard deviation of 0.051. In contrast, pageviews-to-book value has a much higher mean, 2.258, and a standard deviation of 5.642 that is more than twice as large as its mean.

Panel B of table 2 presents both the Pearson and Spearman correlation coefficients for the independent variables in the regressions (all deflated by book value). As expected, there is a significant negative (Pearson and Spearman) correlation between net income and (1) sales and marketing expenses, (2) research and development costs, and (3) other operating expenses. Somewhat surprisingly, the Pearson correlation with gross profits is significant and negative (although the Spearman correlation is insignificant). Of the Internet usage measures, net income is significantly and positively correlated only with pageviews. Gross profits are positively and significantly correlated with each of the expense components, as well as with both Internet usage measures. The correlation between the two nonfinancial measures, unique visitors and pageviews, is positive and significant (0.32 for Pearson and 0.79 for Spearman). This is not surprising, given that unique visitors is one of the three components used to calculate pageviews.

4. Empirical Results

4.1 THE FULL SAMPLE

In columns A and D of table 3 we report the results of regressing market value on bottom-line net income and on the components of net income (with all variables deflated by book value), without including any of the measures of Internet usage.[17] Consistent with the claim made by some investors that financial statement information is of very limited usefulness in the valuation of Internet firms, we find that the coefficient on net income is not statistically different from zero (column A). The lack of a significant association may be the result of the fact that the net income of Internet firms frequently includes transitory items, on which

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[17] All *t*-statistics are adjusted for heteroscedasticity using White's [1980] standard errors, as long as the null of homoscedasticity is rejected at the 5% level. The reported R^2s are for regressions with the market/book ratio as the dependent variable. We separately compute the R^2s for the market value (undeflated) equations by calculating the correlation between actual market value and the predicted market value from the market/book regressions. For the six regressions reported in table 3, these adjusted R^2s are 0.75, 0.77, 0.65, 0.87, 0.87, and 0.93, respectively. These are not the maximum R^2s obtainable from estimating the market value regressions directly.

TABLE 3

OLS Regressions Based on 217 Firm-Quarter Observations

The sample consists of 63 publicly traded firms listed on internet.com's InternetStock-List (as of January 31, 2000) that we classify as either portals, content/community providers, or e-tailers. The regressions are based on 217 firm-quarter observations, covering the period from September 1998 to December 1999. This table reports the results of regressing market value on various financial and nonfinancial measures (all scaled by book value). Market value of common equity (*MV*) is calculated using the closing price on the day after the earnings announcement multiplied by the total number of shares outstanding at that time. *BV* denotes book value of common shareholders' equity at the end of the fiscal quarter. *NTINC* is net income available to common shareholders. *GP* denotes gross profits, calculated as revenue minus cost of revenue. *MKTG* is sales and marketing expenses. *RND* denotes *R&D* expenses. *OTHEXP* represents other operating expenses, aside from *MKTG* and *RND*. *VISITORS* is the estimated number of different individuals who visit a firm's web site(s) during a particular month and *PAGEVIEWS* is the number of unique visitors multiplied by both the average usage days per visitor and average daily unique pages viewed per visitor in a month. Column A reports the results of regressing market value on net income. Column B (C) gives the results of adding unique visitors (pageviews) as an independent variable. In column D are the results of regressing market value on the components of net income. Column E (F) shows the results when unique visitors (pageviews) is added as an independent variable. The *t*-statistics, underneath the estimated coefficients, are based on White's [1980] standard errors if the null of homoscedasticity is rejected at the 5% level. Those in boldface type indicate statistical significance at the 10% level using a two-tailed test.

