

Internet Stocks: Valuations and Trading Strategy

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I. INTRODUCTION

Doubtless, if you've been anywhere near a TV screen or business publication the last few years, the hot topic has been the impressive performance of many e-commerce-related stocks. Stock prices have skyrocketed to short-sellers dismay. This phenomenon has largely confounded the experts and led to apocalyptic predictions for Internet stocks ranging from significant corrections to bursting bubbles. These predictions largely reflect conventional wisdom that the value of a stock depends on the present value of future cash flows. These cash flow predictions often are based on extrapolations of existing performance and occur for relatively short time horizons. In other words, the tools currently used reflect a "left to right" approach to forecasting financial performance. A more appropriate perspective is one of odds-setting on expected future success of a particular strategy as a percentage of the total market opportunity. This approach views the market as odds-makers and investors as bettors. By taking this quite rational perspective, assertions can be made on predicting performance of Internet stocks based on behaviors of investors in this odds-setting environment and the expected future performance of individual stocks in relation to the overall adoption of Internet technology by consumers. This paper discusses a "right to left" approach to understanding Internet stock valuations.

If Internet stock valuations can be explained through this "right to left" approach, the next question is "Can we use this perspective to develop a trading strategy to beat benchmark measures of performance?". The second half of this paper also discusses the use of "proxy" measures to predict stock returns. The use of proxy returns is justified due to the "unstable" environment in which the industry now finds itself.

II. MAKING SENSE OF INTERNET STOCK VALUATIONS

A. Mature versus growth markets

Traditional valuation methods have relied on the ability of analysts to make three reasonably accurate assumptions:

1. **The number of players in a market exists and is known** – In a given mature industry, it is rather easy to identify who the players are and how many there are. Market share for a given firm is easily identified and gives a picture of the relative success of a firm in competing for consumers' spending dollars. In a growth market, the number of players is unstable and dynamic. Developing an accurate picture of relative success is not only impossible, but largely inconsequential. In fact, the market itself is difficult to define. Players that exist today, may disappear in the near future. Thanks to unprecedented venture capital activity and "brain drain" (talented managers of Fortune 500 companies, leaving corporate jobs for entrepreneurial opportunities) viable new competitors may appear unexpectedly. In traditional valuation analysis, expected future market share performance is used to make assumptions about future financial firm performance. These assumptions are no longer relevant.

2. **The size of the market can be assessed and predicted** – Mature industries have well-defined markets and market sizes. It's clear, for example, how many automobiles will be sold in the US this year. Analysts' predictions will typically come within 5-10 % of actual sales. Growth industries, by definition, exhibit change. Market sizes are increasing at a higher-than-average rate. This growth also means that a steady-state condition is difficult to forecast both from a size and timing perspective. An inability to forecast future market size and growth reduces the ability of analysts to set "terminal values" (end-state forecasts used to determine financial performance beyond the forecast horizon – e.g. sales revenue level and growth to eternity) when valuing firms. Terminal value assumptions can dramatically affect valuation calculations. The lack of a reliable terminal value assumption makes valuations using this method useless.
3. **Short-term performance can be extrapolated from current performance and management guidance** – Traditional valuation methods have used recent past historical performance and management guidance to forecast short-term financial performance. For a firm in a mature market, decision-making is driven by profit maximization. The firm is expected to "tweak" its investments in order to achieve improved profitability (e.g. invest in enterprise resource planning software to improve productivity and lower inventory costs). In a growth market, the firm is investing almost exclusively in maximizing growth or market reach. In fact, in some cases growth cannot be measured through revenues. The firm may be "giving away" its product to lock in customers – increasing switching costs – and improving its probability of success. Traditional methods would penalize the firm for such investments, but strategic principles and past case studies indicate this approach is critical to improving its market position. The firm is acting to improve its chances of survival and market leadership. These two environments are radically different and require very different decisions on the part of managers. Traditional valuation methods are not capable of valuing these "growth" decisions.

Without these assumptions, analysts cannot use a DCF or abnormal earnings approach to value a firm. Analysts using these approaches have thrown up their hands and determined that Internet stocks must be overvalued. In light of these seemingly "unsustainable" valuations, many investors have chosen to short-sell Internet stocks with a predictably dismal result. To further add confusion to the situation, one would expect that the increased efficiency of markets (driven by the "democratization" of the market and the proliferation of information) and the technology revolution that such speculative bubbles would quickly be ferreted out by the market and valuations would adjust accordingly. In fact, the opposite is true. Internet "blue-chip" stocks have not only seen steadily increasing values but have weathered market shocks such as the Russian financial crisis and the Asian crisis. Either one of these events should have been enough to act as a pin-prick to deflate this "speculative bubble". This is clearly not the case. Another approach to understanding market behavior must be taken.

