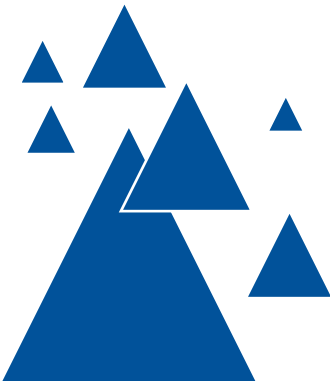


THE
INSTITUTE OF
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OF SCOTLAND



The Boys in the Bubble: Searching for Intangible Value in Internet Stocks

Researcher: William Forbes



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OREWORD

This report studies the internet boom in the late 1990s and its subsequent collapse in 2000. The dissemination of internet access was an enormous societal and economic change, and this industry continues to be an innovator of new ideas, with current developments such as YouTube, Facebook and MySpace. The debate on how to value internet businesses continues and this report seeks to further knowledge in this area by studying two possible sources of intangible value for Internet firms – web site popularity and the retention of the founding entrepreneur.

The report undermines the claim that web traffic is a useful valuation technique and predictor of future revenues and finds that the retention of a founding entrepreneur after the initial public offering can adversely affect firm value. This raises interesting questions for the wider business community as to whether the skills of entrepreneurs lend themselves to the ongoing management of businesses.

This project was funded by the Scottish Accountancy Trust for Education and Research (SATER). The Research Committee of The Institute of Chartered Accountants of Scotland (ICAS) has also been happy to support this project. The Committee recognises that the views expressed do not necessarily represent those of ICAS itself, but hopes that the project will contribute to understanding of intangible value in internet firms.

David Spence
Convener of ICAS Research Committee
January 2008

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E

EXECUTIVE SUMMARY

The Internet boom has now entered folklore as a speculative bubble on a massive scale. Throughout the late 1990s the dissemination of Internet access was seen as harbinger of an enormous societal and economic change, a new 'weightless' economy in which the sky was the limit for productivity and wealth.

In the subsequent stock market collapse, consultants and many academics lost interest in isolating and measuring the 'intangible' sources of value that had been used to justify the stock market values of Internet firms. The current report returns to this theme in the belief that while the stock market bubble has burst for the new economy its economic and social significance has not, and will not, go away. Indeed the recent stock market decline of the Internet sector might be seen as part of its maturation. As high profits to early innovators drew attention and attracted new entrants, the wealth created by the industry has now been re-allocated away from producers to consumers.

This report searches for intangible value amongst Internet stocks and, in particular, two possible sources of intangible value for Internet firms are examined:

- the visibility of a host's site, or the number of 'eyeballs' visiting a site and hopefully buying from it; and
- the retention of the founding entrepreneur whose vision gave birth to a site.

This report looks at the value of on-line visibility in the UK and the value of retaining the founding entrepreneur for a sample of US firms. The first chapter discusses the applicability and implications of

the 'winner-takes-all' business model in the UK market (Hand, 2003). It was this model that resulted in the huge losses made by Internet ventures appearing acceptable because of the need to grab market share and so to assure the viability of the business. The report also provides some stories of E-entrepreneurs as a way of illustrating their centrality to Internet ventures and the mechanisms by which they added value.

Host site visibility and Internet stock value

Web-traffic, or visits to host sites, is highly concentrated in the UK. This study uses data from Jupiter Media Metrix for the calendar year 2000 to investigate the degree of concentration of website visits. Just 100 sites attracted more than two-thirds of all estimated web-traffic each month in the year 2000 and the four hundred most popular sites accounted for over 90% of all traffic. Despite this concentration of web-traffic, only a minority of sites experienced persistent popularity. However, this report shows that, while popularity is rarely persistent in the UK, this fact is not well understood by investors and is so poorly reflected in Internet stock values. The study provides evidence of transient returns to being a popular site. Yet there appears no evidence of a premium, and some evidence of a discount, to being a persistently popular site. This finding somewhat undermines the claims made by both business consultants and academics that web-traffic constituted a more reliable financial performance metric than traditional accounting-based measures such as earnings and book value. The proposed benefit of web-traffic as a valuation yardstick presumably derived from its ability to predict future revenues to the host of the site and hence future profits. But if web-traffic could not be predicted with any regularity, then its usage as a valuation technique should have been in doubt. The failure to uncover a systematic relationship between consistently high streams of web-traffic and Internet stock returns may be due to many other factors not studied here. These may include business alliances with web-portals, such as AOL

and Yahoo!, and leading E-tailers such as Amazon.com and eBay. Internet access and use is an inherently social activity where it is considered that first mover advantages, lock-in effects and cross-fertilisations abound. Thus, the search for a summary 'number' that indicated performance may have been misplaced.

The founding entrepreneur and Internet stock value

A major part of the entertainment value of the Internet boom was the swathe of larger than life characters it threw up. College drop-outs, too 'geekish' to be rock stars, could, in a brief window of opportunity, log on, launch an initial public offering and retire rich at 30. Each Internet venture in many ways constitutes a bundle of intangibles, with patents and brand positioning often being the only clear assets. In such conditions there is clearly a role for a face to make these intangible assets congeal into a viable firm. Familiarity breeds investment and the presence of a captivating entrepreneur can be crucial to the success of an Internet venture.

Chapter three of the report looks at three examples of E-entrepreneurs, Steve Case of AOL, Pierre Omidyar of eBay and Ernst Malmsten of Boo.com. It does so using the stream of popular literature which sprouted up in response to the Internet boom, much of it in the form of uncritical biographies and autobiographies. While these three men fared with different degrees of success, each share some important characteristics. The first is an ability to combine great personal creativity and initiative with continuous networking and a desire to achieve consensus on key organisational goals. More than anything these individuals were survivors, capable of enduring an unusually high degree of uncertainty regarding both personal and corporate well-being. Interestingly, none of the three examples now remain with the company they founded. Whatever value they brought to the enterprise was clearly not judged as being central to their creation's longer-term survival.

The anecdotal evidence sets the background for the empirical study of the impact of retaining the founding entrepreneur upon firm value. For this study, a sample of 50 'pure-play' Internet firms in the US is used. The effect of the retention of the founder on company value by reference to stock prices alone is not used, but the Entrepreneur's valuation impact is measured using two traditional accounting metrics, earnings and book value. While stock price measures of Internet firm value may be dismissed as 'irrational', the same cannot so easily be said of accounting measures of performance. Regardless of the performance metric used, the results clearly suggest that retention of the founding entrepreneur after the initial public offering adversely affected firm value, or at least added no value. This concurs with research which suggests that new start-ups follow a trajectory from high uncertainty/high profit to low uncertainty/low profit as they grow. The ability to handle uncertainty, so vital in the start up phase, is dismissed by financial markets in favour of a more risk-averse style of management later on.

1 INTRODUCTION

This chapter sets the scene for the debate over the correct way to value Internet stocks. It provides some basic history of the bubble, as well as a rationale for its occurrence. Throughout, an evolution rather than revolution in valuation techniques, is emphasised and the continuing problem of isolating and measuring sources of value is stressed. Recent indications that a minority of viable steady companies have survived the elation of the late 1990s are also discussed. This suggests that the topic of the report may be of more than just historic interest.

The Internet boom/bust of the late 1990s-early 2000 is now often painted as a financial scam, or 'dot.con' on a vast scale (Cassidy, 2002). Yet, at the time, much was made of the need to adopt new business models that were capable of recognising the intangible, but nevertheless 'real', value of Internet start-ups. In the longer-run, it may be seen as part of a tumultuous 'creative destruction' analogous to the early railroad speculative bubbles in the US. However, the Internet shakeout of 2000 may presage the full emergence of the 'New Economy' in the remainder of this century.

The explosive rise of the search engine Google's share price suggests that 'web 2.0' is well underway as an Internet stock analyst of the original Internet boom recently wrote:

By all appearances the Internet industry is now in the early years of a long boom. The companies that survived the bust (Yahoo, eBay, Amazon, Google, et al.) should be able to enjoy several decades of above average growth. (Blodget, 2005)

One irony of the popular commentary on the ‘dot-com madness’ of the late 1990s is that the events of that period can easily be accounted for by a standard competitive analysis. Early innovators, both entrepreneurs and employees captured much of the wealth created in the form of producer surplus in share-options and initial public offering premia. As the market matured, market entry and competition re-allocated the wealth created by the Internet economy to consumers in the form of lower prices and better product choice.

Siegal (2005) noted that the ‘growth trap’ implied by the rapid growth in the market value of a sector did not imply strong investor returns. In fact increases in market-value of constituents in the S&P 500 explain less than a third of the total return to investors. The remaining return is driven by dividend payments and the emergence of new firms. Such new iconic forms are often overpriced by the time they attract much investor attention, such as companies like Worldcom and Telewest.

This report focuses on the effect of two elements of value for Internet start-ups: the web-traffic to a host’s site; and the retention of the founding entrepreneur within the company. The report critically evaluates these new business models in the light of the history of the recent Internet stock bubble and its rapid depletion in early 2000.

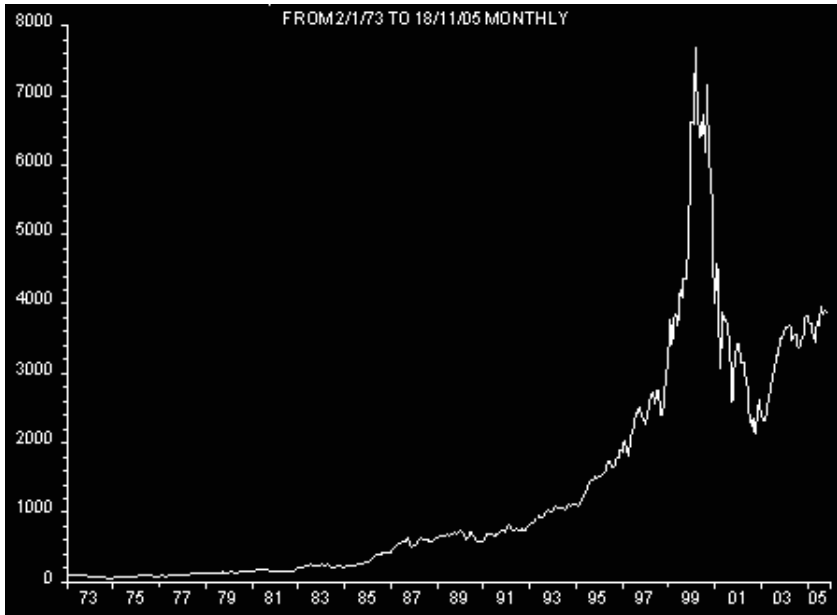
The Internet stock boom in the UK and the US: A brief history

Around the middle of 1999 the stock prices of UK Internet start-ups soared to dizzy heights. This explosion of stock-prices mimicked a sharp, but more gradual rise in stock prices in the US for similar firms since the spring of 1998 (see Figures 1.1 and 1.2).

Since the market peak in March/April 2000 the whole UK equity market lost £778 billion’s worth of value in the two subsequent years. The US market, in the same period, shed some £2,260 billion. However, this is not a complete assessment of the scale of the losses involved in

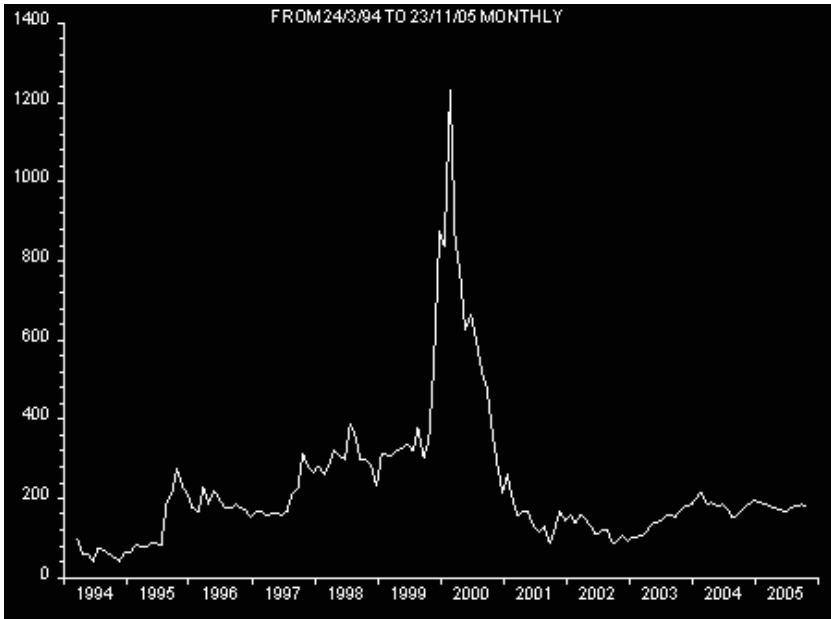
the Internet bust of the last few years, because a lot of the funding for Internet ventures was by means of syndicated debt with Telecom companies that alone defaulted on £60 billion worth of debt in 2000, according to a report by Moodys. The decline in value has recently started to be reversed as Figures 1.1 and 1.2 make clear.

Figure 1.1 NASDAQ Composite - Total Return Index



Source: Data Stream (Thompson International)

Figure 1.2 Europe - Datastream Internet - Price Index



Source: Datastream (Thompson International)

The Internet boom was surprising at the time, given the lack of profits for this set of firms. Indeed, many Internet start-ups seemed to view their ‘burn rates of investors’ cash with pride. At the boom’s height Amazon.com the on-line bookstore reported an annual loss of 11 cents per-share, yet had a market value of over \$ 5 billion and a market to book ratio over 50. Higson and Briginshaw (2000) give some examples of the sort of ludicrous relative valuations that characterised the boom era. In February 2000 priceline.com, an on-line auction site for airline tickets, hit a market valuation of \$7.5 billion dollars. Priceline lost \$142m on revenues of \$313m in the first few months of its operation. Priceline’s market value implied it was worth more than American Airways and

Continental Airways put together. Given its performance and lack of any discernable asset base, this value stretched credibility to breaking point. Nor were these extraordinary valuations restricted to the US market. In February 1999 Whitbread, the brewer, was knocked out of the UK FTSE 100 by Baltimore Technologies. Baltimore is an E-security company specialising in key infrastructure, particularly exploiting encrypted communications technologies. Baltimore's market value had risen from £78m to £4 billion in the previous year alone.

Valuations such as these, and equally extreme ones for @Home and eToys, made Taffler and Tuckett (2005) regard Internet stocks as:

...fantasy objects that allow us to return to the early stages of emotional and psychic development and associated unconscious feelings of magic power and omnipotence.

Yet, at the time of the bubble's emergence, new ways were advanced to explain the attractiveness of such stocks. A number of well-documented psychological biases may have led to dot.com ventures being valued differently from accepted valuation techniques.

- The availability and salience of good news about dot.coms. For example, dramatic appreciations in prices after a few well-publicised dot.com Initial Public Offerings (IPOs) caused investors to underweight poor post-IPO performance for most stocks. Similarly merchant banks advanced valuations based on wild extrapolations of past sales for E-tailers, allowing eBay to outstrip Toy's R Us, despite having only 1/200th of its rival's sales. The vividness of the experience with IPOs such as eBay, Netscape, or Amazon, may have been used as guidelines for later imitators, who were unlikely to have similar success to these path-breaking corporations.
- Herding meant that there was peer pressure not to 'miss-out' on the action, especially if large placement fees were payable to the

financial institution undertaking the IPO. Notions of objective truth often took a backseat to salesmanship in some investment adviser's minds.

In the aftermath of the Internet boom, Salomon Smith Barney's Telecom analyst Jack Grubman and Merrill Lynch Internet stock analyst Henry Blodget (mentioned at the start of this report) were banned from the securities business for life as part of a \$1.4bn out of court settlement by ten US investment houses with out-of-pocket investors that were engulfed by the sudden collapse of the market in early 2000.

As Internet stocks soared to new heights investors and analysts struggled to make sense of how companies, which seemed to do little but lose money, could be worth so much. Mary Meeker was a leading Internet stock analyst employed by Morgan Stanley and was one of the few central market players to show any reticence about dot.com valuations as the market bubbled over. Meeker survived a two year Securities Exchange Commission (SEC) investigation into her role in various IPOs, and calculated that she had cost her employer roughly a billion dollars on fees from deals on which she had exercised her 'analyst veto' (Gasparano, 2005). Nevertheless, the independent research function of analysts was largely transduced. For example, Grubman, who worked at Salomons, argued that sitting on the boards of the companies that he covered, like Worldcom, actually enhanced the insights that he was able to share with clients.

At the time of the late 1990s bubble, the dominant strategies for industry value and the key value drivers of competitive advantage for Internet firms were: popularity; and a strong founding entrepreneur within the firm.

These constituted two elements of a process of 'branding', and rendered marketable, the intangible value of Internet start ups.

The four ages of the new economy

An influential Internet report issued by Meeks, DePuy and colleagues at Morgan Stanley in February 1996, and written in the 'Iron age' of Internet access, envisaged the 'Golden age' of the Internet with a fusion of information technologies into a holistic interactive media, that would integrate content, computing and communication between both users and commercial enterprises (Tapscott, 1995). Many of the companies, discussed below, such as AOL Time-Warner, eBay, and Boo.com stand at the intersection of these disparate technologies.

Illustrative of this new age was the offering by Comcast in the US, and NTL in the UK, of the 'triple-play bundle' of Internet, television and telephone access to customers. An *Economist* article (Economist, July 30th, 2003) quotes Lee Ann Champion an executive at SBC the largest of the 'Baby Bells' formed out of Bell Laboratories as follows:

*We're not a telephone company any more: I sort of resent that.....
We're a communications and entertainment company.*

At the time, two emerging technologies were:

- Internet protocol television (IPTV), which allowed viewers - especially the young - to 'cut the wire' and downstream their chosen programmes for viewing at will, and may have been a desperate bid by the telecommunications sector to revive their fast disappearing markets. Access to all forms of communication via one reliable 'pipe' may have been very attractive, but it was extremely expensive to deliver.
- Voice over Internet protocol (VOIP), Internet telephony, popularised by Skype, which now has 53 million users world-wide. The recent acquisition of Skype by eBay for \$2.6bn is the most dramatic example of how Internet alliances are seen as the key to

survival in a slimmed-down post-bubble world. For example, the cover story of *The Economist* on 17th September 2005, was entitled 'How the Internet killed the phone business'. This article regarded those under the most threat as being mobile phone companies, who would struggle to get consumers to pay for products that others were giving away almost for free. Strangely old 'land line' based telephone companies, like BT and Duetche Telekom may have less to fear, as they can simply appropriate the new, lower cost, technology and derive revenue from premium service add-ons, information services, call forwarding and data storage. Ranking telecom companies by the percentage of their revenues derived from voice transmission China Mobile and Vodaphone appear in the mid-80% range, while BT only earns 30% of its current revenues from voice transmission. The higher the extent of exposure to voice transmission the more difficult the transition into a VOIP enabled world is likely to be.

The Meeks and DePuy report of 1996 envisaged four characteristics of the 'golden age':

- the integration of content and access, via video downstream and speedy web-access;
- a willingness to pay for advertising on the web;
- web-access to become ubiquitous at home and work; and
- greater interaction in web-access and the growth of web-based 'communities';

Stross (2000) reports that Bob Kagle of Benchmark Capital exclaimed in relation to Webvan:

Its like the 1840's railroads. What I'm seeing right now is an environment where every company you fund will have a dozen well-capitalised competitors.

Like the 19th century railroad companies (see Chandler (1977) for a review of the relevant historical issues) secular growth in the Internet sector would be disruptive, jarring, but progressive. The collapsed Internet ventures, which imploded at the expiry of the Internet boom, may be seen in retrospect as 'fireflies before the storm' in IBM's Louis Gerstner's phrase (Kanter, 2001), and those that survived the storm would form the key players of the new economy. But these new market leaders would have to share the wealth created by their Internet ventures more equally with consumers than early 19th century innovators (Miller, 2003).

New economy or old economy in a new bottle?

In reality the 'new' economy turned out to be just the old one in a new bottle where corporate strategies for success in E-business were just variants of those already deployed in earlier industries (Shapiro and Varian, 1999).

The first was price discrimination, often practiced by means of different versions of an on-line service. Illustrative of this is the provision of 'real-time' financial data by Reuters for market professionals, and a cheaper alternative service, providing the same data, but with a time-delay. This strategy has already been perfected by Airline companies that segment their market into business passengers and tourists.