	A	B	C	D	E	F
INTERCEPT	20.05	11.18	8.92	−0.89	−1.34	−4.59
	6.03	**3.14**	**3.09**	−0.32	−0.47	**−1.93**
1/*BV* (000)	−99.13	−246.53	−68.87	−73.19	−88.12	−89.36
	−0.79	**−2.04**	−0.68	−0.83	−0.96	−1.18
NTINC/BV	−12.03	−13.81	−24.33			
	−1.15	−1.40	**−2.86**			
GP/BV				302.19	296.00	185.14
				11.13	**10.19**	**6.94**
MKTG/BV				−46.47	−44.82	−37.85
				−2.37	**−2.26**	**−2.25**
RND/BV				103.33	102.75	292.22
				1.21	1.20	**3.84**
OTHEXP/BV				3.73	3.40	7.22
				0.35	0.32	0.79
VISITORS/BV		252.52			23.78	
		5.24			0.61	
PAGEVIEWS/BV			3.93			2.71
			10.68			**8.89**
Adjusted R^2	0.00	0.11	0.34	0.52	0.52	0.65

investors likely place less weight in valuation, as well as the possibility that investors consider some income statement line items to be investments rather than expenses.[18]

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[18] Hayn [1995] documents differences in the market implications of earnings for firms reporting profits and for those reporting losses. She argues that the differences are due to the market's perception of losses as transitory. We do not decompose our sample in this manner, for two reasons. First, the vast majority of our firms have losses. Second, unlike more traditional firms, these losses stem to a large extent from ongoing operating expenditures, such as sales and marketing, and research and development. Therefore, investors may not view as transitory the losses of Internet companies.

Including the components of net income in the regression (column D) we find that gross profits have a positive and significant coefficient of 302.19.[19] This suggests that gross profits are viewed by investors as more permanent in nature and as a less noisy measure of current operating performance than is bottom-line net income. Additionally, the coefficient on sales and marketing costs is a significant −46.47. This implies that, for our sample as a whole, investors view sales and marketing costs as normal expenses of doing business, rather than as investments, just as would be expected for firms in more established industries. However, as we discuss below, this result must be interpreted cautiously since it is not robust to alternative regression specifications. In contrast to sales and marketing expense, the coefficient on research and development costs is, in general, not significantly different from zero. This result is consistent with investors finding these expenses to be of little use in valuing Internet firms. However, the result could also be due to investors viewing these costs as normal expenses for some Internet firms and as investments for others.[20] The coefficient on other operating expenses as well is not significantly different from zero. Since this variable includes many individual income statement line items, we do not attempt to interpret the lack of a significant coefficient.

It is also interesting to note that the intercept term (which corresponds to the coefficient on book value in expression (3)) is statistically greater than zero when included with bottom-line net income but is not statistically positive alongside the components of income. Book value has incremental explanatory power for the stock prices of Internet firms over and above net income; in contrast, when net income is decomposed into its components, book value loses its significance.[21]

In the remaining columns of table 3 we report the results of examining the incremental explanatory power of the Internet usage measures. When included alongside bottom-line net income we find that pageviews and unique visitors have significantly positive coefficients of 3.93 and 252.52, respectively. However, combined with the components of net

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[19] We also run a regression that includes revenues and cost of revenues as separate independent variables in place of gross profits. As expected, the coefficients on these variables are opposite in sign and insignificantly different from each other in magnitude. This decomposition has no effect on the significance of the other independent variables.

[20] Lev and Sougiannis [1996] show that in other industries, capitalized research and development costs are positively priced in the market, consistent with investors viewing research and development as an investment rather than an expense.

[21] That book value loses its significance in the presence of the income statement components may be due to the fact that most of our firms have only recently gone public. Consequently, book value reflects, to a large extent, the cash raised from the initial public offering. Since much of this cash tends to be used for sales and marketing expenditures, as well as for research and development, it is likely that the book value of these firms will be correlated with these individual line items. We thank Trevor Harris for suggesting this explanation.

income, only pageviews have a significantly positive coefficient, equal to 2.71.[22] These results suggest that, while measures of Internet usage are important factors in the valuation of Internet stocks, the individual income statement line items (especially gross profits) capture some of the same information as do the nonfinancial data.[23]

To control for cross-correlations in the residuals across time, we repeat our tests separately for each of the quarters ending September and December 1998, and March, June, September, and December 1999. The results are qualitatively very similar to those obtained using the full sample. In particular, the coefficients on both gross profits and pageviews remain positive and significant in virtually all the quarters, while that for unique visitors becomes insignificantly different from zero in a few cases.

While the goal of this paper is not to address the question of whether Internet stocks are over- or underpriced on an absolute basis, that market value is significantly and positively associated with gross profits, unique visitors, and pageviews, as one would reasonably expect, is consistent with investors pricing these stocks in a rational manner, *relative to each other.* Additional evidence that supports this conclusion is provided later.