B. Horse racing and odds setting

"Unseasoned companies in new fields of activity...provide no sound basis for the determination of intrinsic value.... Analysts serve their discipline best by identifying such companies as highly speculative and not attempting to value them.... The buyer of such securities is not making an investment, but a bet on a new technology, a new market, a new service.... Winning bets on such situations can produce very rich rewards, but they are in an odds-setting rather than a valuation process."

One might think the preceding quote is an excerpt from a research report from Hambrecht & Quist or The Motley Fool justifying stock valuations. In fact this comes from the book *Security Analysis* written in 1934 by the great value investor, Benjamin Graham, and his partner, David Dodd. No additional analysis or quantitative methods are provided. Rather, it serves as a warning to investors, letting them know they are no longer investors but speculators, going to Wall Street's version of the race track. Viewing market valuations as odds against success rather than the present value of future cash flows provides us with a method for understanding market behavior and developing a strategy for capitalizing on this behavior. In fact, it is possible that Internet stocks are undervalued, given conventional wisdom regarding the structural change the Internet is undoubtedly going to create.

The first assumption that must be made in understanding the "right to left" approach is that the Internet will dominate commercial activities and represent the lion's share of retail transactions after the current structural shift has taken effect (i.e. the end-state scenario). This is not a terribly risky assumption. Most analysts and strategic thinkers agree the Internet revolution has unprecedented potential for

dominating commerce. The Internet will not only cause a shift in transactions within existing markets (e.g. retail sales of music, books and videos), but will also create new markets (e.g. on-line behavior “click tracking” analysts such as Doubleclick.com). For now, we will address only the shift in transactions in existing markets. In this way, we can make market-based assumptions about the market (e.g. how quickly the market will grow, the size of the market, etc.) based largely on macroeconomic factors. The source of uncertainty then arises from the adoption of technology by consumers in general. This technology-adoption behavior drives the speed at which transactions move from alternative sources to the Internet.

The second assumption that must be made regarding the end-state scenario centers around the firm in question. A firm can be expected to reach a certain market share based on decisions it makes today that may or may not position it to command a certain level of market share. For example, it would be difficult to envision the Internet economy in the end-state scenario without the likes of an Amazon.com. There is a reasonable probability that Amazon will be a player once the structural shift has taken place. If it is not, a more likely scenario is that it will have merged with another firm and perhaps taken on a different form. The question then becomes “How much market share will Amazon command?”. This question will be addressed later. The point is that one must envision an end-state scenario where the firm in question is a player in the market and has a certain market share in order for this approach to be meaningful.

The third assumption centers around expected cash flow margins. In the end-state scenario, the industry is expected to have a particular net cash flow as a percentage of total revenues. In the case of the retail industry, these margins have been relatively stable. The Internet will probably reduce these margins due to the increased buyer power and threat of entry that will characterize this market. If we understand what these margins are and know the total size of the market, we can develop a “present value” or market capitalization of all the players in a particular market using the perpetuity formula (assuming a historical risk-free rate and growth rate).

With these three assumptions, we can develop an expected market capitalization for a firm in the end-state scenario. This end-state market capitalization represents the “payoff” investors can expect from betting on a particular firm - much like the payoff a bettor can expect to receive from the outcome of a horse race. The difference lies in the fact that the bettors’ payoff at the racetrack is driven by bets placed by others. The stock investor’s payoff is derived from expected future cash flows. [Exhibit A](#) shows a hypothetical case for Amazon and the general merchandise and miscellaneous retail sales industry. Here we have used economic data to make the following assumptions:

- Total Market Capitalization of Industry in USA and Europe (e.g. Retail: \$1.45T ,percentage FCF margin = 5%) [Hoover’s industry overview, 1998]
- Expected Market Cap position of firm (PV \$) (e.g. Amazon: Market Share = 10% MCAP = \$145B)
- Current Market Cap of firm (e.g. Amazon MCAP as of 8-31-99 = \$14.14B)
- Current Value of firm using existing financial performance baseline (e.g. Not Applicable - no earnings)

In this analysis we have assumed an expected market share in the end-state scenario of 10%. This is conservative given Amazon’s current on-line retail market share and its success in beating back new entrants such as BarnesandNoble.com. It is not difficult to envision Amazon retaining a 10% share after the structural shift has settled down – and consequently achieving an expected market cap of \$145B. Given the market capitalization on 8-31-99 of \$ 14.14B, we assert that the market has placed 10 to 1 odds on Amazon “crossing the finish line” in the above mentioned market position.