Second was retaining the value of intellectual property, even in the face of dramatic declines in the cost of reproduction and distribution costs. For example, digital technology allows near perfect copies of most media to be distributed at almost zero cost. The rise of Napster, the creation of Steve Fawning, illustrated this trend. Napster allowed the widespread dissemination of MP3 music files containing pop/rock

music on a world-wide basis. To become part of this service, would-be members provided some new item to the bank of music files and, having done so, they were free to download other contributors' files at will. While Napster was forced into liquidation by litigation, its successors continue to thrive, for example, KazAa in the Netherlands. Although ease of replication is often interpreted as a threat to intellectual property, it may also serve to stimulate demand for the underlying product. Relaxing the rights of investors increases potential demand, but also leads to price discounting. This trade-off is similar to the public discontent following the dissemination of the printing presses where the impact of technical progress eroded producer rents. That erosion motivated the objection rather than the harmful effects of the technology as such.

Third there is the 'lock in' to proprietary technology in the form of access to, or usage of, the Web. Illustrative of this is the refusal of AOL to auto-forward emails to former subscribers. Such an attempt to extract a premium price out of consumers reliant on a service is reminiscent of the attempts by BT to oppose telephone number portability, despite the ease of technically implementing this service. The new Communications Act 2003 extends portability to the mobile phone market.

The fourth pricing strategy is product 'bundling', the most visible example being the 'browser war' between Netscape and Microsoft. While this legal dispute reached fantastic proportions, the basic bundling strategy will be familiar to parents who take their children for a 'happy meal' at MacDonald's, where the burger comes bundled with fries, a drink and that most essential ingredient, the toy.

Are we in the 'golden age' of web-access?

The Internet economy today bears out most of the key predictions of the Meeks/DePuy report. At the end of 2001, a total of 144.4 million Europeans, including citizens of countries from Albania to the UK, were using the Internet at least monthly according to a report by the

International Telecommunications Union (ITU) (Table 1.1). Four of the European countries - Germany, the UK, Italy and France - comprise 63% of Europe's Internet users. Because of their sparser populations, the Nordic countries have far fewer Internet users despite having seen early and wide-spread adoption of information and communication technologies. Poland and Russia remain the largest Internet markets in Eastern Europe, although only a small percentage of Poles and Russians are online.

Over time the Internet user market is showing considerable signs of maturing. A recent Jupiter Research report classifies users in various groups by tenure of active web-usage:

- 'Intermediates' have between one and two years online tenure;
- 'Newbies' have less than one year online tenure.
- 'Net Vets' have between two and five years online tenure; and
- 'Super Net Vets' have five or more years online tenure.

Table 1.1 Online population by tenure

Country	Newbies	Intermediate	Net Vets	Super Net Vets
Sweden 2002:	5%	8%	59%	28%
2007 projected	2%	3%	10%	85%
US 2002:	10%	11%	41%	38%
2007 projected	4%	5%	19%	72%
UK 2002:	12%	13%	49%	26%
2007 projected	3%	4%	18%	76%
Germany 2002:	12%	21%	54%	13%
2007 projected	3%	4%	21%	72%
France 2002:	10%	18%	51%	10%
2007 projected	7%	8%	30%	56%
Spain 2002:	24%	19%	38%	18%
2007 projected	8%	8%	28%	57%
Italy 2002:	20%	20%	53%	6%
2007 projected	3%	5%	26%	66%

Sweden has the 'web-savviest' on-line community with 28% of users already having five-years of experience, with this proportion projected to rise to 85% by 2007. But other European countries lag far behind with France and Italy having 10% or less users with more than five-years experience. The clear trend is towards a sophisticated, experienced, web-based community with the vast potential for commerce, education, civic life and social interaction more generally.

In the year ending 2002, in the US E-tailing sales revenue was growing at between 30 and 40%, compared to off-line sales of 4% on average. A survey (www.nua.com) places global worldwide Internet usage

at over 600 million, with 31.5% of users residing in Europe, 30.1% in North America, while only 1% of users worldwide reside in Africa. Even with such strong penetration, the growth rate of E-commerce remains buoyant. Neilson Netratings recorded a 44% increase in online-purchases in the US during Christmas 2002. In the UK, digital media entered a frenzy with 125 million text messages being sent to greet the New Year in 2003, according to the Mobile Data Association (twice the daily average).

Table 1.2 Data on internet usage

Country	Internet users	Date of measurement
World	604,111,719	2004
European Union	206,032,067	2004
United States	159,000,000	2002
China	94,000,000	2004
Japan	57,200,000	2002
Germany	39,000,000	2003
South Korea	29,220,000	2003
United Kingdom	25,000,000	2002
France	21,900,000	2003
Italy	18,500,000	2003
India	18,481,000	2003
Canada	16,110,000	2002
Brazil	14,300,000	2002
Taiwan	13,800,000	2005
Mexico	10,033,000	2002
Spain	9,789,000	2003
Australia	9,472,000	2002

Table 1.2 Data on internet usage (Continued)

Country	Internet users	Date of measurement
Poland	8,970,000	2003
Malaysia	8,692,100	2003
Netherlands	8,500,000	2003
Indonesia	8,000,000	2002
Thailand	6,971,500	2003
Russia	6,000,000	2002

Source: CIA World Factbook (URL <http://www.odci.gov/cia/publications/factbook/rankorder/2153rank.html>)

Among Europe's four Internet powerhouses, Germany is likely to remain ahead, closely followed by the UK. The Nordic countries are predicted to continue to have the fewest number of Internet users in the region by virtue of their small populations. Some Eastern European countries, like Slovenia and Estonia, have made great advances in adopting computers. Nevertheless, in the use of both cellular phones and the Internet, much of the East remains grossly underserved by information technology, with country-wide Internet user populations generally below one million.

The web also constitutes a relatively small, but fast growing, advertising outlet for UK companies. The Advertising Association is predicting a 40% growth rate in advertising for 2005-2006 (Table 1.3).

Table 1.3 Net spending on advertising as proportion of total (£m)

Medium	2000	2001	2002	2003	2004	2005	2006 (E)	2007 (E)
Internet	1.2	1.4	1.6	2.9	4.5	5.7	6.3	6.9
TV	31.4	29.7	31	30.4	30.2	29.9	29.9	29.9
Press	40.2	41.1	40.3	39.8	38.9	38.3	37.8	37.3
% of total	3.30%	4.03%	4.44%	8.19%	12.78%	16.33%	18.05%	19.77%

Notes: E = estimated

Source: Zenith Optimedia (Connon, 2005)

Recent acquisitions appear to confirm that a big push to bolster web presence is underway, with ITV's £170m bid for Friends Reunited and Trinity Mirror group's acquisition of Hotgroup (a job search site) for £80m, illustrating this trend (Table 1.4). So while dot.com companies have disappeared from the UK market, a healthy market in the acquisition of private companies remains. It is in this private sector, where the guidance of a quoted price is denied, that the valuation issues discussed in this report will often be most vital.

Table 1.4 Recent UK media group acquisitions in Internet sector

Deal	Value
ITV / Friends Reunited	£170m
Trinity Mirror / Hotgroup	£50.5m
EMAP / World Global Style Network	£140m
DMGT / Jobsite	£36m
B Sky B / Easynet	£211m

The growth of Internet access

The dissemination of instant communication technology has similarly been stunning, especially text messages on mobile phones. Illustrative of the trend towards the use of the interactive nature of web-access and communication is the recent BBC national IQ test 'Test the Nation'. More than nine million viewers undertook the test interactively via a digital television link, an exercise in mass observation almost unimaginable until recently.

The dissemination and usage of the Internet has been greatly enhanced by the appearance of 'broadband' access, which comes in two primary forms:

- **ADSL - Asymmetric Digital Subscriber Line** - This uses a copper wire between a house and a phone company's exchange, with ADSL modems at either end. This set-up can carry data up to 10 times faster than a 56K narrowband connection. But ADSL can only reliably be accessed 5.5 km away from the local exchange. ADSL uses the copper cable that is installed by BT to provide a phone service. BT provides an ADSL broadband service through its exchanges and lines. So if a third party wishes to sell ADSL, it will be using BT equipment. This process remains fairly costly and is one reason why ADSL is still fairly expensive.
- **Cable** - This uses the same line that brings TV and telephone signals into the home. The cable can carry hundreds of megahertz (Mhz) of bandwidth, while each TV channel only needs six MHz. The extra bandwidth is used to connect to the Internet. However, this bandwidth is shared with anyone else using the same cable Internet service in a local area. So, the connection speed slows down if lots of people are on the Net. To access it, cable has to be laid locally and it must be Internet enabled. This is expensive for the company to install, so not all areas have a cable connection yet. With one of the two major cable companies, NTL, in financial trouble, the spread of cable access is still slow. Telewest, the other principal

more successful provider, is currently collaborating with NTL to purchase Premiership television rights and offer video-on-demand. This proliferation is likely to grow following the EU's decision to break B Sky B's monopoly on the screening of Premiership football in the UK.

After a slow start it would appear that Britain is joining the enthusiasm for broadband expressed elsewhere in Europe. Over a million UK homes and businesses are now operating on an ADSL connection, paying over £20 per month. This level of penetration will increase, as the Government committed itself to giving all School, Universities, and Doctors' surgeries full Internet access by 2006. This goes some way towards fulfilling the Meeks/DePuy prophecy of the Internet as a basis for new communities. An example of such community in the age of the 'wired world' comes in the usage of sites such as www.ssrn.com by academics to access the working papers of colleagues throughout the world, or LEXIS for searching out case precedents by lawyers.

By 2008, the number of broadband connections is predicted by Jupiter research to have risen to 47.2 million, or 28% of the population. However, the rate of broadband adoption varies significantly across Europe. The highest rates are in the technologically sophisticated Nordic region; the lowest in southern Europe. Besides supply-side issues such as cost and availability, these disparities can be explained by the varying levels of online tenure and technological sophistication in various regions. For example, Sweden, with a broadband household penetration of 16%, has a technically literate online population with high online tenure. Conversely, Spain's online population had lower tenure overall and broadband penetration of just 8% in 2002.

Thus, with all these constituencies of users, there appears to be considerable scope for growth in online advertising, with US advertisers taking in \$1.47 billion for the third quarter of 2002. However, total Internet advertising revenues in Europe only grew by 2% in 2002, accounting for just over €1 billion according to Jupiter Research. Growing understanding of the Internet's benefits, such as cost-efficiency

and accountability, have resulted in many advertisers maintaining, or even increasing, their spending on online initiatives. Nevertheless, the long-term viability of the Internet as an advertising medium remains strong, and by 2008, it is estimated that total Internet advertising spending in Europe will reach €4 billion, representing 4.5% of total advertising spending.

Research method

A mixture of research methods is used to investigate the origin and management of intangible values in the Internet sector. In chapters two and three, literary archival sources, often in the form of popular literature, biographies and business best-sellers, have been used to give some qualitative indications of value of these new-economy ventures. In chapters four and five, recourse is made to more formal quantitative research techniques for valuation, as popularised by 'market-based' accounting researchers, to draw a link between the traded share price of these companies and traditional accounting value metrics, such as earnings and book value. Such a perspective is of interest because it is this relationship which so obviously uncoupled, or at least became re-defined, during the height of the Internet boom. The final chapter provides insights into the creation and management of intangible value in the Internet sector.

Summary

This chapter described the basic facts of the Internet and the dot.com bubble and its implosion. At the time of the bubble, extraordinary stock values were justified by pointing to the emergence of new, currently largely unmeasured, sources of value. The Internet was seen as an ubiquitous force for social and economic transformation. Hence, there were calls for the recognition of non-accounting based sources of value in the new economy, to measure the intangible value in Internet ventures. This report examines how this was done.

2 DOES THE WINNER TAKE ALL?

Introduction

This chapter discusses some of the ex-post rationalisations of the surge in Internet stock prices offered by academics, and considers the primary rationale offered by business analysts at the time; the ‘winner-takes-all’ business model.

The Internet boom spawned a whole new set of valuation methods (Bartov *et al.*, 2002; Kozberg, 2001). This chapter focuses upon just one such model - the ‘winner-takes-all’ strategy of grabbing market share at all cost as a means of pre-empting market entry by competitors. To achieve this, the distribution of web-traffic data is portrayed, together with how it evolved during the last stages of the Internet boom in the UK. Chapter four attempts to relate patterns in web-traffic to financial performance for the hosts of competing sites. This chapter asks whether the ‘winner-takes-all’ philosophy manifested itself in the UK Internet market, where winning was meant to attract large amounts of web-traffic to the site.

The winner-takes-all model

The ‘winner-takes-all’ business model of Internet venture success can be best summed up by the Amazon logo ‘Get Big Fast’. The corporate objective was to achieve maximum growth (‘hits’ to the site, or revenue) with a view to ‘killing the opposition on the ground’. More specifically, in terms of corporate valuation, it implied that an Internet venture’s stock price increased with the scale of its advertising and marketing

expenditure, regardless of the impact on the short-run profitability of the firm. Hand (2001) presents results to suggest that Internet firm losses were positively priced by the market. This may have been because such losses were regarded as investments necessary for success in a new Internet venture. Under US GAAP expenditure on intangibles is expensed, and not capitalised and then amortised, like many other forms of investments. Prior studies show that other investments which are expensed under US GAAP also result in a positive response by the stock market (McConnell and Muscarella, 1985).

A primary driver of the 'winner-takes-all' nature of Internet competition is the self-fulfilling nature of consumer expectations regarding the benefits of adopting alternative modes of access (e.g. AOL vs Compuserve, cable versus ADSL). Adoption of any given mode of access creates an adoption externality, when other users benefit from the enlargement of the pool of users of their chosen mode of communication.

So choosing a broadband access technology affects not only the user's own experience of using the web, but also determines who they interact with and the ease of that interaction. Knowing this, when buying into a new technology, consumers implicitly take a gamble on which system will eventually predominate. The instability of such conjectures can lead to the ubiquitous adoption of an arguably inferior, yet widespread, technological solution. Illustrative of this is the adoption of Mashushita/JHS's VHS, rather than Sony's Betamax video technology in the 1980's (see Rohlf, 2001).

The dynamics of market competition for adherents to the 'winner-takes-all' strategy is investigated in Noe and Parker (2005). The key characteristic of such markets is the high fixed cost/low marginal cost of the product produced. Conditional on a decision to enter, it is optimal to play an aggressive strategy. Entrants advertise heavily to dominate the web space knowing that they face a highly skewed distribution of returns. For such bold entrants it is either death or victory with little possibility

of an intermediate outcome. As iterative rounds of competition weed out more timid/weaker players, the return to an aggressive saturation advertising strategy emerge. Given that current GAAP tends to expense advertising costs, it is inevitable that accounting earnings and economic performance will be inversely related.

Internet stocks as lottery tickets

The 'winner-takes-all' competitive strategy is usually portrayed as describing the investment behaviour of new entrants to any Internet space, retail, auctions, web-search, etc. But, recent research by Barberis and Huang (2005) drawing on psychological insights by Tversky and Kahneman (2000) suggest a somewhat analogous story describing the preferences of investors.

For some time it has been clear that experimental evidence has refuted the simplifying fiction that investors make their decision, in accordance with the standard postulates of expected utility. In particular, investment decisions seem to be characterised by risk-aversion in respect of possible gains, while being risk-loving in respect of potential losses. Hence, investors prefer one pound received for certain, to a 50% chance of winning two pounds and ten pence, but prefer a 50% chance of losing two pounds ten pence to losing a pound. This type of inflection of the investor's utility function around zero, plus other curiosa in respect of investors' attitudes to risk, has for some time been modelled by 'Prospect theory' (Kahneman and Tversky, 1979).

More recently, Tversky *et al.* (2000) have updated Prospect theory to capture the high value that decision-makers seem to give to extreme outcomes. It is this very preference which drives largely poor people to purchase lottery tickets, even though the price is less than the expected value of the ticket. This revised version of prospect theory introduces a weighting-function to the expected value calculation which expresses a strong preference for extremely high pay-offs, even if they occur

with extremely low probability. It's this very preference for a skewed distribution which might induce investors to indulge managers in their adoption of a 'winner-takes-all' strategy.

Why did accounting values and Internet stock prices disconnect?

Internet stock pricing has been assumed to be 'irrational' by most media and academic commentators. Higson and Briganshaw (2000), in their critical analysis of sky-high Internet market prices, suggested a four-step model for correctly valuing an Internet stock:

- estimate the potential future market size and predict the company's likely revenues;
- project the company's likely costs;
- forecast the company's asset needs; and
- check the forecast to ensure the predicted market share is reasonable. If super-normal profits are implied by the forecast make sure that the source of lasting competitive advantage is clear.

Applying this framework to Amazon in the US and Freeserve in the UK, Higson and Briganshaw (2000) concluded that the stock price valuations of these firms in early 2000 were almost certainly excessive compared to economic fundamentals. The authors suggested two reasons why such overvaluation might have occurred. First, there was a far too optimistic view about how competition would impact upon Internet ventures' margins. Analysts often seemed to ignore the rapid entry of rivals into new markets which would drive down prices for their services. Secondly, the naive claim that Internet ventures had 'gravity-

free' balance sheets, now appears largely unjustified. While it was true the new economy had far lower asset requirements, the extent to which this was the case was over-exaggerated. Amazon had net assets of -10% of sales in 1998; this was largely because customers ordered and paid for books before Amazon took them into inventory. But this illusion of an asset-free company was wiped out in 1999 once Amazon expanded its network of postage depots. Further, Internet companies' investments in intangible assets, intellectual property and patents were on a par with old economy investments in bricks and mortar.

Rationalisations offered for the Internet bubble

Isimbabi (2002) points to a number of factors that promoted the surge in Internet stock prices in the late 1990s. First, investors recognised that early entrants could dominate the Internet, and hence a few companies, such as Yahoo!, Amazon and eBay commanded extraordinarily high valuations. Second, because the competitive terrain and outcome of the new economy was so new, investors purchased a portfolio of Internet stocks, for fear of missing out on a minority of very lucrative investments. This reflected the impact of the 'winner-takes-all' valuations on key-players. Third, fund managers, who were benchmarked partly relative to Internet stocks, felt compelled to join the bubble almost regardless of their own views regarding the longer-term profitability and growth of this sector. Finally, the growth of on-line trading and a substantial fringe market of less well-informed investors led to a bubble.

Siegal (2005) argues that despite all the hype given to the technology, media and telecoms sector, or the 'new economy', in recent years the reality of investors' experience suggests the presence of a 'growth trap' in which investors typically overpay for trendy 'new economy' stocks. To illustrate this Siegal (2005) considers the investment performance of IBM against Standard Oil in the period 1950-2003. Both stocks

did very well. The total return, including dividends, of IBM over this period was 13.3% per year on average, but that of Standard Oil was 14.42%. Price appreciation was greater for IBM in the period, but IBM retained dividends for future investment, pulling down its total return. This example underlies a key point of wealth creation in the new economy. The Internet and the 'new economy' it helped create has, in all likelihood, created vast pools of wealth. But the wealth that the new-economy creates may not necessarily flow to investors in common stock, but rather to entrepreneurs, key employees, merchant banks and consumers.

Moon and Schwartz (2000) enter a dissenting note to this view in the context of the development of a continuous-time asset-pricing model. They argue that the volatility of growth in revenues is central to an understanding of Internet stock asset pricing. This is because, although limited liability limits the losses of equity shareholders at liquidation, the gains from increased revenue, if the site comes to dominate the space, are unbounded. So equity investors may reward start-ups that recklessly gamble on establishing enough brand recognition to drive out competing sites. Moon and Schwartz apply their model to Amazon.com in the late 1990s and conclude that observed prices were clearly in excess of reasonable projections of earnings growth. Nevertheless, they argue that some combinations of, admittedly extreme, growth assumptions, could be used to justify 'bubble like' expectations regarding US Internet stock prices.

A variant of the rational pricing argument, which locates the origin of the Internet bubble in the impact of short-sales constraints on market trading has recently emerged. Short-sales are the selling of shares in the hope that their price will fall. If successful, the trader sells at one price and later re-buys the shares at a lower price. Of course such short-selling is risky because of the possibility of price rises. Ofek and Richardson (2003) argue that pessimistic sentiment regarding future Internet pricing

was suppressed by an inability of investors to profit from selling Internet stocks short, because of legal restrictions such as lock-in periods.