4.2 PARTITIONS BY FIRM TYPE

Our results thus far pertain to our full sample of 63 firms. To obtain further insights into the pricing of Internet stocks we analyze separately the e-tailers, and the portal and content/community firms (together referred to as the *p/c* firms). Table 4, panel A presents descriptive statistics for these two groups of firms. The *p/c* firms are older than the e-tailers (with a mean time on the market of a little less than two years, as compared to somewhat more than one year for the e-tailers). They are also larger than the e-tailers, both in terms of mean market value ($9.7 vs. $3.8 billion) and book value ($348.1 vs. $173.5 million). As well, the mean net income of the *p/c* firms is higher than that of the e-tailers (5.6 vs. −34.2 million) as are gross profits (41.2 vs. 11 million). The mean market value/revenue ratio is about the same for the two sets of firms, though (169 for the *p/c* firms and 181 for the e-tailers). (Differences in the market value/earnings ratio are not very meaningful, given the small sample sizes.) In terms of Internet usage, the *p/c* firms have a greater number of visitors (a mean of 9.4 vs. 3.6 million) and pageviews (a mean of 1.2 billion vs. 327.7 million) per month than the e-tailers. The growth rates

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[22] We also run a set of regressions in which both unique visitors and pageviews are included as independent variables along with the financial data. These regressions yield qualitatively similar results to those discussed here.

[23] As a robustness check, we add firm age, growth in revenues, and growth in Internet usage as control variables to our regressions. The results obtained are very similar to those reported above.

TABLE 4

Descriptive Statistics by Firm Type

The sample consists of 63 publicly traded firms listed on internet.com's InternetStockList (as of January 31, 2000) that we classify as either portals, content/community providers, or e-tailers. Summary statistics are presented for 217 firm-quarter observations by firm type, covering the period from September 1998 to December 1999. Market value of common equity (*MV*) is calculated using the closing price on the day after the earnings announcement multiplied by the total number of shares outstanding at that time. *BV* denotes book value of common shareholders' equity at the end of the fiscal quarter. *NTINC* is net income available to common shareholders. *GP* denotes gross profits, calculated as revenue minus cost of revenue. *MKTG* is sales and marketing expenses. *RND* denotes *R&D* expenses. *OTHEXP* represents other operating expenses, aside from *MKTG* and *RND*. *VISITORS* is the estimated number of different individuals who visit a firm's web site(s) during a particular month and *PAGEVIEWS* is the number of unique visitors multiplied by both the average usage days per visitor and average daily unique pages viewed per visitor in a month. The data for unique visitors and pageviews are provided by Media Metrix, Inc. Age is measured as the number of months since the initial public offering. Growth is measured quarter-to-quarter. *N* denotes the number of firm-quarter observations. All numbers (except age and ratios) are in millions. Those numbers in boldface type indicate rejection at the 10% level of the hypothesis that the e-tailer and *p/c* firm subsample means are equal, using a two-sample *t*-test (two-tailed).