This behavior also explains the volatility of Internet stocks. If we look at the change in odds observed in the days leading up to major sporting events, any news that affects a team’s ability to compete (e.g. the starting quarterback of a super bowl finalist breaks his leg, significantly affecting his team’s ability to win) changes the odds dramatically. The same holds true for Internet stocks. Announcements of potential future moves can dramatically affect the future competitiveness of the firm and because there are no “financial performance” measures to provide guidance on the impact of such moves, the market assesses the situation based solely on qualitative factors – making market valuations more volatile. Analysts are not assessing the news on the effect on next quarter’s earnings, but rather on the end-state scenario.

C. Setting the odds using Porter's Five Forces Model

The “right to left” approach to Internet stock valuations provides justification for the current investment environment. Can we use this framework to forecast future asset returns? The answer may lie in using management frameworks to assess the viability of a particular business strategy. A detailed method of “scoring” a firm’s strategic viability based on a framework such as Porter’s Five Forces is highly subjective and outside the scope of this paper, however, it could yield insight into the impact of various factors on stock price. One argument against this method is that such analysis is qualitative and converting these factors to a quantitative basis is highly subjective. This is true, however, the goal of such an approach must be to assess the relative value of a firm based on both previous performance and competitors. In this context, changes in “scoring” in the Five Forces Model may provide insight into expected future asset returns.

D. Industry Growth Behavior and Technology Adoption

One factor that affects the “odds” being set by the market is the rate at which the market in question is growing. [Exhibit B](#) shows the typical behavior of market size growth. This curve is characterized by an increasing rate of growth in the initial stage, followed by an inflection point where market size then grows at a decreasing rate. This curve mimics the rate of technological adoption by consumers as demonstrated by previous products such as television and radio. The size of the market can be expected to behave in the same way as consumers adopt the Internet as their preferred means of buying goods and services. By assuming this growth behavior, we can use previous technology adoption curves to predict the potential size of the market and the rates at which the market will grow given the time period and end-state assumptions. Further, the adoption of technology can be decomposed into two separate adoption curves. The first is the adoption of PC technology in the home. The second is the adoption of the Internet as a means for transacting as consumers bring PC’s into the home. An argument can be made that the adoption cycle may be past the halfway point in the US, based on sales of PC’s and number of households in the US. The Internet adoption cycle, however, is in its infancy. As one example, general merchandise and miscellaneous retail sales on the Internet are less than 5% of the total market. Even if one assumes that half of all business will be transacted on the Internet in an end-state scenario, 5% is still clearly in the “positive acceleration” segment of the market size growth curve.

One difficulty in performing this type of analysis on Internet industries is the changing definition of industries. What industry does Yahoo! play in? Is it in the portal industry? Is it an information broker or a directory service. In defining its market, how will revenues be related to operational performance? Clearly, some definition around the business model must occur before applying this model to new markets/industries.

This analysis is outside of the scope of this paper, however, the characteristics of previous adoption curves, coupled with market size growth data may provide insights into potential market end-state scenarios.

III. TRADING STRATEGY FOR INTERNET STOCKS

The general strategy for trading is based upon sorting Internet stocks by a proxy ratio for future income and investing in the high performers. As the pool of stocks, we used all stocks listed in the H&Q Internet index. Not all of these stocks were traded at the beginning of 1995, so the number of stocks in the portfolio increased over time. Since sales figures were frequently used in our future income proxy, we conducted our sorts and trades on a quarterly basis. All trades were assumed to occur on the last day of the second month following the quarter upon which the analysis was conducted. Returns were calculated for the 30-day holding period of the portfolio (last day of the second month of the following quarter to the last day of the second month of the following quarter) with trading costs excluded. We benchmarked our performance to the H&Q Internet Index (a buy and hold strategy for Internet stocks), since even a buy and hold strategy on Internet stocks would outperform the S&P 500. [\[See Exhibit C\]](#)