Studying the period January 1998 to February 2000 in the US, the heart of the 'bubble', Ofek and Richardson (2003), point to the significance of the crescendo of shares released from their 'lock in' conditions, during the wave of Initial Public Offerings (IPOs) launched on the back of the 'New Economy' boom. Such 'lock ins' arose because IPOs typically only initially floated a 15-20% ownership stake in the company. The remainder of the stock was absorbed by the current owners, key employees, institutions involved in the float, or reserved for later offerings. Only after six-months or more were these insiders allowed to sell their stake. In the meantime they are said to be 'locked in'. Examining share price movements for Internet IPOs in the six months after the expiration of the 'lock in', the authors report an average underperformance of -13.8% relative to an index of Internet stocks.

E-entrepreneurs

It would appear that one of the primary motivators of the late 1990s glut of Internet firm IPOs was the desire to fund a rapid increase in market share, during a period when Internet commerce was still in formation. Schultz and Zaman (2001), in a study of the 321 Internet IPOs in the US, occurring in the interval January 1999 to March 2000, found little evidence that IPOs of late 1990s Internet start-ups were like a classic bubble, with owners selling out early to gullible outside investors.

However, the surface evidence for irrational pricing of the sample of IPOs studied is indeed dramatic. The 299 publicly traded companies in their sample made a combined loss of \$4.95bn on revenues of \$8.2bn. Schulz and Zaman (2001) argue that Internet entrepreneurs undertook IPOs to fund what they saw as unparalleled opportunities in the sector,

to grab market share at a formative stage of the market, for example, Jeff Bezos of Amazon stated:

...there's so much Internet opportunity that now is the time to invest. We're trying to make all of our decisions in a long-term context (Spector, 2000).

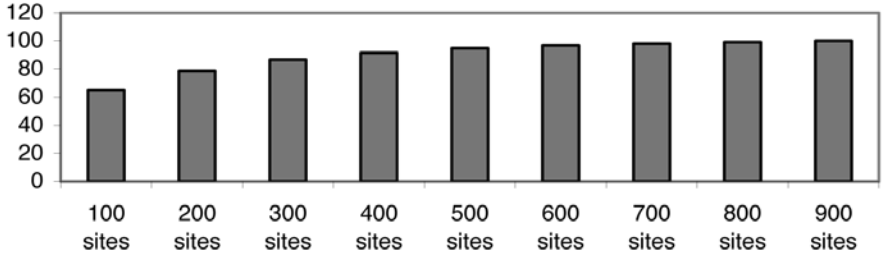
Such a desire to grab as much market share as possible might have made sense if strong economies of scale had existed in the provision of web-based services, as shown by eBay. eBay, once it had its basic auction software in place, began its exponential growth with little extra expenditure, making it profitable almost from day one (see Stross, 2000).

Schultz and Zaman (2001) report that entrepreneurs of Internet firms retain a higher percentage of their firm's equity than non-Internet concerns of comparable size in the years. Even when the authors looked at subsequent seasoned offerings, which were less frequent in Internet firms anyway, no clear evidence of a greater proclivity of Internet entrepreneurs to sell out, compared to their non-Internet counterparts, was not found. The importance attributed to grabbing market share quickly was not just one uncovered by academics. Rather it formed the basis of the 'Get Big Fast' doctrine of Jeff Bezos at Amazon and David Beirne's requirement that his prospective venture capital clients at the Benchmark fund 'Go Big or Go home', which is discussed at the end of this chapter.

The concentration of web-traffic in the UK

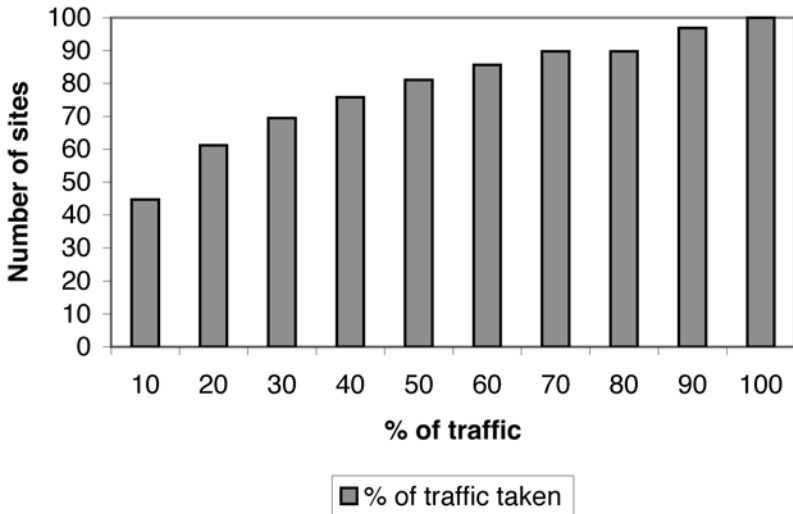
The most striking reason for the 'winner-take-all' nature of the Internet ventures was the sheer degree of concentration in the markets that they served. Of the 916 sites accessed in the UK, appearing in the Jupiter MMXI database of web-traffic in the year 2000, the most popular 100 sites attracted 64.75% of all traffic, while the top 400 accounted for over 90% of all traffic (see Figure 2.1).

Figure 2.1 Proportion of Jupiter MMXI 2000 web-traffic data attributable to most popular 100, 200, etc. sites



Even within the 100 most populous sites, the extent of concentration is evident (see Figure 2.2). For the 100 most popular sites, 44.66% of all traffic is accounted for by the 10 most popular sites (the first column in Figure 2.2) and over 80% of the traffic is attracted by the 50 most popular sites (the fifth column in Figure 2.2).

Figure 2.2 Plot of distribution of Jupiter MMXI web-traffic data for top 100 sites



A Case study illustration: Dave Beirne at Benchmark and the launch of Webvan.com

The enthusiasm for dramatic domination of the Web was encouraged by venture capital firms who guided Internet start-ups towards their IPO. Illustrative of such an intent was the motto of David Beirne, at Benchmark Venture Capital to 'Go Big or Go home' (Stross, 2000). Perhaps no start-up illustrates the trend as well as Beirne's support of Louis Border, of Border's bookstore fame.

Louis Border sold out the bookstore he owned with his brother to K-mart in 1992 and tried to make use of his considerable wealth in various start-ups as an 'angel' investor. By the turn of the millennium Louis had started to think big with a project he initially entitled 'Mystore.com' an online department store which offered food, CDs, furniture, electrical goods, indeed, almost everything, via an online service called 'Webvan'. The Border family could easily afford the \$35m required to initially establish the business, if they chose to do so. But as he pointed out to the partners at Benchmark 'in order to attract the best people, you need to have the backing of winners. Its not the money' (Stross, 2000). Louis Border, ironically perhaps, did not accept the 'profits are bad' doctrine of Jeff Bezos and his ilk. He predicted his initial supply centre in Oakland, California, would be profitable within six months. However, this ambition created incredible pressure to roll-out the distribution network. To facilitate this, Webvan signed a \$1 billion construction contract with Bechtel, the US's largest construction firm. For the first of his local centres, where goods would be packed, Border was budgeting to raise \$33m, with an ambition to roll out over 500 such stores over time. Since Webvan posted a loss of \$33m in its first quarter, problems could have been expected to arise. Nevertheless at the IPO in the summer of 1999 Webvan was valued at \$8bn, roughly half the valuation of Safeway, a leading traditional retailer with a firm track record of profits and a countless number of branches in the US

and worldwide. A venture capitalist commented that Webvan was perhaps 'the Internet era's equivalent of Waterworld, a disaster so epic it becomes an American legend.' (Stross, 2000)

As such Webvan has become an icon of the degree of stock market folly during the height of the Internet bubble.

Summary

This chapter documented the sharp concentration of the UK market in Internet traffic. The UK market for Internet 'eyeballs' is persistently highly concentrated, both prior to, and following, the bubble in Internet stock prices. Internet services and commercial sites are highly branded in the same way as clothes or computing equipment. The 'winner-takes-all' doctrine for Internet success was actively propounded by a number of key players in the early days of the new-economy boom. Indeed this doctrine was seized on to make losing money seem almost virtuous. Investment was portrayed as a precondition of profits in a mature market for Internet services. The effect of this was to make accounting profits and book values seem like an erroneous measure of shareholder value. Once the 'winner-takes-all' doctrine was accepted as valid for a few pioneering firms, the use of comparative valuation metrics made its adoption more generally acceptable in the Internet sector. But since only a few winners could finally prevail, a more general application of the doctrine seemed doomed to failure. The 'winner-takes-all' justification of losses while perhaps justifiable for winners, soon found rhetorical application amongst all Internet start-ups. The role of web-traffic in determining Internet stock prices during the bubble is explored more formally in chapter four.

3 THE BOYS IN THE BUBBLE: SOME CASE STUDIES

One intriguing aspect of the Internet boom was the string of 'larger than life' characters that it produced as entrepreneurs. The Internet seemed to have a democratising and almost revolutionary effect upon the market for start-up capital. Suddenly university drop-outs could start a venture destined to make them billionaires from the comfort of their Hall of Residence. Jerry Yang and David Filo, co-founders of Yahoo!, reported that they were on a 'leave of absence from the Stanford University PhD program' in their corporate biographies provided to investors.

Jeff Bezos, founder of Amazon, had a successful career as a hedge-fund manager behind him when he founded Amazon, and started the venture in his garage to make its history more captivating. These new industrialists made an unlikely crew. As one venture capitalist quipped to Michael Lewis 'In what other age could a guy like Bill Gates be the most powerful man on earth?'.¹

This chapter exploits the presence of a wealth of corporate biographies and hagiographies to shed light of the nature and development of the entrepreneurs who founded successful Internet ventures. This chapter draws upon the history of four legends of the Internet economy: three successes - AOL, eBay, and Amazon; the other a spectacular failure - Boo.com (now being revived). The story of these founders are particularly easy to discuss because of the availability of a corporate biography of AOL and its founder Steve Case (Swisher, 1998), and a history of the unhappy marriage that is AOL Time-Warner (Klein, 2003), a history of eBay's formation (Cohen, 2003) and an insightful autobiography by Ernst Malmsten (Malmsten *et al.*, 2001) of his creation of Boo.com with Kajsa Leander (currently in production as a film by Working Title) and, finally Jeff Bezos (Spector, 2000) of Amazon. But these accounts

are simply part of whole literary genre emerging from the public's fascination with these colourful characters who mapped out the creation of web-based businesses. Other examples of the genre include Lewis (2000), Stross (2000) and Wolff (1998). Before focusing on particular entrepreneurs, however, some general traits of an entrepreneur capable of heading an Internet venture are discussed.

Internet entrepreneurs emerged in an era when the whole economy 'dematerialised', with human capital coming to the fore at the expense of physical capital (Zingales, 2000). As Zingales states:

Employees are not merely automata in charge of valuable operating assets, but valuable assets themselves, operating with commodity-like physical assets. (Zingales, 2000)

The emergence of a new economy heralded for some a new 'E-culture' which required a number of key strategies to maintain competitive advantage (see Kanter, 2001):

- more improvisation in response to the fluctuating conditions of both customer and supplier market conditions, as well as the progression of technology;
- partnerships to be nurtured from the moment of corporate inception, as opposed to becoming an alternative to organic growth;
- establishing a community that was central to relations with customers, suppliers and employees as the corporation's value was rendered increasingly intangible and so easily marketable;
- the capital asset base of production to be discounted to allow for intangible/knowledge-based value, correspondingly the market for the entrepreneurial, managerial and employee talent became

increasingly tight. The relative price of fixed physical assets, such as factories, machines, seemed likely to fall relative to that of intellectual property and key 'knowledge' workers within the new-economy enterprise; and

- crucially the difference between success and failure was determined by whether E-culture was a matter of style or substance for participants in the venture. Following the downturn of early 2000 a minority of ventures based on sound business principles still remain. In a conversation with Richard Turner a Catalyst Venture Capital partner, it became clear that the post 2000 period was more 'business as usual' with the bubble period being an aberration². In this report the role of accounting information in differentiating between these two types of Internet concerns is illuminated.

The characteristics of the newly emergent firm

The key characteristics of the newly emerging firm, where human capital took centre stage included:

- an increased intensity of worldwide competition with a surge in demand for process innovation and quality manufacture/service, that required skilled, educated staff, even at a relatively junior level;
- an individual firm's ability to configure human capital declined and increased access to venture financing meant that star employees would consider their own start-up prospects more intently. The opening up of world trade and corporate finance meant that independent suppliers were more plentiful and likely to offer attractive prices for their produce, opening up many more opportunities for ambitious/entrepreneurial employees;

- a breakdown in the vertically integrated firm had commenced, especially in the intermediate goods sector. As stronger competitors emerged, bench-marking revealed the full extent of corporate waste in larger and diversified organisations; and
- the need to effectively manage key human resources was not unique to Internet start-ups, having already been found highly problematic in research led biotechnology start-ups (see Lieberskind, 2000).

The making of an Internet entrepreneur

While the Internet changed the type of people receiving funding for business start-ups, it did not radically alter the traits required for launching a successful new venture. Bhidé (2000) conducted an extensive study into the origin and evolution of new businesses. This section draws on his path-breaking study for insights into the traits necessary for success as an Internet entrepreneur. Bhidé portrays businesses as lying along a potential profit/irreducible uncertainty continuum. Established corporations, such as BT, or Sainsbury's, lie at the low irreducible uncertainty and low potential profit end. Internet entrepreneurs lie at the other end, with a spectrum of possible commercial forms lying somewhere in the middle. Entrepreneurs in effect purchase a 'lottery ticket' offering a small probability of becoming seriously rich. As Bhidé (2000) argues we can imagine a company like Microsoft following the whole path from high irreducible uncertainty and high potential profit in 1975 in Bill Gate's garage to low irreducible uncertainty and low potential profit in 2006, as Microsoft battles to mitigate the impact of antitrust litigation.

Internet entrepreneurs faced a market with a high degree of irreducible uncertainty, but as a consequence faced few competitors and those they did face were likely to encounter the same capital constraints. Venture capitalists are unlikely to be attracted to untested technologies

being implemented largely by young and inexperienced entrepreneurs. It was only as the Internet boom gathered pace that venture capital firms, such as Click2think, expressed interest in the market. Prior to the entry of venture capital firms, young inexperienced entrepreneurs, with little to lose but youthful pride, faced each other on an equal footing. As Michael Dell put it:

*The opportunity seemed so attractive. I couldn't stay in school.
The risk was small. I could lose a year at college.*

The functions of entrepreneurship

Internet entrepreneurs fulfill many of the same functions as noted by classical economics; these include innovation, co-ordination, an ability to arbitrage and a willingness to bear a high degree of uncertainty.

One characteristic worthy of particular comment in relation to Internet entrepreneurs is what Bhide (2000) calls an:

...unusual tolerance for ambiguity... compared to founders of popular businesses [such as hairdressing or gardening].

Internet entrepreneurs faced great uncertainty in almost all dimensions of their business life, including technology, financing and the regulatory/legislative environment. Both AOL and Boo.com teetered repeatedly along the edge of failure, with Boo tripping over the edge in early 2000. Steve Case's tenacity was so legendary that AOL became dubbed 'the cockroach of the Net'. But the very turbulence and fluidity of the market for Internet services opened up opportunities for cross-supplier and inter-customer arbitrage. As Bhide (2000) states, profit derives from:

...buying inputs cheap from uninformed suppliers and selling them dear to uninformed customers.

Another key characteristic of successful entrepreneurs is opportunistic adaptation and responsiveness to customer need and the opening up of niche markets. For example, Hewlett Packard began with the production of an audio oscillator but limited demand pushed production towards printers and calculators, before, finally, entering the computer market. Each stage of the evolutionary path was traced by a response to customer need within a rapidly changing technological terrain.

The final, and possibly frustrating element of success for an aspiring entrepreneur is luck. With the window of opportunity being so narrow, every successful entrepreneur needs an element of luck. The four case studies, discussed below, illustrate the role of chance events in the development of the Internet enterprise.

Case Study One - Leander and Malmsten of Boo.com

The rapid rise and ignominious fall of Boo.com reveals many of the brutal demands on the would be E-entrepreneur. The founding members Kaja Leander and Ernst Malmsten were respectively a model and an Arts Impresario. An earlier foray into the retailing of books over the web in Sweden gave them a taste for E-tailing, which they tried to develop on a gigantic scale in Boo. Having ridden the Internet bubble to the point where in late 1999 they were being considered by Goldman Sachs for an IPO at a valuation of \$390m, the company collapsed by April 2000. Strangely, in Ernst Malmsten's (Malmsten *et al.*, 2001) account of Boo's demise there appears little evidence that Boo's basic business model was flawed. Sales and margins continued to rise steadily from the date the site went live on November 3rd 1999. The fatal blow perhaps was the evaporation of investor confidence in Malmsten's ability to implement

the vision of Boo as the premier on-line retailer of sport and fashion wear (Malmsten *et al.*, 2001).

Again and again throughout the Malmsten account of Boo's life one is made aware of the need for Malmsten to conjure up faith in the face of contradictory evidence. For example, Malmsten recounts the bizarre nature of briefing Tony Blair on the economic importance of E-commerce, while unbeknownst to the world he presided over an engulfing crisis at Boo.

Malmsten's background in the Arts had not given him the detailed financial and technical skills that Boo needed. This led him and his co-founder to rely on others, whose own ability they learnt to doubt. Boo also suffered from poor cost control, too high a 'burn rate' of investment and was unable to produce a reliable Internet platform capable of serving a worldwide mass fashion market.

The original founding entrepreneurs, Leander and Malmsten, invited a third equal partner, Patrik Hedelin, to join them because of his background in merchant banking. The problem escalated when they realised they had sought a 'bean counter' but got a 'dealmaker' who was reluctant to accept their constraints. Similarly the initial appointment to the vital role of Chief Technology Officer, Steve Bennett, in Malmsten's view, failed to focus sufficiently swiftly on emerging bugs in the platform. This illustrates one of the central dilemmas of the E-entrepreneurs. To be a success one requires the 'vision' of the generalist, but this very fact can blind the leader to the practical problems of implementing that vision. More 'hands on', less visionary, senior managers, which were needed, were unwilling to take a risk and join an Internet start-up.

A primary role of the E-entrepreneur, as personified by Malmsten, was to maintain the patchwork of expertise required to implement the corporate plan. Would be E-entrepreneurs must be capable of synthesising the contribution of other creative, sometimes unstable, contributors to the enterprise while retaining their own driving vision. So Malmsten tried to referee disputes between Kaja Leander and the

advertising agency, and those between Patrik Hedelin and the merchant bank J.P. Morgan (Malmsten, 2001). Similarly, an entrepreneur needs to deal with shareholders and their sometimes esoteric demands, such as those of Bernard Arnault of LVMH, or Luciano Benetton. But an entrepreneur's role is more than being merely a co-ordinator, as envisaged by economic theory, but also of an inspirational visionary, able to make the whole greater than the sum of the parts. Sadly for Boo.com, Malmsten's vision was not enough to allow the venture to survive, at least under the current management team.

Boo.com was later acquired by a US competitor, Fashionmall.com. Not surprisingly, the new CEO Catherine Buggeln stated:

I was quite proud to tell people I was a 39 year old and had 17 years in the industry, and that we were focused on profitability.
(Corporate Legal Times, March 2001)

Buggeln had recognised the benefits of the \$135m that had been spent building up the public recognition of Boo by the founding entrepreneurs.

Perhaps one problem faced by E-entrepreneurs was the lack of historical role models. E-business equivalents of Wedgewood, Rockefeller, or Richard Branson were thin on the ground in the 1990s as they are today. For example, Malmsten frequently expressed the loneliness at the top of Boo, especially as it spiralled downwards.

Case Study Two - Steve Case of America Online

Steve Case at AOL represents a successful entrepreneur in the sense that he has followed AOL from inception to maturity in the worldwide media conglomerate AOL Time-Warner. Steve Case departed AOL Time-Warner in May 2003, following investor discontent with the

70% decline in the share price in the wake of AOL's merger with Time-Warner.

Strangely, Case embarked on the path of entrepreneurship on the suggestion of his brother Dan, who was advising a somewhat flamboyant serial entrepreneur/inventor called Bill Von Meister who operated an online games operation entitled Control Video Systems (Swisher, 1998). He did not immediately impress everyone, as one journalist (quoted by Klein, 2003) observed:

If you told me Steve Case was Chairman of AOL/Time-Warner you would have to hospitalise me for internal haemorrhaging.

Case's background in marketing at Proctor and Gamble was ideal to help him bring Von Meister's strange creations to market as attractive products. While Case played a central role from day one, he largely supported Jim Kinsey, a lead investor, who acted as CEO. But as an early colleague Randy Dean saw it: 'At the end of the day, Steve was the company, and Jim knew that' (Klein, 2003). This tendency to take a back seat role remained after Case had both founded America Online and acted as Chief Executive of the newly formed enterprise. Jim Kerr, his then Chairman claimed Case was in 'need of adult supervision' (Swisher, 1998) a role initially provided by William Razzbouk and later Bob Pittman of MTV. While Case was a visionary business-builder he lacked the requisite attention to detail necessary to run a large, rapidly growing corporation.