			The E-Tailers						The Portal and Content/Community (*p/c*) Firms			
	N	Mean	Median	Std. Dev.	Min.	Max.	N	Mean	Median	Std. Dev.	Min.	Max.
Panel A: Subsample Characteristics												
Market Value of Equity ($MM)	98	**3,783**	671	6,881	46	28,488	119	**9,669**	933	28,442	43	154,777
Book Value of Equity ($MM)	98	**173.5**	84.0	193.1	16.2	852.5	119	**348.1**	114.4	780.5	4.2	6,251.0
Net Income ($MM)	98	**−34.2**	−12.3	100.0	−921.5	6.1	119	**5.6**	−6.5	64.9	−104.1	420.0
Gross Profit ($MM)	98	**11.0**	5.0	16.9	−2.1	87.9	119	**41.2**	5.1	128.1	−1.1	791.0
Sales and Marketing Expenses ($MM)	98	18.4	13.1	22.5	1.3	179.4	119	20.7	7.0	42.8	0.6	261.0
Research and Development Expenses ($MM)	98	5.1	2.4	8.3	0.3	57.7	119	6.0	1.7	13.7	0.1	80.0
Other Operating Expenses ($MM)	98	21.3	4.3	94.4	0.9	920.6	119	15.9	4.8	32.0	0.4	208.0
Unique Visitors per Month (MM)	98	**3.6**	2.0	3.5	0.3	16.6	119	**9.4**	4.6	11.6	0.2	42.9
Pageviews per Month (MM)	98	**327.7**	38.0	1,084.8	0.9	5,673.1	119	**1,185.9**	99.8	3,197.3	1.8	19,426.9
Age (Months)	98	**14.8**	12.0	9.3	1.0	32.0	119	**22.9**	13.0	21.7	4.0	93.0
Market Value/Earnings (Earnings > 0)	8	**6,947**	4,649	5,000	2,479	15,693	22	**1,022**	580	1,041	12	3,370
Market Value/Revenues (Revenues > 0)	98	181	49	469	3	3,592	119	169	103	174	16	1,127
Revenue Growth per Quarter (%)	95	56.0	29.0	96.8	−51.0	702.3	118	44.3	31.0	45.0	−28.2	276.9
Gross Profit Growth per Quarter (%)	87	96.0	30.0	566.4	−827.8	5,190.0	114	61.9	33.0	147.5	−209.0	1,243.1
Unique Visitor Growth per Quarter (%)	90	11.2	8.0	24.9	−32.7	109.4	108	6.4	3.0	20.2	−31.7	125.4
Pageview Growth per Quarter (%)	90	22.4	11.0	68.2	−45.4	535.0	108	17.2	4.0	78.1	−55.4	725.9
Panel B: Descriptive Statistics on the Dependent and Explanatory Variables in the OLS Regressions												
MV/BV	98	23.73	7.240	50.99	1.006	350.5	119	17.55	9.100	19.71	1.500	88.18
NTINC/BV	98	**−0.235**	−0.140	0.316	−2.085	0.064	119	**−0.074**	−0.060	0.138	−0.747	0.567
GP/BV	98	0.089	0.060	0.108	−0.006	0.836	119	0.075	0.050	0.072	−0.030	0.312
MKTG/BV	98	**0.174**	0.130	0.164	0.015	0.783	119	**0.085**	0.070	0.070	0.007	0.511
RND/BV	98	**0.041**	0.030	0.043	0.002	0.303	119	**0.024**	0.020	0.023	0.001	0.098
OTHEXP/BV	98	0.107	0.040	0.243	0.012	2.083	119	0.066	0.050	0.071	0.005	0.606
VISITORS/BV	98	**0.034**	0.020	0.035	0.002	0.178	119	**0.050**	0.030	0.061	0.004	0.425
PAGEVIEWS/BV	98	1.983	0.370	7.034	0.006	59.03	119	2.485	0.750	4.182	0.023	18.73

of the *p/c* firms (with respect to revenues, gross profits, or Internet usage measures), however, are not significantly different from those of the e-tailers.

Panel B provides statistics on both the dependent variable and all of the explanatory variables included in at least one of our regressions, all deflated by book value. The mean market-to-book value ratio of the *p/c* firms (17.55) is not significantly different from that of the e-tailers (23.73). The mean net income-to-book value ratio, though, is higher for the *p/c* firms (−0.074 vs. −0.235 for the e-tailers). The mean marketing expense-to-book value ratio is lower for these firms (0.085 vs. 0.174 for the e-tailers) as well, suggesting that it is relatively more important for the e-tailers than for the *p/c* firms to attract potential buyers to their web sites and to establish a brand name. The mean research and development costs-to-book value ratio is also lower for the *p/c* firms (0.024 vs. 0.041 for the e-tailers). For the nonfinancial measures, the unique visitors-to-book value ratio is higher for the *p/c* firms as compared to the e-tailers (0.050 vs. 0.034), but the pageviews-to-book value ratio is not significantly different between the two subsamples.