We investigated four proxies for future income: Sales Growth, Market Cap/Sales, Price/Sales and Sales Growth ratio (PSSG) and Price/Sales and Sales Acceleration ratio (PSSA). Both the Price/Sales and Sales Growth ratio and Price/Sales and Sales Acceleration ratio are derived based on the same principle

of using Price/Earnings and Earnings Growth (PEG). Sales acceleration is the change in sales growth between periods. For each quarter, we selected the top 25% of the stocks sorted by each proxy separately, creating four different portfolios. The first quarter of analysis was the first quarter of 1995 and the analysis continued through the second quarter of 1999. The most successful strategy was the MCAP/Sales strategy, followed by PSSG, sales growth and PSSA. PSSA strategy actually did worse than the buy and hold, and sales growth strategy did only marginally better than buy and hold. Trading costs change the desirability of our winning strategies vis-à-vis the buy and hold strategy only for portfolios of less than \$13,000. We assumed that portfolios utilizing our strategies would be at least \$100,000 in value, and thus we did not include the effect of transaction costs in our analysis. For our analysis, no more than 14 trades (7 buy and 7 sell) were conducted in any quarter. At \$10/trade from a discount broker, this activity costs at most \$140 per quarter. For a \$13,000 portfolio, the transaction costs are thus 1.08% per quarter, and for a \$100,000 portfolio, the transaction costs are .14% per quarter. Since even a 1.08% reduction in the average quarterly return would not make any of our winning strategies worse than the buy and hold strategy, we did not include transaction costs in making the determination of our best trading strategy. [Exhibit D](#) gives a recapitulation of the quarterly and overall results.

IV. BIOGRAPHIES

Rob Freund (robert.freund@alumni.duke.edu) is a graduate of Duke University with a Master's of Business Administration and a Bachelor's of Science in Physics. He served for eight years in the United States Navy as a Supply Corps officer, completing tours of duty aboard the USS BOISE (SSN 764) and at the Naval Inventory Control Point in Mechanicsburg, PA (NAVICP-M). As Supply Officer for BOISE, he finished the ship's final construction phase and took it through initial sea trials and certifications, the ship's maiden deployment to the Mediterranean Sea and Persian Gulf and workups for its first North Atlantic deployment. As the Deputy Director of the Support Determination Department of the Nuclear Reactors Logistics Support Directorate at the Naval Inventory Control Point, he oversaw Nuclear Coordinated Shipboard Allowance List product line extensions and improved NAVICP monitoring actions of outside agencies.

Petter Hellman (petter_hellman@hotmail.com) is an exchange student from Norway. Petter is currently associated with A.T. Kearney in Norway.

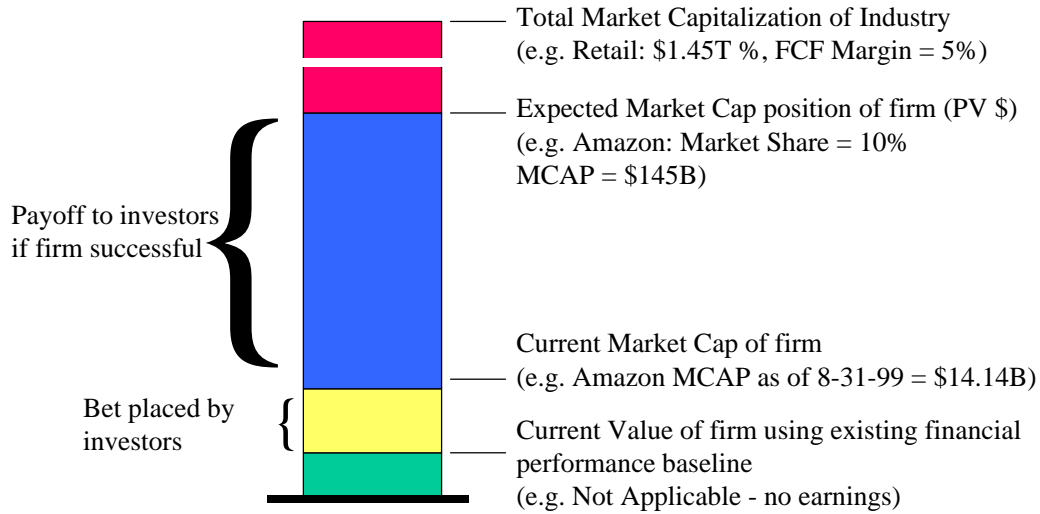
Ole Hvidsten (o_c_hvidsten@hotmail.com) is also an exchange student from Norway. Ole is currently associated with Sundal Collier & Co., a Norwegian brokerage firm, in the Corporate Finance Department