Case's vision was essentially the 'get big fast' brand-building strategy, as incorporated in his motto 'Communications, Community, Clarity' (Swisher, 1998). Building community was important, particularly because of the need for user-supplied content in AOL's business model. But to Case, the importance of community, both within and outwith AOL, was always more than that, as evidenced by AOL's ongoing battles with Microsoft, when Bill Gates threatened 'Either I can buy 20% of

you, or I can buy all of you. Or I can go into this business myself and bury you' (Swisher, 1998). Ted Leonsis, AOL's Chief Technology Officer, depicted MSN as a 'rampaging dinosaur doomed for extinction'. Case portrayed AOL as the 'little guy' serving a market of other little guys, which made up its customer base.

Perhaps the demise of Case's control of AOL, and ultimately of AOL itself as a separate firm, lay in the shift in the business model from an hourly connection fee to a flat \$19.95 in October 1996 (Swisher, 1998). This change was undertaken despite the current unprofitability of the business and connection problems which culminated in a 19 hour 'outrage' (interruption of service) in the preceding August (Swisher, 1998). Following the adoption of the flat-fee, Case split AOL into three operating firms: ANS Communications, to handle the infrastructure, headed by Bruce Bond; AOL studios, under Ted Lionsis; and AOL Networks, headed by Bob Pittman. The introduction of a flat fee changed the focus of AOL from maximising total revenue, or members, to maximising marginal revenue via accessories, with basic membership charged at a premium rate.

It was Pittman's role as media impresario which rapidly shifted the balance of AOL's profit-seeking toward pay-for-view cable television collaborations, where Pittman completed the evolution of AOL into the media/entertainment group of AOL Time-Warner (now Time-Warner). In creating a 'content' provider for web-portals Case was navigating uncharted waters. In this particular battle between the old and new economies, the old became the ultimate victor. While Case continued to promulgate the big picture of a new-economy media empire, his new found colleagues conspired in his demise by reference to very old economy benchmarks. Klein's history of the construction of the AOL Time-Warner empire begins with Home Box Office Chairman and Chief Executive Jeff Bewkes declaring at the AOL Time-Warner Board that:

I'm tired of this bullshit. The only division that's not performing is yours. Every one of us is growing, making numbers. The only problem in this construct is AOL. (Klein, 2003)

The final indignity occurred when AOL Time-Warner reverted to Time-Warner, signalling the extent of the reversal of fortunes.

Case study three - Pierre Omidyar of eBay

Pierre Omidyar gave birth to perhaps the holy grail of the new economy, an Internet start-up that consistently made profits from the first day of operation. In June of 1995, revenues hit \$10,000 a month (Cohen, 2003). As Omidyar saw it:

I had a hobby that was making more money than my day job. So I decided it was time to quit my day job.

Omidyar is unusual amongst E-entrepreneurs in having a largely computing and technical background. After graduating in Computing from Tufts, outside Boston, he worked at a series of software houses such as Claris, Ink Development, Pen Computing and finally, E-shop, developing on-line commercial applications. Two of the start-ups he joined prior to starting eBay had goals of producing commercially viable pen/stylus based computers, eliminating the need for a bulky keyboard. This technology held out the prospect of liberating the computer from the office environment, taking the benefits of computer access literally 'to the streets'. This same democratising vision underpinned the driving vision for eBay.

His on-line auction site Auction.web, later renamed eBay, simply facilitated trade between buyers and sellers, without taking possession of the goods. Omidyar's simple vision was of an online village fair at

which individuals could trade. eBay had no inventory, few employees and high profit margins.

Omidyar's basic vision was producing an enabling technology to empower the small trader relative to multinational corporations. Omidyar reflected upon this later as follows:

If you come from a democratic, libertarian point of view, having a corporation just cram more and more products down your throat doesn't seem like a lot of fun. I wanted to do something different, to give the individual the power to be a producer as well as a consumer. (Cohen, 2003)

Maintaining this vision under the pressures of the market characterised the evolution of eBay as a corporation.

Despite his later multi-billionaire status, Omidyar makes an unlikely E-entrepreneur. In many ways Omidyar was a computing obsessive, with a strong interest in UFOs and extra-terrestrial life (Cohen, 2003). An ex-colleague of Omidyar at E-shop, a prior Internet start up at which Omidyar gained experience, claimed in retrospect:

Pierre was always very serious, very deliberate and very good at finding the cutting-edge. But of all the people at E-shop, I never would of said he was the one who would make the most money. (Cohen, 2003)

Furthermore, Omidyar was a venture capitalist's dream fantasy as an entrepreneur who actually wanted to bale out once the business was financially stable. He enjoyed life outside work, went home at five o'clock and took regular vacations. He neither had obsessive drive, nor tried to feign it. From the start Omidyar augmented his limited business acumen with a succession of trusted lieutenants with greater appetite for profits. Jeff Skoll, a Stanford MBA who had worked on

Knight-Rider's attempt to move classified advertisements to the Web, was such an early appointment that he became regarded as a co-founder of eBay with Omidyar (Cohen, 2003). Skoll focused upon writing the business plan that would form the basis of the planned IPO. Later, Meg Whitman would be brought in from Playskool, a subdivision of Hambro Toys, as CEO for her expertise in brand building and building a management team.

Throughout the transition of eBay from back-bedroom hobby to multi-billion pound corporation, a distinct change in the prevailing E-culture took place. The old community-based, technologically driven, culture was championed by Omidyar and Mike Wilson, the Chief Technology Officer initially appointed to stabilise a fileservers creaking under the growing load. The newly ascendant, profit driven, instrumental, culture was championed by Steve Wesley, Vice-President of Marketing and Business Development (especially business alliances) and Meg Whitman herself. In recalling Wesley's arrival, an insider said:

They wanted to know why this whole community thing was important. They just did not buy into it at all. (Cohen, 2003)

The transformation of culture took place against the background of an IPO process that made millionaires of the majority of eBay's employees and a 22-hour 'outrage' in May 1999 that gave a convenient excuse to remove Mike Wilson and replace him with a more commercially driven alternative. By early 2000 Omidyar was largely disengaged from day-to-day management, preferring to absent himself in order to work with European versions of the eBay site. Unlike Jim Clark, Omidyar was a willing semi-retiree, carrying away a few billion dollars, and recognising his own limitations:

We were entrepreneurs and that was good up to a certain stage. But we didn't have the experience to take it to the next level.
(Cohen, 2003)

The optimal point at which to oust the founding entrepreneur will be the focus of chapter five of this report. The conclusions of that study will in many ways underpin the wisdom of Omidyar's insight.

eBay's new future seems secured, as the Economist notes about its business model with the heading: 'Meg and the power of many' (Economist, 2005). With 150 million registered users, of which 60 million bought or sold something in the last year, the eBay community is the size of a major European country. While eBay has seen some notable failures, like its failure to successfully launch its site in Japan, it is now approaching a position of market dominance likely to attract regulatory interest. One key element to this success has been the attention paid to the problem of building and maintaining 'trust' in the community. One central element of this is the prevention of credit card fraud as a result of eBay transactions. This was enhanced by the \$1.5 billion acquisition of Paypal, an online payments company, in 2002. The Paypal technology negates the need for parties to an eBay transaction to exchange credit card details. Paypal also checks the credit history of traders before they are allowed to register for trade. Beyond these basic checks to prevent outright fraud, the commitment to a laissez-faire approach remains strong within eBay. As Meg Whitman notes:

We make a small number of rules and get the heck out of the way, because the entrepreneurial talents of our users will solve a lot of the problems. (Economist, 2005)

The community vision of eBay, the remnant of Omidyar's presence, remains strong and is a large element of its competitive advantage in a hotly contested Internet space.

Case study four - Jeff Bezos of Amazon.com

The current chapter would not be complete without mention of the father of the 'Get Big Fast' doctrine, Jeffrey Bezos of Amazon.Com. Robert Spector (2000) provides an account of the growth of Amazon.com which is drawn upon here. Originally employed by an early Wall Street hedge-fund, D.E. Shaw, Bezos was a young over-achiever. Bezos was asked by his employer in 1994 to investigate business opportunities on the web. He found web usage was growing at a rate of 2300% per annum. Bezos pointed out 'something growing at that rate is invisible today and ubiquitous tomorrow' (Spector, 2000). Bezos' timing seemed perfect, with 1995 proving to be the year Internet usage started to spread significantly outside its original academic/scientific user base. This dissemination proceeded from the genesis of the Internet in the US Defense Advanced Research Projects Agency, from the 1950s, following the launch of Sputnik I by Russia.

Bezos soon embraced the 'Get Big Fast' mantra for Amazon.com. Crucially, Bezos perceived himself and his creation as the 'poster child for the Internet' (Spector, 2000) and there could be only one child on the poster. The most marked characteristic of Bezos's style was to make losing investors' money almost a virtuous thing, if done in the service of building brand and acquiring market share. During the IPO process of 1997, the first quarter losses of \$2.97m were presented as strategic investments. The prospectus document included the statement:

The company believes that it will incur substantial operating losses for the foreseeable future and the rate at which such losses will be occurred will increase significantly from current levels. (Spector, 2000)

Despite a temporary respite in the well established Internet IPO boom, Bezos and his CFO Joy Covey undertook road show presentations

for the IPO with few quantitative measures of Amazon's past and current performance, although they regarded such figures as 'important underpinnings of our business model' (Spector, 2000). While some eyebrows were raised, such as Slate, Microsoft's online magazine, this did not prevent the stock price rising in the first week of trading from \$18 to \$30, soaring up to \$235 by the following August. Spector's book opens with Bezos being questioned at an annual shareholder meeting about the high and increasing losses of Amazon.com. He argued in reply:

...there's so much Internet opportunity that now is the time to invest. We're trying to make all of our decisions in a long-term context. (Spector, 2000)

This almost imperial vision drove Amazon's diversification into a number of other areas of retailing besides books, with the acquisition in 1999 of Drugstore.com and Homegrocer.com. Even in 1997 Amazon had traffic-attracting deals with the Yahoo!, Excite and Altavista search engines (Kanter, 2001). Such diversification was attractive in the late 1990s. However, Amazon's stock price seemed clearly overvalued at around \$300 or more.

Mark Britto was then appointed vice-president of strategic alliances within Amazon in June 1999, following Amazon's acquisition of Accept.com which he had co-founded. Britto undertook due diligence upon potential partners and monitored a strict regime of controls upon customer quality and effectiveness. In return Amazon offered support in the case of 'outrages' disabling a partner's site, as well as reciprocal representation at a board level.

More recently Amazon sought expansion by means of these partnerships, particularly to allow the in-store collection of goods ordered online. In the US, Amazon made a deal with Circuit City in 2002 for the collection of electrical goods, and is currently seeking partners in the UK in order to offer similar services. Thus, Bezos has followed his

long-term strategy with Amazon.com's stock price doubling in 2002, and profitability finally being attained in the final quarter of that year. Nevertheless, other concerns such as Pets.com, have strewn the path of Amazon's glorious partnerships successes.

Tenacity as a requirement for entrepreneurial success

E-entrepreneurs, like their peers in other sectors, require tenacity. They see themselves as:

...one of those cartoon characters, who occasionally gets blown up by dynamite, or flattened by ten-ton anvils, but always miraculously manages to pull themselves together. (Malmsten et al., 2001)

The E-entrepreneur is almost required to engage in reality denial to retain the necessary confidence to make a loss-making venture viable.

Benabou and Tirole (2002, 2003) and Tirole (2002), in a series of papers, have attempted to capture the benefits of tenacity and self-control under pressure within a theoretical framework. They point out that 'positive thinking' and evidence to support it may be particularly useful in undertaking tasks where the probability of failure is high. An optimistic approach maintains morale and so keeps effort levels high. The self-regulation required by successful E-entrepreneurs may explain why they are often reluctant to sell their stock even when the prospects are objectively bleak. To sell-out requires a loss of self-control, or betrayal of their vision, which they find hard to accept.

This cycle of brash, obsessive, entrepreneurs being ousted from the enterprise that they founded, is almost always the norm. The differing needs of the Internet venture as it travels the spectrum, as described by Bhidé (2000), from high irreducible uncertainty/high profit to low irreducible uncertainty/low profit are best served by ousting the founder.

Perhaps the exemplar of this trend is Jim Clark who sequentially founded and left, Stanford Graphics, Netscape and Healtheon/WebMD. As Lewis (2000) points out, commenting on the evolution of Silicon Graphics:

This is how it always went with one of these new Silicon Valley software companies; once it showed promise, it ditched its visionary founder, who everyone deep down thought was a psycho anyway, and become a sane, ordinary place.

The perceived contribution of an E-entrepreneur varies over the life cycle of the Internet start up. This cycle takes the company through the following stages (Damodaran, 2001):

1. start-up;
2. expansion;
3. high growth;
4. mature growth; then
5. decline.

At some point between stages two and three, the founding entrepreneur often starts to look like a liability to external investors. This point of inflexion might be captured by a study of the stock price response to retaining the founding entrepreneur after the IPO process has been completed. It is this investigation that forms the final substantive chapter of this report.

Summary

This chapter has discussed the rise of the Internet entrepreneur and portrays some individuals that have been central to the intangible value of new-economy ventures. E-entrepreneurs have most of the usual characteristics of entrepreneurs elsewhere: an ability or desire to

take risk, and to seek profit and exercise control. But the demands of the new economy make particularly brutal requirements of individuals to face and manage profound uncertainty. In the early 1990s each dot-com venture explicitly marketed itself as the ‘new-new thing’ (Lewis, 2000). But great ambition comes with great cost and this new industrial landscape contained few icons and fewer mentors. Opportunistic adaptation and an ability to overcome failure earned a premium in such markets. Ironically it seems the very characteristics that allow an entrepreneur to steer the formative business through the start-up phase makes them unlikely candidates to lead more mature corporations that emerge from their initial burst of creative energies. Internet start-ups, like other businesses, pass along an uncertainty/profit trajectory. As profits decline and uncertainty falls they shed the founding entrepreneur and their visionary, but often unstable, leadership.

ENDNOTES

1. From a documentary narrated by Lewis on Discovery Channel in August 2003.
2. As part of my research I decided to get the insights of a practitioner/participant in the events surrounding the bubble in order to balance my own deskbound research based on secondary sources. Mr Richard Turner of Catalyst Venture Capital in Bath was kind enough to speak to me about these issues.

4 THE VALUE RELEVANCE OF UK INTERNET TRAFFIC: POPULARITY, PERSISTENCE & PROFITS

The Internet stock market bubble is perhaps the classic stock market mania of our age, convincing us that little has changed since the South-Sea bubble or Tulipmania (MacKay, 1841; Galbraith, 1993; Shiller, 2000). Since the vast majority of Internet stocks had both negative earnings and negative net asset worth, the huge market values attained in the latter part of 1999 made traditional valuation techniques seem at best irrelevant and at worst perverse. Not surprisingly, when traditional valuation metrics failed, both academics and practitioners began to seek more reliable non-financial indicators of future value.

One such commonly used metric was the amount of 'traffic' channelled to a website. More visits, or longer and repeated visits implied greater customer interest, loyalty and willingness to spend on the company's product or services. An alternative interpretation advanced by Shiller (2000) is that the sheer accessibility of the Internet, at home and work made investors more likely to buy a stock. In the words of one recent paper 'familiarity breeds investment' (Huberman, 2001). Greater public exposure, via the web, increased the salience of a stock, regardless of its economic fundamentals. Huberman (2001) presents survey evidence confirming the importance of familiarity with, and trust in, E-commerce vendors in aiding the proliferation of E-commerce.

The chapter seeks to advance earlier research on the value relevance of web-traffic data by examining the importance of the persistence and predictability of web-traffic data. Sites with more persistent/durable traffic are hypothesised to be more profitable than less persistent and durable ones. Persistently popular sites are expected to be particularly attractive for investors in the new economy. Indeed, Demers and Lev (2001) explicitly raised this possibility at the end of their discussion

of the ‘rude awakening’ of the Internet sector in the year 2000. This investigation extends earlier research that simply relied on the level of web-traffic data to help aide Internet stock valuation. For the purposes of this chapter, high-value companies hosting websites are those with consistently popular websites. Transient popularity may not be perceived by the market as sufficient to attract funds, when company turnover is high and success notoriously fleeting.

Unlike previous researchers who have sought to provide rational explanations of these bizarre valuations, this chapter offers no such comforts. Rather this chapter seeks to explain the observed failure to find the drivers of Internet stock value by reference to emerging behavioural theories of asset pricing (see Hirshleifer, 2001). Specifically, both prior UK and US evidence shows the stock market reacts to non-information (e.g. Shleifer, 1986; Cutler *et al.*, 1989).

The claims made for the value-relevance of web-traffic data

A stream of papers have emerged relating US Internet stock prices to traditional measures of value, such as earnings and book value and/or web-traffic data. This literature might be seen as part of a larger literature seeking to capture a company’s ‘intangible’ sources of value using non-financial measures (Amir and Lev, 1996; Ittner and Larcker, 1998).

Early papers by Trueman *et al.* (2000) concentrated on the incremental power of web-traffic data to explain stock price movements, which often seemed perversely related to traditional valuation metrics such as earnings and book value. Trueman *et al.* (2000) focus particularly on differing constituencies in the Internet market, such as E-tailers (such as Amazon and E-bookers); portals (such as AOL or Yahoo!), and content providers (such as salon.com, Reuters or Lexis). For each sector they relate the stock price to net income, book value and some measures of web-traffic data.

Trueman *et al.* (2000) found that Internet traffic measures are important in valuing Internet stocks. However, this finding comes with the caveat that the importance of web-traffic is greatly compromised once income is decomposed into line item measures, such as gross profit and marketing, research and development expense. It seems web-traffic data may partly capture differences within samples of Internet firms in the way the market views the economic fundamentals of sample firms. For example, for Portals getting the service as widely used as possible may be seen as central to longevity, almost regardless of profit. But for E-tailers in specialist niche markets, large margins on sales might be seen as a more credible business model.

In later work, Trueman *et al.* (2001) investigated the ability of web-traffic data to predict analysts' forecast errors in predicting future revenues of Internet stocks. They reported that web-traffic data did not seem to be fully incorporated into analysts' forecasts of future revenues, despite strong evidence that analysts had access to it. Curiously, Trueman *et al.* (2000) reported that while forecasts for E-tailers revenues could be improved using publicly available web-traffic data, this was not true of forecasts for content provider and portal Internet stocks. Is it possible that these two types of Internet sites differed in their persistence and the predictability of web-traffic?

Why is web-traffic value relevant?

More recent research has focused upon the rationale for the value-relevance of web-traffic data for Internet stock values. Presumably managers in Internet firms share the same wealth-maximisation objectives as managers elsewhere, either for their own, or shareholder's, wealth. Rajgopal *et al.* (2003) regards web-traffic as a managerial choice for managers of Internet firms, where greater web-traffic raises a firm's stock market value. Managers of companies that host Internet sites could offer a small payment to visitors for visiting their site until the

equity market value-added of the last visitor equalled the marginal cost of attracting him/her. Paying for web-traffic underpins many Internet alliances, such as that between AOL and eBay, under which eBay paid \$75m to AOL for directing traffic to it over four years. Bowen *et al.* (2001) characterise web-traffic metrics as capturing deeper structural forces driving firm value which include various network alliances in their customer base. So variations in web-traffic are just a proxy for the ability of Internet firms to form alliances underpinning the number of 'eyeballs' their site attracts. Therefore, using web-traffic to predict the stock price does not imply it is central to value in itself. The value of a website to a customer may largely derive from the shared experience and knowledge attained with other visitors to that site. For example, Rajgopal *et al.* (2003) report that web-traffic has no incremental power to explain Internet stock prices. So, after controlling for corporate alliances, it is not clear that web-traffic has any remaining value in predicting Internet stock share prices.

Internet ventures value and stock market 'sentiment'

A wide range of studies attest to the importance of group mentality, or herd behaviour, in determining stock market investments (Shiller, 1984; Huberman, 2001; Huberman and Regev, 2001). It may be that more persistently viewed websites are regarded as more salient focal points for investor discussion and purchase.