Table 5 provides the results of separately regressing the e-tailers' and *p/c* firms' stock prices on the available financial and nonfinancial information (with all variables again deflated by book value).[24] As shown in column A, the coefficient on bottom-line net income is not significantly different from zero for the e-tailers, as is true for our sample as a whole. In contrast, there is a positive and significant coefficient of 44.32 on net income for the *p/c* firms. In this regard, *p/c* firms' shares behave more like those of non-Internet companies. When net income is decomposed into its components (column D), we obtain a coefficient on gross profits of 481.73 (147.46) for the e-tailers (*p/c* firms), which is statistically positive for both firm types, as it is for the entire sample. Additionally, the coefficient on sales and marketing costs for the *p/c* firms, −50.23, is significantly negative; however, the coefficient is insignificantly different from zero for the e-tailers. (As was true for our full sample, this result is not robust to alternative regression specifications.) In both sets of regressions the coefficient on book value (the intercept) is significantly positive for the *p/c* firms. The magnitude ranges between 12.52 and 19.94 for the regressions including bottom-line net income and between 5.25 and 7.31 for the regressions including the components of net income. For the e-tailers the significance of the coefficient disappears when net income is decomposed into its components, as in our sample as a whole. This suggests, once again, that the *p/c* firms are more like non-Internet companies than are the e-tailers.

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[24] As in table 3, the R^2s are for regressions with the market/book ratio as the dependent variable. For the six regressions reported in table 5, the adjusted R^2s for the market value (undeflated) equation are 0.20, 0.45, 0.37, 0.74, 0.74, and 0.76, respectively, for the e-tailers, and 0.82, 0.84, 0.86, 0.87, 0.88, and 0.93, respectively, for the *p/c* firms. Again, these are not the maximum R^2s obtainable from estimating the market value regressions directly.

TABLE 5
OLS Regressions by Firm Type

The sample consists of 63 publicly traded firms listed on internet.com's InternetStockList (as of January 31, 2000) that we classify as either portals, content/community providers, or e-tailers. The regressions are based on 217 firm-quarter observations by firm type, covering the period from September 1998 to December 1999. This table reports the results of separately regressing the e-tailers' (E) and the portals and content/community providers' (P/C) market values on the various financial and nonfinancial measures (with all variables again deflated by book value). Market value of common equity (MV) is calculated using the closing price on the day after the earnings announcement multiplied by the total number of shares outstanding at that time. BV denotes book value of common shareholders' equity at the end of the fiscal quarter. $NTINC$ is net income available to common shareholders. GP denotes gross profits, calculated as revenue minus cost of revenue. $MKTG$ is sales and marketing expenses. RND denotes R&D expenses. $OTHEXP$ represents other operating expenses, aside from $MKTG$ and RND. $VISITORS$ is the estimated number of different individuals who visit a firm's web site(s) during a particular month and $PAGEVIEWS$ is the number of unique visitors multiplied by both the average usage days per visitor and average daily unique pages viewed per visitor in a month. N denotes the number of firm-quarter observations. Column A reports the results of regressing market value on net income. Column B (C) gives the results of adding unique visitors (pageviews) as an independent variable. In column D are the results of regressing market value on the components of net income. Column E (F) shows the results when unique visitors (pageviews) is added as an independent variable. The t-statistics, underneath the estimated coefficients, are based on White's [1980] standard errors if the null of homoscedasticity is rejected at the 5% level. Those in boldface type indicate statistical significance at the 10% level using a two-tailed test.