Richard Solano (richardsolano@yahoo.com) is a graduate of Duke University with a Master's degree in Business Administration. Richard brings over 9 years of professional experience helping various Fortune 500 companies implement business process and information technology solutions. He has worked for such blue chip companies as EDS, General Motors, Volkswagen, PricewaterhouseCoopers and is currently associated with Booz-Allen & Hamilton. His consulting clients include such global organizations as General Electric, Bristol-Myers Squibb and Handleman Music Distributors.

Jiong Shao (jiong.shao@duke.edu) is a graduate of Duke University with a Master's degree in Business Administration. Jiong also has a master's degree in engineering and worked as an engineer for about 7 years prior to Fuqua. Jiong is currently associated with Lehman Brothers.

V. EXHIBITS

Exhibit A - Laying Odds on Success of Firm's Value Proposition



Price of bet influenced by factors affecting expected future outcome (e.g. starting QB breaks leg day before Superbowl) - IN THIS CASE, MARKET HAS SET 10-1 ODDS ON AMAZON CROSSING THE FINISH LINE IN THIS POSITION

Exhibit B - Industry Growth versus Time

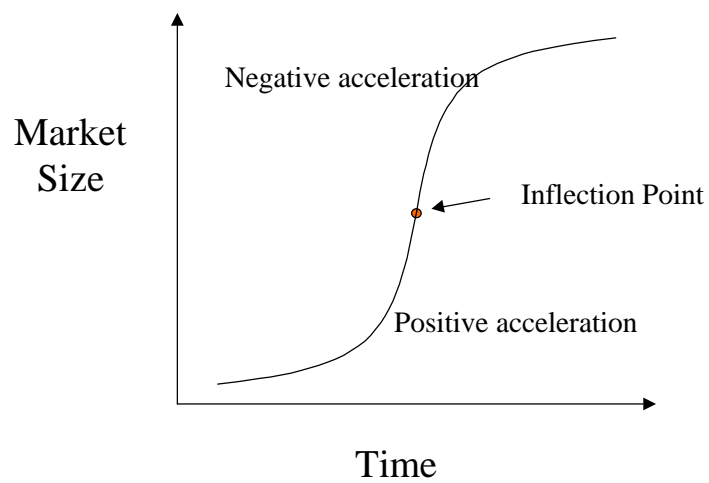
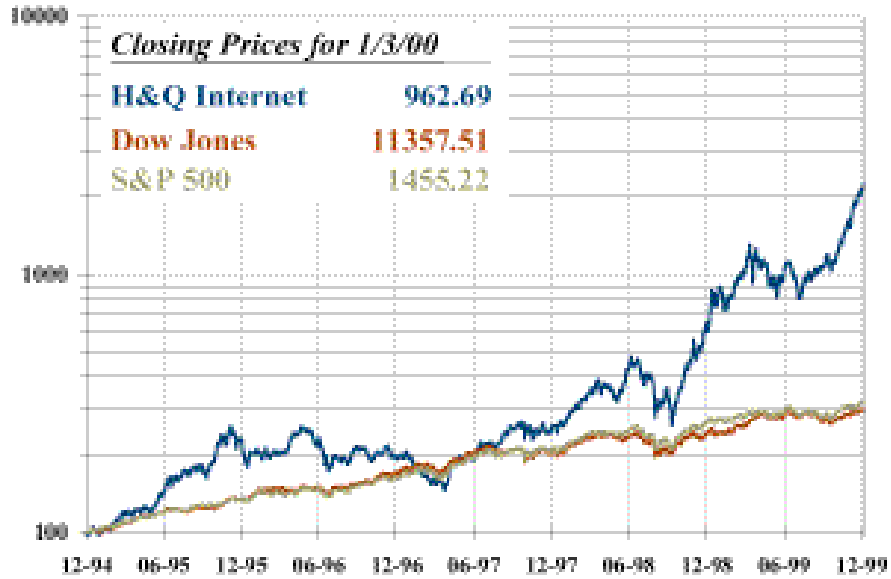