The possibility that Internet stocks are subject to swings in market 'sentiment' is addressed by Hand (2001). In a cross-sectional study of 271 Internet stocks at the beginning of the year 2000, he considers the price-relevance of three proxies for supply and demand conditions in the market for Internet stocks. These are: the size of the flotation of stock; the number of shares sold short in the stock; and the proportion of the stock held by institutional owners. In efficient markets, prices

move to eradicate any net demand. Hence, in an efficient market these factors should have no role in explaining price. Hand (2001) reports that economic fundamentals dominate the pricing of Internet stocks and only a small role remains for demand and supply conditions.

Practitioner interest in the possible value relevance of web-traffic data was aroused by US evidence from Lazer *et al.* (2001). Lazer *et al.* show that web-traffic data can form the basis of a profitable trading strategy. The ability of web-traffic data to predict share price returns survived the bubble's collapse and remained an attractive trading strategy for active investors. The authors advance a strategy of selling stocks which report below-median web-traffic measures in the previous month and use the proceeds to purchase stocks which report above median web-traffic measures. They do so on the basis that web-traffic is an indicator of the future prospects of Internet-based stocks 'albeit an imperfect one'. One reason for the imprecision of the measure is the fact that sites which have been popular in the past may not be so in the future. This renders clear the distinction investigated here: the difference between popularity and the persistence, or durability, of a web-site and the revenues to the host company associated with it.

Is web-traffic data a signal of value or just 'noise' distorting 'true' valuations?

The distinction between popularity and predictability/durability of web-traffic measures is used to cast light on a central distinction in contemporary accounting research. This is a debate between those who see financial markets actively impounding financial and/or non-financial information into prices and those who see the price discovery process as more fraught and unstable. Lee (2001) advances a role for 'noise traders' (in the spirit of Black, 1986; and De Long, 1990) in understanding how financial markets respond to accounting information. Noise traders 'trade because they wish to trade', without regard to fundamentals.

Smarter traders attempt to learn each asset's true worth. These informed traders, who take heed of fundamental value, realise the asset is mis-valued by the noise traders' trades. Yet the informed do not act in case the noise traders influence is even greater in the future. So noise traders 'create their own space', making them impervious to elimination by the more prudent traders. Web-traffic data may be just such a focal point for noise traders, who trade on the information regardless of its ability to signal fundamental value in terms of discounted future cash-flows.

The Jupiter MMXI web-traffic database

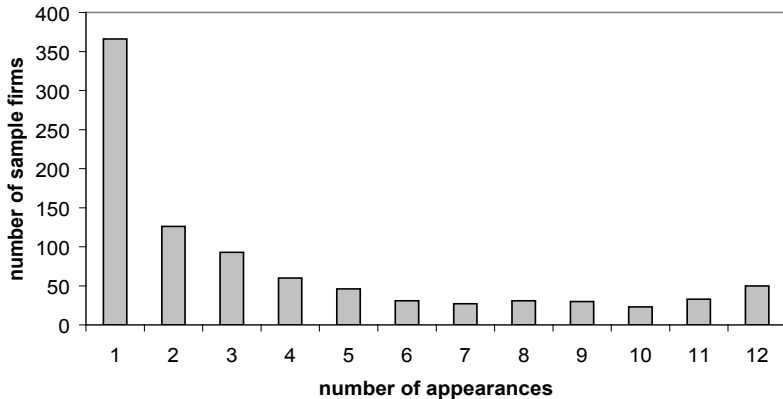
The data on web-traffic is taken from a CD containing monthly reports on European web-traffic produced by Jupiter MMXI, for each month in the year 2000. This is the European equivalent of the data source used by Lazer *et al.* (2001) and Trueman *et al.* (2000, 2001) under its prior name Media Metrix. Jupiter MMXI has attained market leadership of such data and it is widely disseminated amongst market-professionals, journalists and other commentators including academics. The particular time-period covered is of great interest because it surrounds the 'rude awakening' (Demers, 2001) of the early part of 2000.

Each of the 12 monthly reports on data was gathered from a panel of users who agreed to have their web-access metered both at home and at work. Both the sites visited, the household member making the visit and the duration of that visit were logged. The data was only put into the database if it satisfied certain criteria designed to ensure its veracity. At the start of January 2000 the database recorded the usage of about 1,100 individual users in France and the UK and 1,500 users in Germany. The present research analyses the UK portion of this dataset. This data has not been used in previous published research.

Once the panel of random users had been constructed and web-usage recorded, this data was used to make estimates/projections of the amount of traffic at each of the sample websites. Data included in each

monthly report related only to sites which attracted more than 1% of the total estimated web-traffic for that month (had a 'reach' above 1% in the jargon of the trade). Hence, variations in the number of sites included in the reports reflects variations in estimated concentration of web-usage.

The particular web-traffic measure used in this study is the average number (in thousands) of unique visitors per month. Other studies have also used 'reach' as a non-financial valuation metric. But since 'reach' and unique visitors per month had a 98-99% correlation, across firms in each month of the year 2000, for this dataset, it seems safe to focus on unique visitors alone.



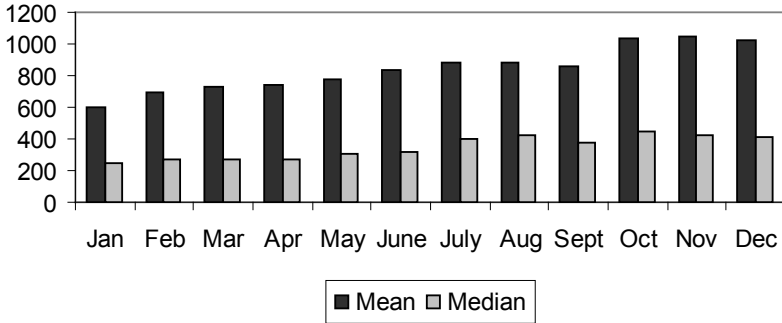


Table 4.1 Descriptive statistics for Jupiter MMXI web-traffic data for year 2000

Month	N	Mean	Median	SD	Skewness
Jan	50	595.04	248.00	878.50	17.57
Feb	50	693.00	272.00	1004.57	20.09
March	50	731.86	274.00	1058.12	21.16
April	50	737.18	275.50	1109.59	22.19
May	50	781.24	304.50	1141.42	22.83
June	50	830.08	316.00	1229.86	24.60
July	50	884.32	404.00	1245.17	24.90
August	50	887.84	422.00	1254.75	25.10
September	50	860.02	373.00	1246.54	24.93
October	50	1040.64	452.50	1482.95	29.66
November	50	1048.62	424.00	1493.50	29.87
December	50	1028.01	415.22	1511.69	30.23

Note: N denotes the number of observations; SD denotes the standard deviation of unique visits.

The description of the web-traffic to the most popular 50 sites in the year 2000 Jupiter MMXI database is given in Table 4.1 above. The right-hand skew of the distribution of web-traffic is clear. The median number of visits is less than a half of the average, suggesting a minority of sites amongst the 50 studied attract a high proportion of the traffic. So, even at its highest reaches, web-traffic is highly concentrated in its distribution

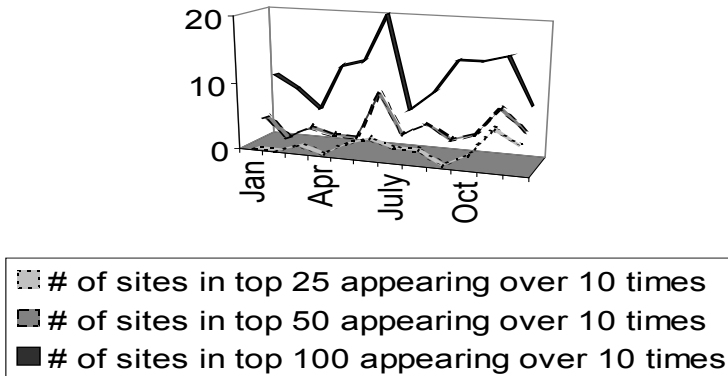
Popularity and persistence - some descriptive statistics

Lazer *et al.* (2001) make much of the unbalanced nature of the data included in tests of the value relevance of web-traffic. The fast-flowing nature of the Internet, with many new entrants and hasty demises each month, resulted in a rapid turnover of sites during the year. The distribution of firms within the panel, in terms of stability of representation, is shown in Figure 4.1. The Jupiter MMXI-database for the UK has 366 websites that appear only once in a monthly report, before sinking below the 1% reach threshold never to be seen again. Only 50 websites manage to appear in each monthly report, 33 appear eleven times and another 23 appear ten times. Because of the focus upon the persistence of web-traffic, only those sites that appear in every month of the Jupiter MMXI database are discussed further. The focus on survivors with web-traffic metrics for the whole 12 months of the year 2000, suffers from some well-known biases (Brown *et al.*, 1992; 1995). The analysis of this chapter relates to the consistently successful, at least insofar as success requires attracting 1% of the audience or more each month. Of course, for many sites based on short-lived events, like the Olympics or a specific product promotion, redundancy is built into its initial rationale.

But this aspect of the research method does not obscure the fact that 780 sites (the total number of sites in the Jupiter MMXI database) do not consistently attain the 1% 'reach' level required to merit inclusion in the sample. The transient nature of most websites' popularity should not lead to the conclusion that Internet visits are to a myriad of rapidly changing

sites. Sites which appeared in all monthly reports for 2000 consistently accounted for 40% or more of all estimated web-traffic in the UK. As Rajgopal *et al.* (2003) note the whole rationale for Internet usage is often social in nature, with web-users using chat-rooms/bulletin boards/ and buddy lists to maintain contact. So well-established, persistently followed, sites are popular. But note also that a site can be very popular for a brief period. So Figure 4.3 reveals of the top 25 sites in any one month, only three at most (in October) manage to appear in the MMXI data base for ten months or more. This implies that amongst the top 10 sites few can consistently attract even 1% of Internet traffic. The position changes very little when we examine the fortunes of sites attracting enough traffic to put them in the top fifty in the database. Even when we examine the hundred most popular sites, as measured by total web-traffic, only 20 appear for ten months or more in the MMXI database.

e than 10 times in top 25/50/100 each



Notes: The above Figure shows how many of the top twenty five (fifty or hundred) sites, as measured by total web traffic manage to appear in 10 consecutive months.

= number

Popularity and persistence

This section explores the list of the top 25 sites to see whether they are joint-products or substitutes for each other. Each month the top 25 sites are matched against those sites in the balanced panel. If popular sites persist it is expected that few popular sites will come from outside the group that appears every month. Figure 4.3 shows that the few popular sites in any one month's Jupiter MMXI report come from those regularly reported upon by Jupiter MMXI. Even when the top 100 sites are considered the number of sites that appear 10 times or more are only 20. The most popular sites are seemingly of largely transient interest to web-users.

The Jupiter MMXI data suggests that sites that persistently attract more than 1% of the audience on the web are certainly popular. Some 106 sites, which exceed the 1% reach threshold, regularly attract between 40 and 50% of all web-traffic. But the Internet audience these persistently popular sites seek to attract is dominated at its highest reaches by sites of sporadic popularity (often associated with sporting events, or television series).

This suggests that persistence and popularity might be valued differently by investors in host companies. This possibility is discussed in the more formal empirical section of the chapter.

The other data used in this chapter includes stock prices for companies hosting the Internet sites, which are taken from Datastream. Very often the use of Datastream data on share prices meets with the objection that it ignores the payment of dividends. This is unlikely to be a problem, because almost none of the firms included made a profit from which to pay a dividend.

Test method and results

Having given some evidence that popularity and persistence are not the same characteristic for a website this section proceeds to investigate

their relative valuation by the stock market. The reason for doing so is that much prior literature assumes a popular-revenue generating site this month is likely to be a similar site next month. Rather than investigating whether web-traffic forecasts revenues and, therefore, earnings or price, this section simply asks whether web-traffic can, in itself, be predicted.

Persistence is judged by the degree to which subsequent months' unique visits are explained by last month's visits. If more than 50% (25%) of the variance of this month's number of unique visits is explained by last month's number of unique visits then a site's web-traffic is deemed to be persistent at the upper (lower) limit, and is judged by using the correlation coefficient of a regression of that month's web-traffic on last month's traffic.

Two alternative cut-off points are used for the purpose of investment portfolio formation. These are that the correlation between this month's and last month's number of unique visits is: i) above 0.5; and ii) above 0.25. If the correlation between successive months' number of unique visits exceeds 0.5, then web-traffic for that site is seen as being highly persistent. At the lower correlation of 0.25, weak persistence is regarded as being present.

Stocks are classified into: (a) popular; and (b) persistent sites, using the web-traffic data provided by Jupiter MMXI. The value-relevance of that information is estimated by using the share price that is available on Datastream. However, the majority of websites were financed by private venture capital and, even where data on financial performance is available, it is only provided on an annual or quarterly basis. Thus, this chapter focuses on 28 companies that operated websites where financial data was available.

The profitability of trading strategies based on both the popularity and persistence of web-traffic to a host's site, as well as the combination of both characteristics, is examined. Trading profits are based on the returns of holding a portfolio of stocks with host sites which are both popular and persistent, compared to the return on a portfolio of stocks not boasting those characteristics.

In order to control for the dilution of reported results by the inclusion of sites relating to traditional businesses, such as Prudential and WH Smith, results for the returns to trading strategies are replicated for a sample of 'pure-play' Internet stocks. This depletes the original 28 firms to 15 firms. Such 'pure-play' Internet stocks derived their very *raison d'être* from the Internet. Despite undertaking this additional check, the importance of web-traffic for traditional businesses in terms of investor relations and customer contact should not be forgotten. The Web is a simple way to make traditional businesses more accessible and, hence, more attractive to both customers and investors. As such it might be expected that the successful management of a company's Web presence will be valued by the market.

The value relevance of the popularity and persistence of a website to its host company's stock price is judged by examining the performance of a portfolio of stocks hosting popular and persistent sites with those which do not have those characteristics. For this purpose raw stock price returns are used.

Results

Persistence and popularity

This section begins with some basic data description of web-traffic for sites appearing ten times or more in the Jupiter MMXI report for 2000. First, the number of visits rises steadily over the year 2000 (see Figure 4.2), making the stock market decline of the early part of the year seem puzzling (Demers and Lev, 2001). Perhaps part of the reason for the decline in stock prices is the increasing instability of web-traffic. This instability seems particularly pronounced for sites with less than a full set of appearances in the Jupiter MMXI database. The ratio of the standard deviation of unique visits to its mean value each month is denoted by V , and this number doubles over the year for the 50 sites.

The question of whether the unstable character of such sites' web traffic is recognized and priced by security markets is investigated below.

Before examining potential trading profits, sites are categorised as being popular and/or persistent. This is done by estimating the correlation between successive months' web-traffic for each of the sample firms.

The persistence of web-traffic declines with less frequently appearing sites. This is to be expected, of course, given that the most obvious reason for a non-appearance is the failure to attract more than 1% of the target audience. But failure to appear may also reflect a site's recent entrance to, or exit from, the market. Nevertheless, the sites which frequently, or always, appear in the Jupiter MMXI report, are more likely to display signs of persistent web-traffic. But this does not disguise the fact that few sites display any sign of persistence, regardless of how frequently they appear. Sites are ranked by total traffic to them in the year 2000, initially focussing on the fifty most popular sites. Nine of the fifty top traffic sites in the MMXI database record negative correlations between the number of unique visits for one month, over successive months' unique visits, implying dramatic falls in unique visits after their initial appearance. Only 17 of the fifty balance panel sites report correlations between subsequent months' traffic above the 0.5 threshold, with this rising to 27 in the case of the 0.25 threshold. This implies that, even amongst sites that consistently draw more than 1% of all their target audience, the attention of that audience is somewhat fragile and fickle. Clearly, persistently winning an audience for a website is difficult, even for those host companies which manage to get their sites' traffic consistently above some minimal threshold.

Having categorised the persistence of unique visits to a site, the outcome of the exercise, in terms of the allocation of firms to portfolios, for a set of host's stock available on Datastream, is summarised in Table 4.2, where the value-relevance of popularity and persistence is examined.

Table 4.2 Persistence and popularity of unique visits

Host company/site	This month's share price return correlation with last month's traffic >0.5	This month's share price return correlation with last month's traffic >0.25	Above median web-traffic				
			Jan	Feb	Mar	Apr	May
			Number of host company sites				
			=248	=272	=274	=275	=304
Amazon.com	Yes	Yes	Yes	Yes	Yes	Yes	Yes
British Telecom	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cable & Wireless							
Comet	Yes	Yes					
Dixons			Yes	Yes	Yes	Yes	Yes
eBay			Yes				
Ebookers							
Emap	Yes	Yes	Yes	Yes			Yes
Fortune City	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Goto.com	Yes	Yes		Yes	Yes	Yes	Yes
Homestead		Yes					Yes
IBM							
Looksmart			Yes	Yes	Yes	Yes	Yes
Microsoft	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MP3.com				Yes			
NTL							
Prudential		Yes	Yes	Yes	Yes	Yes	Yes
QXL			Yes	Yes	Yes	Yes	Yes
Railtrack		Yes	Yes	Yes	Yes	Yes	Yes
Scoot	Yes	Yes					
Sonera							
Tesco		Yes	Yes	Yes	Yes	Yes	Yes
Thus			Yes			Yes	
Virgin	Yes	Yes	Yes	Yes	Yes	Yes	Yes
W H Smith	Yes	Yes					
Worlds							
Yahoo		Yes	Yes	Yes	Yes	Yes	Yes

Notes:

Persistence - The second and third columns report univariate correlations between web-traffic data for the previous month and share price return for the host stock that month. A 'yes' in the second column reports if the correlation between lagged web-traffic and current returns equalled or exceeded 0.5, the third if that correlation equalled or exceeded 0.25. Where there is no entry, the correlation was below the 0.25 threshold.

Popularity - The remaining columns show whether monthly web traffic exceeded the median web-traffic for the sample that month, where there is no entry, this means 'no'.

Table 4.2 summarises the persistence of web-traffic for listed firms using the cut-off criteria outlined above. This study employs the Lazer *et al.* (2001) criteria of whether the web-traffic ascribed is popular, or whether a particular site is above, or below, the median level of web-traffic that month. The latter columns of Table 4.2 report for each host company/site whether web-traffic was above the median level of traffic for that month. Here the median is calculated separately for each month, before the non-listed firms are deleted. The fact that the split of the number of companies above and below the median is roughly equal, may imply that listed firms probably do not enjoy dramatically higher levels of web-traffic than non-listed firms. Most sites in most months are not popular.

The first noticeable trend, with one or two notable exceptions (Dixons and WH Smith), is that popularity and persistence go together, at least when persistence is defined as having an estimated monthly correlation at least equal to 0.25. The other strong feature of the data is the roughly equal division of the sample between sites which consistently lie in the upper, or lower, half of the distribution of unique visits and those that fluctuate around the median. It is from this latter group of firms, which exhibit erratic popularity, that the importance of the theme of the current chapter springs.

The results show that popularity and persistence may be different characteristics and that the latter is harder to achieve than the former. To create a high stable core audience to a website is not easy, but it appears very important that popularity is persistent if web-traffic is to

be a true value driver of an Internet site's host corporation's value. Only in this way can visits in the past be confidently converted into cash-flow and value in the future. While this would appear logical enough, the final part of this chapter examines whether this fact is recognised by the stock market.

The information content of persistence and popularity of websites

Figure 4.4 Average share price for companies appearing each month in

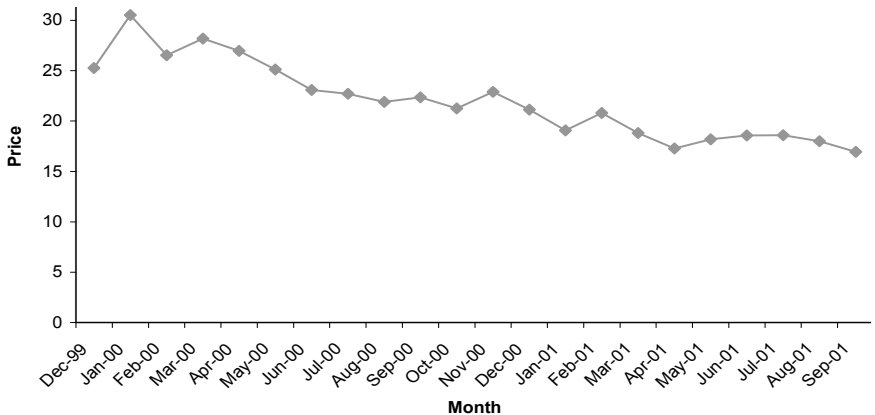


Figure 4.4 begins the analysis of the share price data. It shows the average stock price of Internet firms whose sites are reported upon by the Jupiter MMXI database, regardless of whether they appeared ten times or more, and so were included in the final sample for analysis. The decline in price, beginning in February 2000 but continuing steadily throughout the year, cuts the average price by over 40% by the end of the year. Thus, trading strategies based on web-traffic data would be required to earn profits in a bear market if they are to succeed. In the UK market short-selling is only permissible by Market-Makers in the

stock, and only then only under restrictive conditions, such a task may have been difficult.