	A		B		C		D		E		F	
	E	P/C	E	P/C	E	P/C	E	P/C	E	P/C	E	P/C
INTERCEPT	23.60	19.94	9.66	13.25	11.71	12.52	3.60	7.31	3.17	6.28	-2.19	5.25
	2.92	**9.41**	1.24	**6.08**	**1.78**	**6.04**	0.73	**2.73**	0.63	**2.42**	-0.55	**2.10**
1/BV (000)	-327.88	58.58	-939.21	-21.92	-318.11	71.48	-527.32	-9.18	-560.29	-38.29	-457.69	-7.73
	-0.85	0.79	**-2.55**	-0.33	-1.04	1.14	**-2.10**	-0.14	**-2.10**	-0.60	**-2.27**	-0.13
NTINC/BV	-20.81	44.32	-15.58	41.09	-32.93	30.91						
	-1.25	**3.26**	-1.04	**3.43**	**-2.48**	**2.66**						
GP/BV							481.73	147.46	475.08	124.68	313.94	88.70
							10.58	**5.89**	**9.69**	**4.98**	**7.26**	**3.40**
MKTG/BV							-46.12	-50.23	-44.68	-41.82	-50.23	-38.90
							-1.49	**-1.98**	-1.43	**-1.70**	**-2.03**	**-1.66**
RND/BV							-170.87	80.50	-174.51	56.69	181.02	120.99
							-1.23	0.99	-1.25	0.72	1.49	1.61
OTHEXP/BV							-1.23	25.20	-1.13	2.06	3.16	25.49
							-0.10	1.01	-0.09	0.08	0.31	1.11
VISITORS/BV			703.26	154.16					40.48	91.61		
			4.96	**5.93**					0.38	**3.26**		
PAGEVIEWS/BV					4.48	2.51					2.87	1.80
					7.66	**7.01**					**7.23**	**4.73**
Adjusted R^2	0.00	0.07	0.20	0.28	0.38	0.34	0.68	0.32	0.68	0.38	0.79	0.43
No. of Observations	98	119	98	119	98	119	98	119	98	119	98	119

With respect to the nonfinancial data, the coefficients on unique visitors and pageviews are significantly positive for both the e-tailers and the *p/c* firms in every instance but one. That one exception is for the e-tailers, where the coefficient on unique visitors becomes insignificantly different from zero in the regression which includes the components of net income (the coefficient on pageviews, 2.87, continues to be significantly positive in this case). This suggests that investors consider it insufficient for an e-tailer to bring visitors to its site(s); the visitors must actually spend time searching the pages for items to buy.[25]

As in any industry classification, our e-tailers and *p/c* firms reflect somewhat diverse groups of companies. For example, in the e-tailer group, Amazon.com fits the traditional retailer definition in that it buys at wholesale and sells at retail, while eBay is in some sense an e-commerce enabler, in that it provides services and software that enable individuals to buy and sell goods among themselves. Furthermore, some of the e-tailers provide content as well. In the *p/c* group, iVillage is more of a pure content/community firm, delivering information of interest to women, while Autoweb.com not only provides information for car buyers and owners but also serves to match potential buyers with car dealers. America Online, in addition to serving as a portal, receives subscription revenues from customers.

While this diversity permits increased subsample sizes, it has the potential for introducing noise into our regression results. In a series of untabulated tests we restrict our e-tailer group to only those firms whose business model entails, for the most part, buying goods and services at wholesale and selling them at retail. For example, we eliminate eBay, since they do not sell their own goods, and Ticketmaster Online-City Search, since they not only sell tickets but also provide free city guides through the City Search web site. We remove from our *p/c* group those firms with a substantial amount of e-commerce or subscription revenues, such as America Online and Student Advantage.

For the restricted e-tailer subsample we find (in untabulated results) a coefficient on bottom-line net income of −69.28, which is significantly negative (the *t*-statistic is −3.13). The coefficient on gross profits, equal to 349.34, is significantly positive, as before (the *t*-statistic is 8.55). In contrast to our prior results, the coefficient on book value is, in general, now insignificantly different from zero in regressions which include net income. Furthermore, the coefficient on research and development costs of 232.42 is significantly positive (the *t*-statistic is 2.05), suggesting that investors consider it to be an investment rather than an expense. As before, the coefficients on unique visitors and pageviews, equal to 1,130.61 and 32.38, respectively, are significantly positive in regressions

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[25] As we do for the full sample, we check the robustness of our findings by adding firm age, growth in revenues, and growth in Internet usage in our subsample regressions. The qualitative findings remain unchanged.

with bottom-line net income (the *t*-statistics are 5.14 and 4.69, respectively). However, when income is decomposed into its components, the coefficients become insignificantly different from zero. The pure e-tailers, therefore, look like traditional retailers in that the detailed financial statement numbers have a strong association with stock prices, but measures of Internet traffic do not. The regression results for our restricted sample of *p/c* firms is, for the most part, the same as previously found. Overall, these results suggest that the role played by financial and nonfinancial data in the valuation of e-tailers depends on how e-tailers are defined; this is less true for the *p/c* firms.