Exhibit C - H & Q Internet index



Due to MCAP weighting - the index return has been significantly skewed by a few extraordinarily successful stocks

Exhibit D - Results of Various Sort-Trading Strategies

Calendar Quarter	Average Quarterly Returns		Average Quarterly Returns		Average Quarterly Returns		Average Quarterly Returns		Average Quarterly Returns	
	Buy and Hold Strategy	B & H Strategy	MCAP / Sales Strategy	MCAP / Sales Strategy	PSSG Strategy	PSSG Strategy	PSSA Strategy	PSSA Strategy	Sls Growth Strategy	Sls Growth Strategy
1995 - Q0		\$ 1.00		\$ 1.00		\$ 1.00		\$ 1.00		\$ 1.00
1995 - Q1	-8.89%	\$ 0.91	25.98%	\$ 1.26	-18.48%	\$ 0.82	-18.48%	\$ 0.82	-18.48%	\$ 0.82
1995 - Q2	23.47%	\$ 1.12	36.75%	\$ 1.72	40.33%	\$ 1.14	43.17%	\$ 1.17	43.17%	\$ 1.17
1995 - Q3	2.32%	\$ 1.15	-25.07%	\$ 1.29	23.36%	\$ 1.41	23.36%	\$ 1.44	23.36%	\$ 1.44
1995 - Q4	-19.27%	\$ 0.93	-12.54%	\$ 1.13	-12.44%	\$ 1.24	-28.25%	\$ 1.03	-49.59%	\$ 0.73
1996 - Q1	20.42%	\$ 1.12	20.68%	\$ 1.36	11.15%	\$ 1.37	5.00%	\$ 1.08	5.70%	\$ 0.77
1996 - Q2	-28.84%	\$ 0.80	-26.92%	\$ 1.00	-27.49%	\$ 1.00	-11.46%	\$ 0.96	-27.49%	\$ 0.56
1996 - Q3	-14.75%	\$ 0.68	-6.22%	\$ 0.93	-17.72%	\$ 0.82	-37.47%	\$ 0.60	-19.32%	\$ 0.45
1996 - Q4	-9.36%	\$ 0.62	-24.32%	\$ 0.71	-4.82%	\$ 0.78	-31.59%	\$ 0.41	21.56%	\$ 0.55
1997 - Q1	-5.36%	\$ 0.58	-9.40%	\$ 0.64	-8.42%	\$ 0.71	14.63%	\$ 0.47	-9.45%	\$ 0.49
1997 - Q2	17.30%	\$ 0.68	0.81%	\$ 0.65	-6.11%	\$ 0.67	-3.42%	\$ 0.45	3.50%	\$ 0.51
1997 - Q3	3.14%	\$ 0.70	14.74%	\$ 0.74	-14.40%	\$ 0.57	-7.42%	\$ 0.42	-9.15%	\$ 0.46
1997 - Q4	16.58%	\$ 0.82	9.76%	\$ 0.81	23.62%	\$ 0.71	11.88%	\$ 0.47	20.76%	\$ 0.56
1998 - Q1	10.19%	\$ 0.91	15.55%	\$ 0.94	23.38%	\$ 0.88	11.97%	\$ 0.53	29.51%	\$ 0.73
1998 - Q2	-27.46%	\$ 0.66	-28.25%	\$ 0.67	3.12%	\$ 0.90	-34.49%	\$ 0.35	1.60%	\$ 0.74
1998 - Q3	82.28%	\$ 1.20	96.25%	\$ 1.32	78.58%	\$ 1.61	54.98%	\$ 0.54	84.57%	\$ 1.36
1998 - Q4	26.25%	\$ 1.51	77.89%	\$ 2.35	8.09%	\$ 1.74	0.25%	\$ 0.54	-9.48%	\$ 1.23
1999 - Q1	10.97%	\$ 1.68	21.16%	\$ 2.85	25.88%	\$ 2.19	20.90%	\$ 0.65	30.97%	\$ 1.61
1999 - Q2	2.94%	\$ 1.73	9.77%	\$ 3.13	6.53%	\$ 2.34	19.63%	\$ 0.78	8.57%	\$ 1.75
Average Total Return	9.21%		13.30%		10.33%		4.94%		10.74%	

Using a simply MCAP to Sales ratio to sort yields the highest return

[Click here for spreadsheet used in analysis](#)