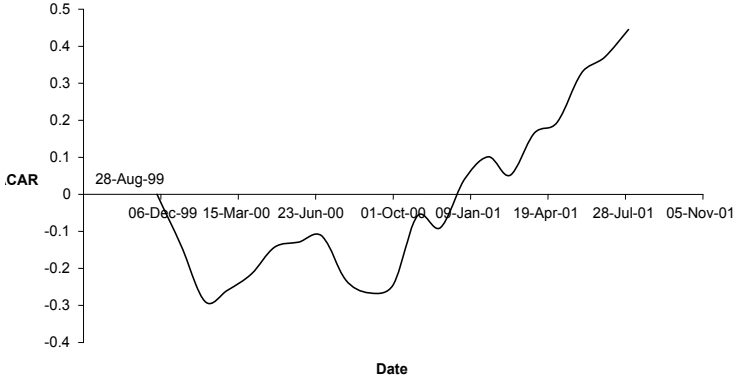
The problem with using a trading strategy based on persistence is that a time-series needs to be built up. For this reason, firms are classified into persistent and transient portfolios at the beginning of 2001, based upon their correlations in consecutive months across successive unique visits numbers. So the performance of persistence-based portfolios from the beginning of 2001 is traced. Further, this delay avoids the profitability of an information-based trading strategy in the middle of a stock market collapse, when almost all Internet stocks fell in value regardless of their worth.

Figure 4.5 shows that the portfolio of stocks as a whole performed reasonably well in 2001, recovering from the year 2000. Figure 4.5 presents evidence concerning the profitability of a trading strategy based on the popularity of a website. Following Lazer *et al.* (2001), a popular site is defined as one which has web-traffic in the prior month lies above the median for that month. Since a number of companies hover around the median during the year this trading requires a dynamic rebalancing of the portfolio at the end of each month, unlike a trading strategy based on persistence (estimated by the correlation between successive months' unique visits) where each stock remains fixed in its designated portfolio.

Figure 4.5 shows that while a trading strategy based on the popularity of a site is, significantly, profitable by the end of the year, it is only sporadically so, with losses in four of the eleven months of its implementation.

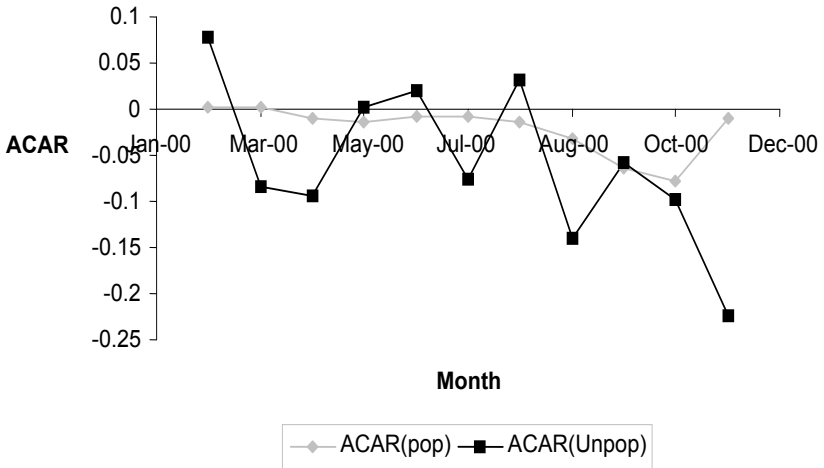
Figures 4.6 and 4.7 provide evidence concerning the value to traders of information about web-traffic persistence. Figures 4.6 and 4.7 make it clear that, regardless of the cut-off point, there appears little systematic profit to be made by selling shares in companies hosting sporadically visited Internet sites and using the proceeds to fund the purchase of equities in companies hosting sites with persistent traffic. This casts doubt on the reliance placed on web-traffic as a source of fundamental or true value for Internet stocks.

Figure 4.5 Average cumulative abnormal returns to holding stocks appearing each month in Jupiter MMXI report



Note: ACAR = Cumulative abnormal returns (% shareholder wealth)

Figure 4.6 Average cumulative abnormal returns to stocks in the balanced panel portfolio

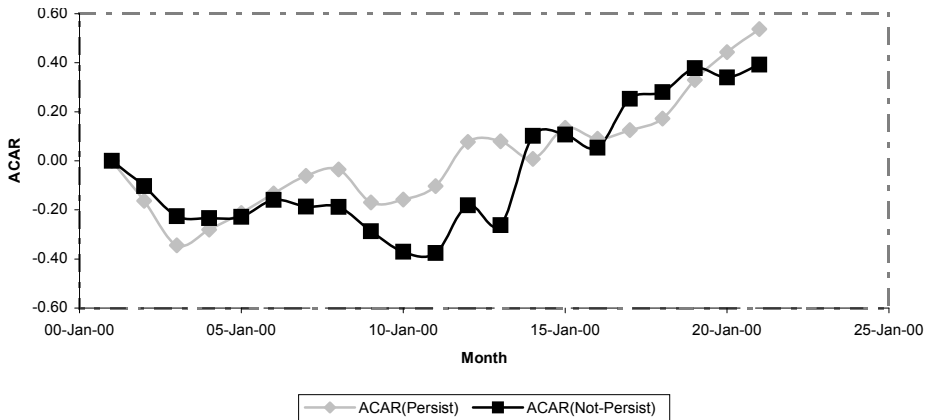


Note: ACAR = Average cumulative abnormal returns (% shareholder wealth)

Figure 4.6 shows that any profit from buying popular stocks (funding the purchase through sales of unpopular stocks) in the later part of 2000 was soon eroded in the early part of 2001. This test uses the correlation of this month with last month's number of unique visits that exceed a 0.5 definition of persistence, and so includes only very persistently popular stocks in the buy portfolio. The difference in returns for persistent, as against transient stocks, could not be exploited by investors in 2000, unless they had information on web-traffic persistence from 1999. Since the Jupiter MMXI database began in the middle of 1999 this seems unlikely. Hence it is unlikely that an investor could have set up the portfolios recorded in this study, much before the beginning of the year 2000.

Cumulative abnormal returns

Figure 4.7 Average Cumulative abnormal returns for persistently viewed (slope >0.25) and transient stocks in Jupiter MMXI balanced panel



Note: ACAR = Cumulative abnormal returns (% shareholder wealth)

This analysis is repeated for a sample of 'pure-play' Internet stocks, deleting traditional businesses such as Prudential, Railtrack and WH Smith. This reduces the number of companies from 28 to 15. Despite the increased importance of news regarding web-traffic for this sub-set of stocks a trading strategy based on its usage shows little sign of sustained profitability. The modest profitability in the first few months, while statistically significant, is likely to reflect a more general recovery of Internet stocks in this period.

The failure of a trading strategy based on the persistence of web-traffic is of course easy to explain. Such a strategy could conflate two types of websites, the persistently popular and the persistently unpopular sites. So in the final test of the chapter, a trading strategy of buying only stocks for hosts of persistently popular sites and selling all others is examined where a site is denoted as popular if it attracted an above the median level of web-traffic in all the monthly reports of the year 2000.

The trading 'pure-play' strategy results in the purchase of Amazon, FortuneCity, Microsoft, Prudential, and Yahoo!, with all other host stocks being sold to fund these purchases. The strongly counterintuitive results indicate that a portfolio of persistently popular sites produces a worse return than those of a portfolio of host firms operating sites without those twin characteristics. This raises doubt about the implicit assumptions underlying much of the literature that interprets web-traffic data as predicting revenues, and so indirectly value, for hosts of Internet websites.

Summary

The perverse pricing of Internet stocks that attributed sky-high values to companies with no profits or assets, produced a need for new, more credible, value metrics than those that were in current financial reports. One prominent measure was 'eyeballs' or Internet traffic, including: the number of visitors to a site; the duration of their visit; or their likelihood of returning and these were advanced as predictors of Internet stock

value. An assumption underlying such claims was that Internet traffic was sufficiently predictable to be of use in judging future visits, sales and hence profits for Internet sites. This chapter critically evaluated this assumption and shows it to be flawed. Internet traffic is dominated at its highest reaches largely by sites of sporadic interest, associated with sport (e.g. the World Cup, or the Olympics) or television (e.g. reality television programs like Big Brother). For this reason, popularity does not directly imply persistent popularity and an ability to generate sustained revenues and, hence, profits.

A small but growing body of research has appeared in the US suggesting that the strange and gyrating valuations of Internet stocks might be better understood by reference to the informational role of web-traffic in signalling both past and future revenues. Other studies examine the incremental content of web-traffic data, over and above data on past revenues to predict the forecast errors made by analysts in estimating Internet firm's earnings. This, chapter, which is the first of its type on a non-US dataset, points to a potential confusion in the literature. Website popularity only predicts a future Internet site host's revenues if that traffic is expected to persist over time. In particular, one might expect persistently popular sites to be those most valued by the market.

This chapter explores a number of these issues. It finds that popularity and persistence are different and, thus, one might expect them to be valued differently by investors. At its highest echelons, web-traffic is largely dominated by a relatively small number of sites. Contrary to expectations, persistently popular sites earn lower returns than those not combining these characteristics. Nevertheless, there remains modest evidence of a strategy based on popularity alone earning significant, but transient, and therefore risky, profits.

Earlier studies have struggled to fit Internet stock valuations into the rational market paradigm. But perhaps the release of web-traffic data simply lacks information about fundamental value for analysts and portfolio managers. Certainly, increased web-traffic to a site will raise its

public profile. Familiarity breeds investment and more visitors to a site increases investors' knowledge of the firm and its activities. This may be particularly true of on-line individual investors. Thus, popularity of a site may predict stock price returns, while saying little about the fundamental value of Internet stocks.

Moreover, the current study only reports evidence based largely on a small number of companies. As Lazer *et al.* (2001) show, once unbalanced portfolios are used the econometric technique for judging information content must be adjusted accordingly. The sample of companies used in this study is almost certainly unrepresentative of the hosts of websites as a whole. Further, alternative measures of website popularity and web-traffic persistence should be explored and their impact on attainable trading profits calculated. So the purpose of the current chapter might be seen as pointing to a problem in the extant literature, rather than advancing a fully worked out solution to that problem.

This study is the first to study the impact of Internet web-traffic on UK host firms' value, although the US literature contains a number of such studies. The results suggest that a strategy of buying popular stocks, funding the purchase by sales of unpopular stocks yields transient statistically insignificant profits. Web traffic alone appears a poor predictor of next month's return to an Internet host. Surprisingly, an inverse relation between persistent profitability and firm value is uncovered. This casts doubt on attempts to generalise US studies. Previous US research by Lazer *et al.* (2001) appeared to confirm the ability of web-traffic to predict Internet stock prices following the stock market downturn of 2000. The present study cannot confirm this finding and presents some weak evidence to refute it.

The instability of Internet web-traffic makes it both a poor predictor of itself, as well as future revenue to the host of a site. One possibility is that 'familiarity breeds investment' and more popular sites are simply more salient in investors' minds when they come to trade. Investment, like the web-based community itself, is an inherently social process. Stocks that are

being talked about today are likely to attract discussion and consequently investment. In doing so investors may pay too little attention to the predictability of Internet web-traffic. Popularity and persistent popularity are not the same thing. Only persistent popularity holds out the prospect of sustained profit for the host of an Internet site.

5 THE BOYS IN THE BUBBLE: INTERNET ENTREPRENEURS AND STOCK MARKET VALUE

Introduction

This chapter expands the set of non-financial indicators of Internet stock value to include those that are attributable to the retention of the founding entrepreneur. The failure of traditional financial value metrics to adequately explain the Internet stock boom has already provoked much research on non-financial indicators of firm value. The current chapter adds to this trend of seeking ‘intangible’ sources of value for Internet stocks value, by focusing on the role of the founding entrepreneur.

A sudden stream of papers have emerged relating US Internet stock prices to traditional measures of value, such as earnings and book value and/or web-traffic data. This literature might be seen as part of a larger literature seeking to capture a company’s ‘intangible’ sources of value using non-financial measures (Amir and Lev, 1996; Ittner and Larcker, 1998; Demers and Lev, 2001; Lev, 2001). One early strand of the literature has focused upon the use of web-traffic data as a predictor of future revenues and this was the theme of chapter four. The current chapter seeks to advance the debate by considering the role of another source of intangible value, the presence of a clear leading, often founding, figure within the firm.

While theories of entrepreneurship abound, reliable evidence is more scant (Bhide, 2000), particularly in the area of E-entrepreneurs. This chapter seeks to improve understanding in this area by examining the effect on firm value of the retention of the founder of the firm by means of an extension of an existing popular model of Internet stock pricing.

Internet stock value and the founding entrepreneur

The whole history of computing is strewn with strong characters, but the entrepreneurial ethic is not restricted to the start-up context, with many old, or simply middle-aged, ventures trying to grow their own new economy champions. Kanter (2001) illustrates this trend by the example of Reuters 'Greenhouse fund' for developing venture capital spin-offs in the new-economy, which Kanter dubs the 'outside in' approach. Conversely, Sun Microsystems seeks to keep its cutting-edge status by giving a large degree of autonomy to managers to innovate by initiating new projects, which might be termed the 'inside-out' approach. Both methods are ways to keep the frontier spirit alive as the corporation moves up the FTSE/S&P 500.

Leadership figures often add value as well as excitement to corporate life for Internet firms. In addition to anecdotal evidence, the role of the individual entrepreneur has been considered pivotal to economic success by leading academic authorities and has given birth to the whole area of academic study entitled entrepreneurship. Even an entirely altruistic leader can serve a function of both ensuring co-operative behaviour and encouraging the belief that others will behave co-operatively (Casson, 1991; 1995).

The intangible nature of an Internet enterprise at the start-up phase can blur the distinction between the founder entrepreneur and the corporate entity itself. Lewis (2000) describes the next foray into the Internet revolution of Jim Clark, founder of Silicon Graphics and Netscape, as follows:

If he was going to create the most valuable company in America it would need a name. He might as well have written 'Jim Clark Enterprises' for that is what it amounted to. Instead he wrote 'Healthscape'.

The entrepreneurial function requires the production of an atmosphere of personal commitment to the success of the enterprise. To retain the necessary moral leadership required to steer a successful venture potential leaders require both consistency and clarity in their direction of the firm (Casson, 1991). Such requirements often conflict with one of the principal characteristics of those willing to found new enterprises, that is an unusually high tolerance for ambiguity in the task. Ambiguity about the meaning and purpose of a task can often be troubling to those expected to undertake it. A feeling of 'what the hell do I do now?' can engulf a person and render their performance ineffective. The effect of task ambiguity upon financial decision-making has already been explored in a wide-variety of financial decisions (Einhorn and Robin, 1982). Both technological and financial pressures require quick wits and an ability to weather set backs as the firm evolves in its initial phase. Hence, the successful entrepreneurs will need to marshal high degrees of commitment by others, including employees, suppliers and customers, to goals which are often only loosely defined. Inevitably, such skills are rare and hence not easily replaced.

Furthermore, the departure of the founding entrepreneur, often in the run up to, or shortly after, the initial public offering (IPO), can be interpreted as sending a negative signal about the true value of the underlying firm (Myers and Majluf, 1984). The very fact that the founder chooses to bail out at the IPO may be interpreted as a signal that the bubble is about to burst. While institutional investors often seek a 'heavyweight' to Chair the post IPO firm, some value of the founder's charisma is likely to remain.

Whatever the role of the entrepreneur is in the average start-up, their presence seems central to the success of Internet firms. This is because of the need to have a physical embodiment of the largely intangible assets that constitute the firms, in the form of brands, organisational and intellectual capital. A strong entrepreneur can help to mitigate some of the costs faced by firms with largely intangible assets (Lev, 2001).

Entrepreneurs' worth

Any study of Internet stocks faces the problem that while many companies have very active websites, only a minority can, in any real sense, be described as 'Internet' firms. Hence, this chapter focuses upon a minority of 'pure-play' Internet firms. In the US, the ISDEX™ index is a listing of 50 stocks that represent the range of publicly-traded Internet companies. It has existed since April 1996, which serves as a good date from which to chronicle the Internet 'bubble'. Internet.com corporation believes the ISDEX™ best represents the Internet investment barometer and it is one of the first pure Internet indexes. ISDEX™ is quoted on a regular basis in leading financial and media including The Wall Street Journal, Reuters, Dow Jones Newswire, CNBC, SmartMoney magazine and others. More importantly for the current purpose, the ISDEX™ index has been widely used in previous academic studies on Internet stock valuation. These studies underpin the empirical methods used in this research.

For the definition of a 'pure-play' Internet stock, Internet.com relies on generally accepted industry definitions of companies identified through their own and third-party news reporting and company reporting, to establish the nature of a company and its classification. This is necessary because a Standard Industrial Classification (SIC) code, or other classification system, has not been created that properly identifies, or is up to date with, the burgeoning Internet industry and its diversity. In addition, the composition and structure of ISDEX™ has met with broad industry acceptance through the licensing of the ISDEX™ on Yahoo Finance, Upside.com and Upside magazine as well as international licensees.

Internet.com allocates firms to the index using a criteria requiring more than 51% of revenues to be generated from web-related activities. This test was established to distinguish companies which only exist because of the Internet. ISDEX™ seeks to provide investors with a representative index of Internet companies that exist because of the Internet. This simple majority test separates 'pure-play' Internet companies from others who may

have Internet products, but which would exist, and do exist, without the Internet generating a majority of revenue. Internet.com relies primarily on the 51% test to determine if a company should be listed on ISDEX™. There are no minimum market capitalisation, trading volume or shares outstanding qualifications.

The second and third criteria used by Internet.com are market-share statistics, measured by revenues, and whether the company represents the Internet industry according to seven subsections of Internet industry enterprises. ISDEX™ is reviewed quarterly to add, or delete, stocks that best represent the Internet industry for investors. If a new category debuts intra-quarterly, that stock may be added to ISDEX™ immediately upon IPO, or soon after.

Internet.com, using its own and third party data, has determined that 89 stocks met the 51% revenue criteria in 1999 to be classified as 'pure-play' Internet stocks. The market capitalisation of those 89 stocks on February 12, 1999 was 400 billion US dollars. The market capitalisation of the 50 stocks in ISDEX™ was 380 billion dollars on February 12, 1999. Therefore, ISDEX™ represents 95% of the capitalisation of the Internet stock universe on that day and well over 90% on an ongoing basis.

Test method

In order to test the hypothesis that the success of a E-business venture hinges on the role of a central entrepreneurial figure an attempt is made to capture their value within a traditional valuation model. To determine their impact on valuation, two existing models are used. The first draws on a recent, but fast-growing, literature seeking to value Internet stocks relative to accounting fundamentals. The second seeks to devise a trading strategy based on selling the shares of Internet stocks when the founder leaves the firm and using the proceeds to purchase Internet stocks when the founder remains in place. While the ISDEX™

index was founded in April 1996, the founding companies are traced back to January 1995 because the initial rankings were based on 1995-96 financial year data.

Entrepreneurship, price and accounting fundamentals

The framework used to relate economic fundamentals to firm value is an amended form of the Ohlson (1995) framework employed in a number of previous papers in the area (for example Trueman *et al.*, 2000 and 2001; and Trueman *et al.*, 2001). In the Ohlson (or Ohlson/Feltham) framework, price (P) is a function of book value and a weighted average of earnings relative to a capital charge, or 'residual income'.

Previous literature has often focused upon the role of web-traffic in affecting the underlying relationship between market value and accounting fundamentals. The same framework is used to examine the impact of the presence and background of the founding entrepreneur on firm value for Internet stocks. In this model the Internet value is a linear function of book value and residual income after control for the retention of the founding entrepreneur.

Under the null hypothesis that the presence of the founder has no effect on firm value, the relation of fundamentals, book value and residual income to price should be the same for firms retaining and shedding their founding entrepreneur at the IPO. If the presence of the founding entrepreneur adds value to the Internet stock, then firms retaining their founding entrepreneur after their IPO should display a premium in their stock price over those with similar fundamental value characteristics.