4.3 ADDITIONAL ANALYSES

As a robustness check we estimate all of our regressions using revenues as an alternative deflator. For the two sets of regressions that include unique visitors, we also alternatively deflate by that variable. In addition, we run the regressions on an undeflated basis, with influential observations removed. The large majority of our results are unaffected by all of these transformations. Untabulated findings for the full sample indicate that the differences are concentrated, for the most part, in net income, sales and marketing expenses, and unique visitors. Specifically, the coefficient on net income becomes significantly positive when revenues are used as the deflator but remains insignificant in the undeflated regression. Further, the coefficient on sales and marketing expenses turns positive and significant with revenues as the deflator and becomes insignificant when the variables are undeflated. Finally, the coefficient on unique visitors, previously found to be insignificant, becomes positive and significant in all of our alternative specifications, strengthening our conclusion concerning the importance of web usage measures. Similar small differences arise in the e-tailer and *p/c* regressions. Overall, these findings confirm the robustness of our results.

For our next set of analyses we separately partition our full sample according to (1) current-quarter gross profit growth, (2) months since initial public offering, and (3) number of pageviews per month. (We retain book value as our deflator in all three cases.) By comparing the coefficients on gross profits (which is akin to a price-to-gross profits multiple) across the two groups in each partition, this analysis provides additional evidence on whether Internet firm stock prices appear to be set rationally on a relative basis. Under the assumption that current gross profit growth is positively correlated with future growth (see Trueman, Wong, and Zhang [2000] for supporting evidence), we expect the gross profits multiple to be more positive for the high-growth partition. We would expect the multiple to be more positive for the younger firms, because they likely have relatively higher levels of fixed costs included in current gross profits and a greater potential to exploit economies of scale. To the extent that the number of pageviews correlates positively with potential barriers to entry, the high pageview subsample would be

expected to have a greater multiple on gross profits.[26] Consistent with these conjectures, we find that the high-growth firms have a multiple on gross profits of 410, compared to 106 for the low-growth firms; the younger firms have a multiple of 485, compared to 242 for the older firms; and the firms with high pageviews have a multiple of 356, compared to 108 for the low pageview firms. (All three differences are significant at the 1% level.)

Our final analysis concerns the impact on firm valuation of the share lockup period. Since most of our sample firms are quite young, several of our firm-quarter observations fall within the insider share lockup period. During this period insiders (such as managers, directors, employees, and venture capitalists) are prohibited from selling their shares; as a result, the share float is a small fraction (often 20% or less) of the total number of shares outstanding. To the extent that a firm's stock price is artificially inflated during the lockup period due to a restriction on the supply of shares, the relation between the financial and nonfinancial measures and market value during this time might not be representative of that existing after the lockup ends.

To explore the impact of the lockup period on our results, we run separate regressions for the 78 firm-quarter observations (out of 217) falling within the first six months after the initial public offering and for those falling outside of that period. We choose six months since it is the normal lockup period. For the most part we find that the (untabulated) subsample results are similar to each other and to our full-sample results. In particular, the coefficients on gross profits and pageviews remain significant and positive, while the coefficient on unique visitors is generally insignificantly different from zero. In addition, the coefficient on book value continues to be significantly positive in regressions which include net income. However, for the regressions which include the income statement components, the coefficient on book value becomes significantly negative for the firm-quarters beyond the lockup period and significantly positive during lockup. In addition, the coefficient on marketing expenses remains negative and significant post-lockup but becomes insignificantly different from zero in the earlier period. This latter result is consistent with the post-lockup firms being older and with investors treating their marketing costs as they would those of more established companies.

5. Summary and Conclusions

In this paper we examine how investors employ (relatively sparse) financial information, along with measures of Internet usage, in the valuation of Internet firms. Consistent with the claim by some that financial information is of little use in the valuation of Internet stocks, there is

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[26] We thank the referee for suggesting some of this analysis.

an insignificant association between bottom-line net income and market prices. When net income is broken down into its components, gross profits are positively and significantly associated with stock prices. This result is consistent with the observation that Internet firms' bottom lines often include large transitory items, as well as items that investors might consider investments rather than expenses. Gross profits, in contrast, reflect a firm's current operating performance and are likely to be more permanent.