In a series of papers, Hand (2001, 2003) has tried to address the somewhat tortuous relationship of Internet stocks to traditional sources of accounting fundamentals. In these papers Hand argues that the fact that losses were rewarded by the stock market during the Internet boom

was not unreasonable, given that they resulted from attempts to dominate the Internet space in the early part of a longer market play.

Internet start-ups seemed often to be rewarded for losses incurred as a part of 'winner-takes-all' strategy. For example, two of the illustrative firms from chapter three, AOL and Boo.com, regarded building the brand name of the site as a central plank to their business model. Hence, Hand suggests losses and asset write-downs might be positively priced by the market because they are associated with market-dominance and subsequent sustainable profits.

Entrepreneurship and trading profits

The true test of entrepreneurial value nevertheless remains in creating wealth for shareholders in the post IPO firm. For this reason there is an additional test. This is a portfolio based test which compares the cumulative abnormal returns to purchasing a portfolio of stocks in which the founder(s) remain in place after the IPO with a portfolio, where the founder has already departed the firm.

Obviously, investing in Internet start-ups is a lot more risky than investing in a typical blue chip stock. Hence, some control for risk seems appropriate in calculating returns. Sadly the short trading history of the overwhelming majority of the stocks (only five were quoted at the start of the sample period in January 1995) makes procedures based on prior estimates of beta, etc., infeasible. For this reason a simple market-adjusted return metric using the NASDAQ index is used. The ISDEX™ only began one year after the sample period begins. Investor returns are defined as the difference between the return on a particular stock and the return on the NASDAQ market index, cumulating returns each day to get an overall measure of returns. Trading profits/losses are compared to a strategy of buying stocks of those firms retaining their entrepreneur and selling short those from which the founder departs. A finding of a positive return to this strategy implies retention of the founding entrepreneur adds value to the firm.

Table 5.1 Founding entrepreneurs for firms in ISDEX™ Index

Company	Founder Present	Name	Company type
Broadvision Inc	Yes	Pehong Chen	E-enablers
Checkpoint software Tech	Yes	Shlomo kramer & Gil Swed	Security
Ciena Corporation	No		Performance software
Cisco Systems Inc	No		Speed & Bandwidth
CMGI Inc	Yes	David Weatherhall	Performance software
CNET Networks Inc	No		Content & Communities
Commerce One Inc	No		Financial Services
DoubleClick Inc	No		Advertising
E*Trade Group Inc	No		Financial Services
eBay	Yes	Pierre Omidyar	E-tailer
EMC	No		Software
Exodus Communications	No		Site hosting
Homestore.com Inc	No		E-commerce Enablers
Hotel Reservations Network	Yes	David Litman & Robert Diener	E-commerce
I2 Technologies Inc	Yes	Sanjiv Sidhu & Ken Sharma	Web based supply management
Infospace Inc	Yes	Naveen Jain	Wireless & Broadband
Inktomi Inc	Yes	Eric Brewer & Paul Gauthier	Speed & Bandwidth
Internet Security Systems	Yes	Christopher Klaus	Security
Intuit Inc	Yes	Scott Cook & Tom Ptoulx	Performance software
Jupiter Network	Yes	Pradheep Sindhu	Speed & Bandwidth
Liberate Technologies	No		Performance software
Multex.com Inc	Yes	Isaak Kareav	Content & Community
Netegrity Inc	No		Security
Net2phone Inc	Yes	Howard Jonas	Performance software
Openware Systems Inc	No		Wireless & Broadband
Palm Inc	No		Wireless & Broadband
Portal software Inc	Yes	John Little	Search & Portal
RealNetworks Inc	Yes	Rob Glaser	Performance software

Table 5.1 Founding entrepreneurs for firms in ISDEX™ Index (Continued)

Company	Founder Present	Name	Company type
Red Hat	Yes	Bob Young & Marc Ewing	Performance software
Research in Motion	Yes	Mike Lazaridis	Wireless & Broadband
RSA Security Inc	No		Security
S1 Corporation	Yes	James Mahan	Performance software
Sapient Corporation	Yes	Jerry Greenburg & Stuart Moore	Consultancy & Designer Index
Sun Microsystems Inc	No		Content & Community
Sycamore Networks	Yes	Gujuraj Deshpande, Eric Swanson & Richard Barry	Speed & Bandwidth
Terra Networks SA	No		Search & Portal
Tibcore Software Inc	Yes	Vivek Ranadive	Performance software
Ticketmaster	No		E-commerce
Ultracom Inc	No		Wireless & Broadband
Vignette Corporation	No		Performance software
Wireless Facilities	Yes	Missah & Masood Tayeba	Wireless & Broadband
Yahoo! Inc	Yes	David Filo & Jerry Yang	Search & Portal

Results

Table 5.1 gives some basic information regarding the sample ISDEX™ firms, their founders, if they remained on the company's Board, and the sector to which www.Internet.com allocates the firm. Table 5.2 gives some summary statistics regarding the price and accounting data used in the tests. As can be seen, the sample contained some firms reporting very large losses, as great as \$140 per share in one case. For this reason all data values are restrained to remain within three standard deviations of their mean values in order to mitigate the impact of bias arising from the presence of outliers in the data set.

*Table 5.2 Summary statistics for data used in regression based tests
(% shareholder wealth)*

Variable	Mean	SD	Max	Min	N
Price	18.28	18.81	121.66	0.47	216
Earnings-per-share	-93.98	66.65	75.00	-140.68	317
Book Value	2.02	1.05	4.15	-0.27	371

Table 5.3 Correlation matrix for accounting variables entering regression-based tests (% shareholder wealth)

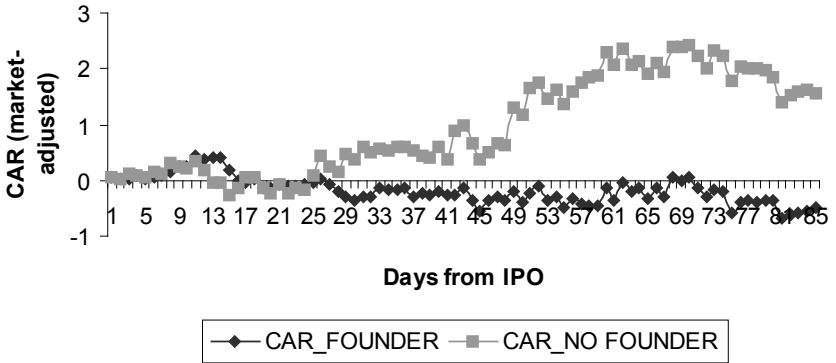
Regression based tests			
Variable	Price	Earning-per-share	Book value per share
Price	1.00	-0.39	0.26
Earnings-per-share	-0.39	1.00	-0.43
Book Value	0.26	-0.43	1.00

Table 5.3 gives some basic Pearson correlations between price, Earnings-per-share (EPS) and book values. Price is negatively correlated with EPS and positively correlated with book value. Curiously the inverse correlation between EPS and book value is somewhat greater than the correlation between either variable and price. This gives some credence to the ‘winner-takes-all’ business model of most Internet start-ups where firms make large up-front investments to ‘Get Big Fast’ in the words of Jeff Bezos of Amazon. Highly valued Internet firms already have significant assets in place and are busily spending cash to consolidate their market position.

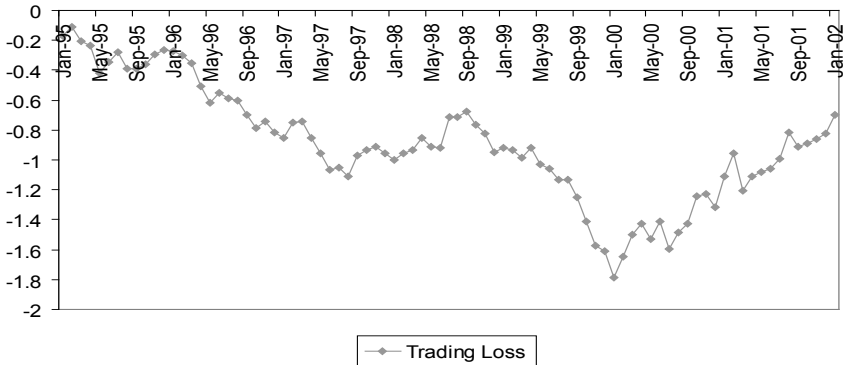
A regression analysis relating relative price to earnings and book value was undertaken (see Appendix for results). A variable to capture the presence of a founder on the board of the company was included and its impact on responsiveness of price to accounting performance measured.

One might expect companies retaining their founder to command a higher price for any given set of accounting fundamentals than those that do not. The failure of traditional accounting fundamentals to explain Internet stock price values is clear. In the basic specification including earnings and book values, before introducing a dummy for the founding entrepreneur (taking a value of one if the entrepreneur remains and zero otherwise), EPS has a negative sign. This suggests greater losses increase the price for Internet stocks. Fundamentals explain only 16% of the distribution of stock prices in the sector, leaving much to be explained by market sentiment or 'intangible' sources of value. One such source of intangible value is the skill and charisma of the founding entrepreneur. However, the results show little evidence that the retention of founding entrepreneurs within the firm adds value. Indeed these tests suggest that the retention of the founding entrepreneur after the IPO may induce statistically insignificant reductions in firm value. However, the collinearity between the book value and net income is already quite clear in the correlation matrix in Table 5.3. This dependence may affect the regression results.

Tests of the linear restrictions required to remove the conditions necessary to capture the effect of the founding entrepreneur on firm value are accepted at even higher levels of confidence than in the original specification. Such tests investigate the reduction in explanatory power from forcing all firms' stock-price to have the same relation to accounting fundamentals regardless of the presence of the founder. The hypothesis that the founding entrepreneur's retention on the board has no effect on Internet stock's value cannot be rejected for this sample.



Note: CAR = Cumulative abnormal returns (% shareholder wealth)



Note: Figures 5.1 and 5.2 measure daily losses/gains in shareholder wealth, relative to the NASDAQ index.

It appears that there is little evidence that retaining the entrepreneur raises the value of the firm relative to fundamentals. But it is already known that the relationship of Internet stock value to accounting fundamentals is tenuous at best and perverse at worst. So little economic significance can be drawn from this finding. In order to capture the effect of entrepreneurial talent on stock market value, regardless of accounting fundamentals, a final test compares the cumulative abnormal returns to holding a portfolio of stocks in which the founding entrepreneur remains on the board compared to a portfolio of stocks where the founder has already departed the firm. The results of this test are given in Figures 5.1 and 5.2, where Figure 5.2 shows the trading losses to a strategy designed to buy stocks in which the founding entrepreneur remains on the board, funding the purchase by selling short Internet stocks in which the founding entrepreneur has already sold up, i.e. the difference in cumulative return between the two portfolios shown in Figure 5.2. In both figures the loss of value associated with the retention of the founding entrepreneur is clear. The volatility in Internet stocks prices is sizeable within the sample period and it is not possible to reject the null hypothesis that the retention of the founding entrepreneur on the board of directors has no effect at all on company value.

Summary

The stock market value of retaining the founding entrepreneur on the board of directors of Internet firms was investigated for the period 1995-2000. Surprisingly, and somewhat counter-intuitively, no evidence of a positive effect, and weak evidence of a negative effect, of retaining the founding entrepreneur is found. This is puzzling, given the clear role of the founder in congealing so many elements of the intangible value of the firm. The finding is all the more intriguing given that few entrepreneurs will sell up if they remain confident regarding the future prospects of the enterprise to which they gave birth.

One possible explanation of the results presented here is that the prevalent 'winner-takes all' business model for Internet start-ups means

the fastest growing and most successful firms make funding requirements so great that the founders ownership stake is severely diluted. In this case success comes at the cost of control of the firm for the founding entrepreneur. To confirm this one needs to know more about the individual business histories of Internet firms. The relative youth and turbulent nature of the sector means that such history remains as yet largely unwritten.

The stock market performance of 50 'pure-play' US Internet stocks were analysed, distinguishing between those that retained and those that lost their founding entrepreneurs after the initial public offering. Statistically insignificant losses to those Internet companies retaining their founding entrepreneur were recorded.

Any confidence in this result must be tempered by a concern that the value of the 'pure-play' Internet start-ups bears little systematic, and perhaps a perverse, relationship to accounting fundamentals. The study in this chapter examined whether retaining the Internet company founder raised value relative to other firms, with similar accounting fundamentals, who had allowed the founder to depart. This assumes that the relationship between price and accounting performance forms a reasonable valuation basis. But for Internet companies this might not be the case. In particular, earnings seem to be negatively priced in the sample, suggesting profits are an indicator of poor future performance in the stock market for this set of firms.

While the tests based on accounting variables may be difficult to interpret confidently, the results produced by them are confirmed by a trading strategy test based on selling stocks where the founder leaves at, or before, the IPO and using the proceeds to purchase similar stocks where the founder remains actively involved in the company.

It appears that whatever benefits the founding entrepreneur brings to the enterprise, these have dissipated by the time the IPO comes. Upon floatation Internet ventures are seen as in need of 'adult supervision' and more flamboyant characters such as Jim Clark or Pierre Omiyar are seen

as a threat to a more commercial orientation by the company's investors. So the founding entrepreneurs may be the glue to hold the source of intangible value together in the early days of Internet ventures. But by the time that glue congeals into a publicly traded company they begin to look like a liability.

Somewhere along the way from start-up to mature growth the value to the Internet firm of the founder retention is lost. One reason for this may be that 'natural entrepreneurs' are suited to the high uncertainty/high profits environment of a start-up, but less able to cope in the low uncertainty/low profit context of a mature firm.

A more disturbing interpretation of the results of this chapter's study emerges from the way in which most Internet ventures attract capital. Since available capital is in short supply most start-ups attract merchant banks, lawyers, key employees and even other companies as collaborators by offering them equity in the firm. As the 'burn-rate' of the start-up proceeds the founders of the firm see their ownership stake eroded. The more growth opportunities made available to the firm the greater the incentive to fund them by diluting the owner's stake. At some point the founder become vulnerable to eviction by those wishing to reap the rewards of his or her initial vision.

The founding entrepreneur appears to be the unwanted, or at least unvalued, guest at the post-IPO party. The founder's control function will hopefully, henceforth, be exercised by a competitive capital market. But as the results of this chapter tells, this monitoring may not be performed in response to the normal accounting-based measures of performance such as earnings-per-share.

6 SUMMARY, DISCUSSION AND POLICY IMPLICATIONS

This report examined the sources of intangible value in Internet stocks during the period of the 1999/2000 bubble. In particular it focuses upon the visibility of the host company's site and the value of retaining the founding entrepreneur. A variety of evidence is provided concerning the value of these intangible assets ranging from the anecdotal to the statistical. What is clear from the study is that finding a tangible/countable measure of intangible value is not easy.

Under FRS 10 internally generated goodwill should only be recognised if it has a readily attainable market value. The research techniques of market-based accounting seem ideally suited to implying market values resulting from a highly visible website or retention of the founding entrepreneur. IAS 38 continues the prohibition on recognising internally generated goodwill, but allows recognition on the company's balance sheet if the asset's cost can be reliably measured and all economic benefits specifically attributable to the asset flow to the company. The standard also provides guidelines for determining if benefits will flow to the firm reliably (Vallabhajosyula, 2001). The failure of this report to uncover any clear link confirms the wisdom of not attempting to recognise intangible assets of this form in accounting for Internet ventures. Strangely a conservative, prudent, view might suggest the cost of retaining a founding entrepreneur after the initial public offering should be recognised by companies.

FRS 10 defines an intangible asset as follows:

An intangible asset is an identifiable non-monetary asset without physical substance held for use in the production or supply of goods or services, for rental to others, or for administrative purposes.

Both web-traffic and the founding entrepreneur's charisma satisfy this criterion and so qualify as intangible assets under FRS10 standard's terms. Since both the number of Internet site 'hits' and the founder's presence are clearly measurable it might be hoped a relationship to the market value of the firm might be demonstrable. While prior research in the US has suggested high web-traffic might raise the value of Internet stocks, this report was not able to replicate this result in the UK. One obvious reason for the difference in results is the small number of Internet ventures in the UK. Another is the shorter duration and intensity of the UK boom. Both these factors reduce the ability of web traffic to explain the variation in Internet stock prices. Finally, this report draws on only one year's web-traffic data to uncover a valuation effect.

Nevertheless, if having a popular site has a substantial impact on the host corporation's share price, that should have been uncovered in the study. The failure to do so may result from the combination of a small sample with a lot of within-sample variation in the type of company studied. Both the role and value of web-traffic varies according to whether the site host is an E-tailer or a portal. Even within the category of web-portals, such as AOL, the value-relevance of web-traffic depends on the particular business model that the site's host employs. A fixed monthly fee implies the need to maximise visibility and visits to the site, while a pay-for-view model implies a focus on premium price services.

Further, as previous research has shown, web-traffic is in many senses an outcome of a deeper more structural process of embedding a site in a variety of commercial and social networks. Much web-traffic derives from business alliances, cross-referencing from other sites and the allure

of meeting other users. Friendsreunited.com could expect few customers if it did not hold out a reasonable prospect of listing at least one person subscribers are likely to have known. Internet usage is inherently social in nature and it is hard to attribute or allocate the benefits of the social networks to individual sites. While web-based virtual communities certainly exist it is hard for any one firm to appropriate and claim property rights in their existence.

The fragmentation of property rights in the intangible 'community' produced by the Internet, combined with a surge of new entrants in response to the wealth produced, eroded producer profits as consumers grabbed the benefits of increasingly competitive markets. In this sense the collapse of the Internet bubble has not so much destroyed as re-allocated wealth.

Perhaps the primary losers of the collapse of Internet stock prices were the early innovators of the period. Earlier research has shown that E-entrepreneurs retain a larger proportion of equity in firms they found than founders of other ventures. This decision may be predicated on a belief that the emergence of the Internet as a commercial vehicle holds out unique opportunity. Ironically, greater opportunities bring increased funding pressures and consequently a greater dilution of the founding entrepreneurs' stake. The founder can often only attract new participants into the firm by offering an equity stake in his or her creation. But this very process makes the founder's position within the firm more tenuous and open to threat from new investors, especially merchant banks and venture capital vehicles. As the need for a 'steady-hand' to steer the post-IPO firm becomes clear, the founding entrepreneur becomes expendable.

Policy implications

Accountants are always on the look out for new performance metrics whose disclosure could enhance the value of financial reports. But to enhance the quality of financial reports the information provided must be capable of clear interpretation by investors. In this report the value for investors of information on the popularity of a host's site has been considered. No stable relationship to either price or 'true' value (at least as measured in financial reports) has been found. Formal public reporting of such data may run the risk of promoting trading as a signal with little fundamental value about the future revenues or profits of the firm. But web-traffic data may have a significant implication for value as part of the value-creation story, in partnership with information regarding business alliances, third party licensing and other business networks. The disclosure of web-traffic metrics may also be of use to government, regulatory or other stakeholders. This is particularly true because of the concentration of web-traffic noted in chapter two of the report.

Such information may already form part of the narrative Operating and Financial Review. Perhaps it can be better controlled by means of revised reporting guidelines. This is especially true since the guidance the ASB issues for the OFR specifically addresses potential risks to firm performance. Loss of key personnel certainly constitutes such a risk.

The focus of analysts upon the quality of senior management, particularly at board level, is nothing new and it seems unlikely that further disclosure is required in this context. It is perhaps this very focus that accounts for the desire of many Internet start-ups to replace their founder at, or before, the initial public offering. While the search for a safe pair of hands to steer the board of a newly public enterprise is understandable, the choice to remove the founder seems more difficult to justify. Perhaps that very ego which makes entrepreneurs successful in the first place makes them unable to accept 'adult supervision'. But the finding that stock markets seem to punish Internet companies

retaining their founding entrepreneur seems regrettable. Governance procedures to create a credible position for a retained founder would seem desirable.

R

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A PPENDIX A - RATIONALISING THE BUBBLE

Often, evidence that the Internet boom constituted an act of collective madness is presented as overwhelming, but the Internet ‘bubble’ may be seen as the outcome of trades by rational agents whose preferences over risky assets are best characterised by the ‘prospect theory’ of investor behaviour (Kahneman and Tversky, 1979).

Prior Literature

Moon and Schwartz (2000) presented an early attempt to explain the seemingly astronomically high levels of Amazon’s stock price using standard equations. Hand (2001, 2003) building on the theoretical work of Zhang (2000) showed that accounting losses were positively priced in the Internet sector. In Zhang’s (2000) model, accounting conservatism implied both increases and decreases in the return on equity that might lead to increases in the market to book ratio. Losses may be valued by investors if expensed research and development, brand value, or advertising, are seen as investments. Such a pricing of losses may be seen as particularly attractive in a sector where the ‘winner-takes-all’.