When added to bottom-line net income, both unique visitors and pageviews provide significant incremental explanatory power for stock prices. Alongside the components of net income the information on pageviews retains its significant association with market prices; the information on unique visitors does not. This implies that the number of pages viewed by each visitor gives important information to investors. It also suggests that unique visitors capture some of the same information as do the individual income statement line items (especially gross profits).

We divide our sample into two groups, the e-tailers, and the portal and content/community firms (the *p/c* firms). For the e-tailers we find that bottom-line net income is not significantly associated with stock prices, as for our sample as a whole. For the *p/c* firms, though, a positive and significant association exists, just as is generally the case for non-Internet companies. With respect to the nonfinancial data, we find that both pageviews and unique visitors have incremental explanatory power, in general, for both the e-tailer and *p/c* firm subsamples. However, for the e-tailers the unique visitors measure loses its significant association with stock prices when combined with the components of net income, just as in the full sample.

Many additional issues of interest lie within this line of research. One is the forecasting of future revenues using financial and nonfinancial data, which is the subject of Trueman, Wong, and Zhang [2000]. Another is an examination of whether Internet stocks are rationally priced on an absolute basis. Findings from studies such as these should further enhance our understanding of the valuation of Internet stocks.

APPENDIX A
The Sample Firms

This appendix lists the names and ticker symbols of the 63 Internet companies in our final sample. The initial sample consists of firms that appear on the InternetStockList, complied by internet.com, as of January 31, 2000, as well as Netscape, Geocities, broadcast.com, Excite, Onsale, and Xoom.com. We retain those firms that we judge to be primarily portals, content/community providers, or e-tailers. This leaves us with 95 firms. We exclude all firm-quarters for which either the firm's earnings announcement does not disclose all of the individual income statement line items needed for our analysis, or for which the firm's

common equity book value is negative. This reduces our sample by 27 firms. We further exclude another 5 firms for which Media Metrix data are not available.

	Firm Name (Previous Name)	Ticker		Firm Name (Previous Name)	Ticker
1	About.com	BOUT	31	Hoovers	HOOV
	(Miningco.com)		32	Infoseek	SEEK
2	Amazon.com	AMZN	33	Infospace.com	INSP
3	America Online	AOL	34	Intelligent Life	ILIF
4	Ask Jeeves	ASKJ	35	iVillage	IVIL
5	Autoweb.com	AWEB	36	Launch Media	LAUN
6	barnesandnoble.com	BNBN	37	Liquid Audio	LQID
7	Beyond.com	BYND	38	Looksmart	LOOK
	(Software.net)		39	Lycos	LCOS
8	Bigstar Entertainment	BGST	40	MapQuest.com	MQST
9	broadcast.com	BCST	41	MarketWatch.com	MKTW
10	C/NET	CNET	42	MP3.com	MPPP
11	CareerBuilder	CBDR	43	Multex.com	MLTX
12	CDNow	CDNW	44	Netscape	NSCP
13	Crosswalk.com	AMEN	45	Onsale	ONSL
	(Didax)		46	Planetrx.com	PLRX
14	Cyberian Outpost	COOL	47	Preview Travel	PTVL
15	Drugstore.com	DSCM	48	priceline.com	PCLN
16	EarthWeb	EWBX	49	RealNetworks	RNWK
17	EBay	EBAY	50	Salon.com	SALN
18	Egghead.com	EGGS	51	Smarterkids.com	SKDS
19	emusic.com	EMUS	52	SportsLine USA	SPLN
	(Goodnoise)		53	Stamps.com	STMP
20	E-stamp	ESTM	54	Student Advantage	STAD
21	EToys	ETYS	55	theglobe.com	TGLO
22	Excite	XCIT	56	TheStreet.com	TSCM
23	Expedia	EXPE	57	Ticketmaster Online-	TMCS
24	FatBrain.com	FATB		City Search	
	(Computer Literacy)		58	Tickets.com	TIXX
25	FTD.com	EFTD	59	uBid	UBID
26	Garden.com	GDEN	60	Value America	VUSA
27	Geocities	GCTY	61	Vitaminshoppe.com	VSHP
28	Go2Net	GNET	62	Xoom.com	XMCM
29	GoTo.com	GOTO	63	Yahoo!	YHOO
30	Homestore.com	HOMS			

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