The structure of investment returns under the ‘winner-takes-all’ model of competition

A central tenet of the Internet is the need to dominate the chosen Internet space, be that music downloads, or Internet telephony. This creates a compulsion amongst hopeful entrants to build brand. Noe and Parker (2005) provided a simple model of what such a competitive process might look like, and many characteristics of the recent Internet

'bubble' are consistent with this rational, competitive play between firms committed to a 'winner-takes-all' strategy for success in their chosen Internet space. Such an example is the holiday/travel market and competition between Expedia and Lastminute.com. Huge losses in Internet start-ups reflected expenditure upon saturation advertising strategies, and were simply the cost of purchasing a call option on market-leadership. Only the market-leader could be assured of sustained profitability in an industry where the cost for users switching sites was effectively zero. Inevitably such a world is characterised by high volatility and skewness in financial returns. Noe and Parker (2005) compare such returns to those of 'out of the money' call-options on market leadership.

A more formal treatment of the Noe and Parker (2005) model

The static version of the model envisages a simplified world with competition between two firms (firm one and two). Competition occurs across two dates: a start-up investment date (date 0); and a later date on which a victor emerges (date 1). The race to invest occurs through attempts to improve the quality of the firm's Internet site, denoted by q . Advertising is deployed to raise awareness of that site's existence, denoted a . In this world, access to Internet sites is free, switching costs to consumers moving across sites are zero. Further, development costs incurred in establishing a site cannot be 'salvaged' if a competitor ends up being second best.

Customers choose the highest quality site of which they are aware in period 1, based on quality (q) and advertising (a). Firm revenue is a function of the number of visits, or 'hits'/traffic, on the site, itself a function of site (q) and (a). Customers only visit sites they know. If consumers know both firm one and two's sites, they choose between them based on their quality. Consumers stand randomly on a line from

0 to 1. Hence, if both firms advertise an equal amount and have sites of equal quality, consumers will be shared equally between them.

To grab the attention of all the customers in the site's potential market, even if they cannot retain their custom, one of the two competing firms must spend A , the market saturation level of advertising. Let R be revenue and assume R is greater than A . Each of the two firms spend a proportion $a_i A$ of the market saturation level of advertising, where a_i denotes the possibility a consumer will visit the site (even if they buy nothing).

Just attracting a customer's 'eyeball' is not enough to drive revenue, for that, a firm needs a high quality site. For simplicity, Noe and Parker (2005) assume that investments in quality at date 0, q , convert pound for pound into a higher quality site.

The structure of Internet companies' profits are common, with far more intensively studied auction markets. Firms 'bid' for customer 'hits' but these costs are sunk and not capable of recovery. Indeed, even to enter the auction for Internet traffic each firm has to incur sunk costs in the form of advertising, a_i . Both investments in advertising, a_i and the quality of the site, q only yield profits if the firm wins all the market.

In the market inter-reaction envisaged by the Noe and Parker (2005) model, each firm's control over its revenue is very constrained. Firms are unable to charge for content directly. Rather, each site needs to draw Internet traffic in order to generate revenue. So, providing content is not the key to unleashing revenue, for that the content has to be seen by as many eyeballs as possible. Secondly, the most popular quality site scoops the whole pool of revenue. This occurs because once a site is known, its relative attractiveness is determined solely by its quality, as recognised by a homogeneous set of investors.

The two firms play one of two strategies:

- a) a firm sets both advertising (a_i) and site quality (q), to zero; or
- b) a firm spends A , the saturation level of advertising, and invests q in producing a quality site.

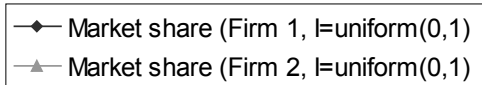
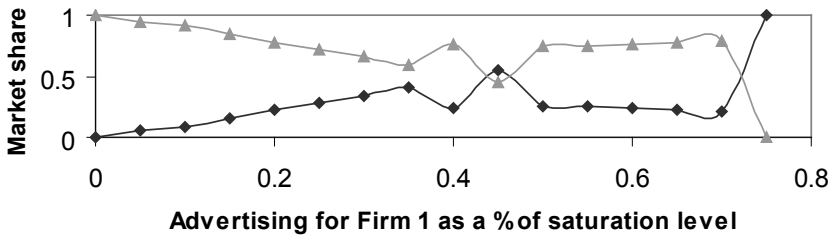
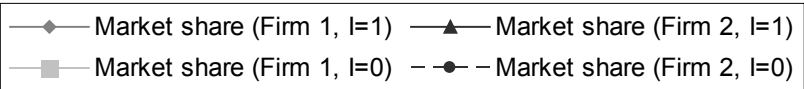
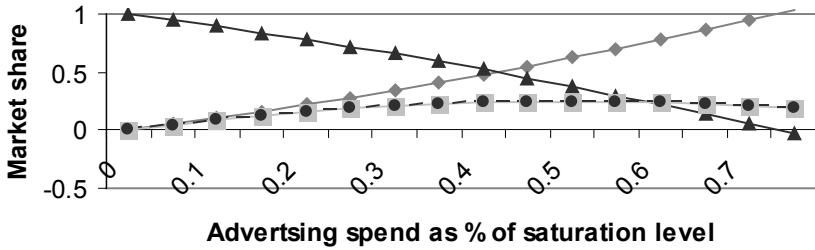
Under these strategies each firm faces one of three outcomes:

- (1) the firms simply do not even attempt to enter the market, in which case the investment is zero and the return on it zero;
- (2) the firms compete, lose, and waste all their investment; and
- (3) a firm might win and sweep the whole market.

This can be examined by considering a numerical example.

A simple numerical example

Consider the impact of advertising on market share in a static world, where either of the two firms can choose to invest in site quality or not. Each firm's plan is known in advance to its rival and this decision is signalled by setting an indicator variable I equal to one, if the firm invests in quality and zero otherwise. By considering increments in advertising of 5% by both firm one and firm two simultaneously, it is possible to trace the impact on market-shares. Increases in advertising expense increase the amount of Internet traffic each firm attracts and, therefore, its revenue.



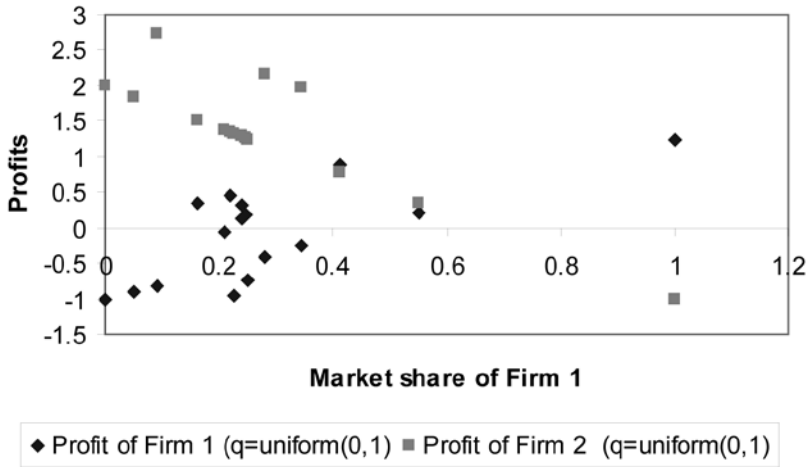
In this simple two firm numerical example the market share of firm two is simply the complement of firm one's share.

However, it is not advertising alone that determines each competitor's fate. Advertising revenue does not capture market share unless the firm also invests in a quality site. But doing so only makes sense if the rival firm does so as well. This leads to a 'mixed-strategy' in which each firm plays the strategy to invest in a high-quality site with some positive probability. This is captured by letting this choice be made by a random draw from the uniform distribution, setting the indicator to variable (q) to one if a draw is made to invest for the firm and zero otherwise. Two separate draws are made for each of the firms, so at each increment in advertising considered, either firm one may invest and firm two not, or both invest, or both fail to invest.

The effect of the randomisation of the strategy of investing in high-quality advertising expense and the amount of market share gained, results in increases in advertising expense being contingent upon the relative investments made in site quality by the two firms.

The market share, in response to advertising and quality expenditure, is reflected in the allocation of profits amongst the two competing firms. In this numerical example, revenue is set equal to 3, the required investment in a quality site, q , equal to 1. In the 'winner-takes all' equilibrium the winning firm takes a profit $R-A=2$. Once again profit two's function is simply the complement of firm one minus its own investment in site quality, which is assumed to be an independent process.

Figure A3 Noe and Parker (2005) Market share of Firm 1 and the distribution of Profits in a mixed strategy equilibrium over site quality



The randomisation of investments in site quality makes the relationship between market share, acquired through advertising, and profits earned highly non-linear and skewed. The most profits earned for firm two over the competitive outcomes considered in this numerical example occur when firm one either does not advertise, or if it does so, fails to capitalise on that investment with the provision of a high-quality site.

The numerical examples make clear that the distribution of profits is highly skewed in the Internet sector described by this model, with firms often making losses but occasionally making large profits if they can attain market leadership in a sector.

Why are investors attracted to Internet start-ups?

Noe and Parker (2005) make clear why the pattern of profits in Internet start-ups is so skewed. But this does not explain why that sector proved so attractive to investors. Recently, Barberis and Huang (2005) and Barberis *et al.* (2001) have built on the work of Kahneman and Tversky (1979) in the psychology of human decision-making (see also Tversky and Kahneman, 2000), using 'prospect theory' in decision-making under uncertainty to evaluate stock-market investments. In particular, it shows that investors can be attracted to securities offering a skewed return distribution because of their lottery like nature i.e. they offer a small probability of a massive pay-off, even if the return on average is far more mediocre.

The basic prospect theory

The original version of prospect theory was advanced as a positivist description of how people *do* make decisions, contrary to the Von-Neumann Morgenstern theory about how they *should* make decisions. Prospect theory splits decision-making under uncertainty into two discreet sequential phases. The first phase edits the decision to make it more easily processed in the next stage. The second stage is the evaluation stage in which the recently characterised decision is processed.

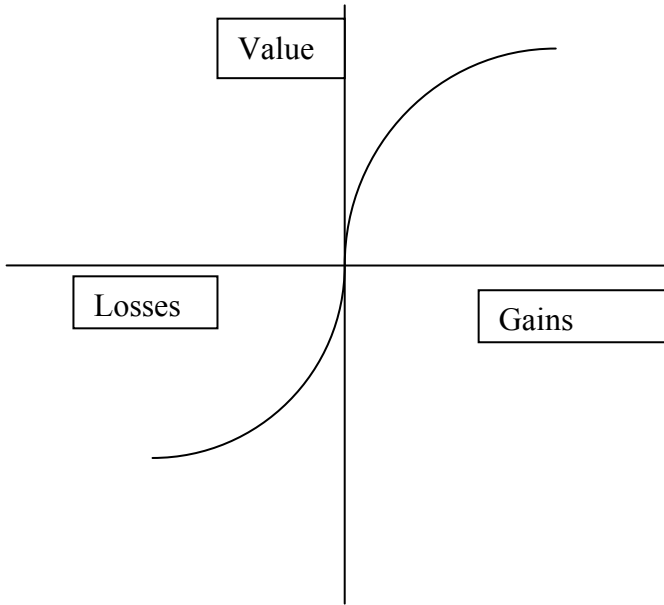
The value of an edited prospect, denoted V , is expressed in terms of two scales, a decision weight, π and the outcome it operates on v . Each probability p has a weighting π that is associated with it. In particular, decision weights may not sum to one over all possible events considered. Yet these decision weights measure the impact of events on the desirability of the prospects considered.

Prospects are decomposed into two parts:

- a) a riskless, or certain, part; and
- b) a risky prospect, or the additional gain, or loss, that the prospect involves.

Under prospect theory the value of any outcome equals the value of the riskless component plus the weighted difference between the possible risky outcomes. Note that the decision weight π operates only upon the value difference implied by the decision being faced, not the riskless part $v(y)$. Hence the metric for choice is *changes in wealth*, not the resulting *level of wealth* as incorporated in standard utility theory under the Von-Neumann Morgenstern axioms. This accords with the idea that a reduction in wealth from some level to which we have become accustomed is often particularly painful. This brings into the focus the need to isolate clear reference points of wealth, deviations from which are weighted by π in the prospect theory evaluation framework.

Figure A4 The 'S' shaped utility function of prospect theory



A central aspect of prospect theory is the recognition that the response to losses and gains in wealth is often asymmetric, with the former being felt far more keenly than the latter. The simplest reference point is often zero, or the current level of wealth. In the case of analysts forecasts of earnings De George *et al.* (1999) suggested a hierarchy of implicit benchmarks used by management which take the form:

- a) zero earnings, or the avoidance of losses;
- b) last year's/quarter's earnings, or the avoidance of declines in earnings;
and
- c) the outstanding consensus forecast.

Recently, Brown and Caylor (2005) have confirmed that since the mid-90's in the US the media attention given to analysts has made conformity to these benchmarks more pressing.

Prospect theory's application to finance

This area of behavioural finance has grown apace, at least since De Bondt and Thaler's (1985) path-breaking work with its implicit basis in the representativeness heuristic of Kahneman and Tversky (1979). Recently, a more formal attempt to model the impact of psychological bias on asset pricing has begun. A land mark paper in that development is Barberis *et al.* (2001). Barberis *et al.* (2001) expand this framework to account for the fact that recent gains in financial wealth may make investors less risk-averse, or more risk-loving. Similarly, recent losses may make investors more risk-averse.

The impact of these changes in wealth, X , reflects not only their relative size, but also the size of the investors' current holdings of risky assets in their portfolios and a variable, capturing the impact of past gains and losses on the change in utility from a present loss/gain, X_t .

The incorporation of past losses and gains into an investor's utility does not necessarily require any irrationality on their part. Indeed, it may simply reflect a prudent revision in an investor's belief in his or her ability to invest wisely. Investors who have recently made huge losses may not unreasonably feel more risk averse as they stand to lose all.

Benchmarks, gains and losses and the dynamics of utility under prospect theory

Discussions of gains and losses implies the existence of some implicit benchmarks for what is 'normal' or 'expected'. One simple benchmark of expected wealth is simply current consumption or wealth. This implies a zero change in wealth and is the reference level from which departures are

measured. In contrast to this, Barberis *et al.* (2001) suggest a reference level of growth in financial wealth to be growth at the rate of the risk-free rate. This implies that if investors find out they have earned less on their stock market holdings than on building society or post-office accounts, they might feel slightly cheated.

There are three conceivable ways in which recent changes in wealth may impact on current utility:

1. No impact, because financial wealth has not changed much recently. In the absence of prior losses, investors are far more sensitive to losses than to gains. In the terminology of behavioural finance investors are loss averse;
2. Recently, investors have had declines in financial wealth below their benchmark level. In this case, losses are cushioned by prior gains in their impact on the investor's wealth. Perhaps they feel 'they had it coming' after the recent good times; or
3. Recently, investors have had increases in wealth and feel able to take extra risks with the 'house money' acquired in recent successful trades.

The weight put on current losses becomes a weighted average of past losses and the extent to which they aggravate any current loss, X_t .

Cumulative prospect theory and asset pricing

Often investors overweight the tails of the distribution, expressing a preference for skewness in the return distribution. Recently, Barberis and Huang (2005) have used these properties of prospect theory as a way of understanding a number of disparate anomalies in financial markets, for example, IPO under-pricing and the implied volatility 'smile' of out-

of-the-money options. One possibility is that the 'lottery' like nature of stocks engaged in 'winner-takes-all' competition within an Internet sector made them more enticing to investors. Barberis and Huang (2005) show that a security with a skewed return can become overpriced, offering a negative average excess return. Even in an economy populated by investors with homogeneous preferences (such as that envisaged in the CAPM world) some investors may choose to take a large undiversified position in the skewed security. They do this because by doing so they convert some of their contingent claims into lottery-like claims on future wealth. Because their utility function is constructed under the axioms of cumulative prospect theory this outcome seems attractive to them. This property of a skewed return distribution is so valuable to some investors that they are willing to pay a high price to obtain the security, even at the expense of receiving a return that is on average negative.

The preference by investors for a skewed investor return has been examined by a number of authors before. The unusual point is the preference for an idiosyncratic skew for a single stock rather than skewness in a diversified portfolio's return.

A PPENDIX B - COMPARISON OF POPULAR-PERSISTENT AND UNPOPULAR-TRANSIENT

This appendix presents some additional data on the Jupiter Media Metrix sample used.

Table B1 Descriptive statistics for Jupiter MMXI web-traffic report for year 2000 by frequency of appearance in monthly reports

Panel A: Firms appearing in all months in year 2000 Media Metrix report								
Month	N	Mean	Median	SD	SD/Mean	Skewness	Kurtosis	Shapiro-Wilk
Jan	50	595.04	248.00	878.50	1.47	2.70	7.46	0.59*
Feb	50	693.00	272.00	1004.57	1.45	2.86	8.81	0.59*
March	50	731.86	274.00	1058.12	1.05	2.81	8.53	0.59*
April	50	737.18	275.50	1109.59	1.50	2.88	8.81	0.57*
May	50	781.24	304.50	1141.42	1.46	2.80	8.33	0.57*
June	50	830.08	316.00	1229.86	1.48	2.84	8.73	0.58*
July	50	884.32	404.00	1245.17	1.41	2.79	8.45	0.59*
August	50	887.84	422.00	1254.75	1.41	2.88	8.98	0.59*
September	50	860.02	373.00	1246.54	1.5	2.90	9.07	0.59*
October	50	1040.64	452.50	1482.95	1.42	2.81	8.61	0.60*
November	50	1048.62	424.00	1493.50	1.42	2.93	9.82	0.60*
December	50	1028.01	415.22	1511.69	1.47	2.99	10.03	0.58*

Note:

* Significant at the 95% level of confidence.

Table B2 Descriptive statistics for Jupiter MMXI web-traffic report for year 2000 by frequency of appearance in monthly reports (Continued)

Panel B: Firms appearing in 11 months of year 2000 Media Metrix report								
Month	N	Mean	Median	SD	SD/Mean	Skewness	Kurtosis	Shapiro-Wilk
Jan	24	170.83	163.00	78.52	0.45	1.40	1.68	0.83*
Feb	32	270.69	171.50	330.71	1.22	3.76	15.12	0.48*
March	32	289.34	199.50	285.33	1.01	3.14	10.99	0.58*
April	31	255.58	199.00	196.98	0.77	2.27	4.34	0.65*
May	33	263.58	190.00	220.71	0.83	2.50	6.00	0.64*
June	33	265.18	187.00	230.80	0.87	3.01	9.69	0.58*
July	33	295.85	240.21	240.21	0.81	2.68	7.48	0.64
August	33	298.36	213.00	265.32	0.88	2.46	5.83	0.62
September	33	267.61	188.00	223.97	0.83	2.87	8.78	0.60
October	32	317.34	235.50	280.23	0.88	3.03	10.09	0.62*
November	29	320.83	320.83	299.47	0.93	2.48	5.86	0.64*
December	18	384.25	258.22	312.63	0.81	1.93	2.89	0.70

Panel C: Firms appearing in 10 months of year 2000 Media Metrix report								
Month	N	Mean	Median	SD	SD/Mean	Skewness	Kurtosis	Shapiro-Wilk
Jan	17	200.58	181.00	114.55	0.57	1.28	0.94	0.86*
Feb	15	287.27	165.00	284.75	0.99	2.46	5.84	0.62
March	15	553.00	184.00	972.28	1.76	3.15	10.40	0.50*
April	20	521.80	189.00	847.40	1.62	3.26	11.67	0.52
May	23	485.91	221.00	823.18	1.69	3.79	15.69	0.46
June	22	510.23	209.50	867.49	1.70	3.53	13.69	0.48*
July	23	533.13	243.00	879.70	1.65	3.72	15.19	0.48*
August	23	543.17	225.00	892.38	1.64	3.54	13.79	0.49*
September	23	517.96	209.00	888.99	1.72	3.57	13.91	0.48*
October	20	700.40	283.50	1113.65	1.59	2.89	8.71	0.55*
November	17	728.47	300.00	1121.95	1.54	2.74	7.71	0.58*
December	12	833.94	272.49	1367.57	1.64	2.49	6.00	0.57*

The skewness of sites appearances towards a minority of persistently popular sites, swamped in a mass of sites of transient interest is clear.

Figure B1 Number of monthly appearances by sample firms in Media Metrix rankings in year 2000

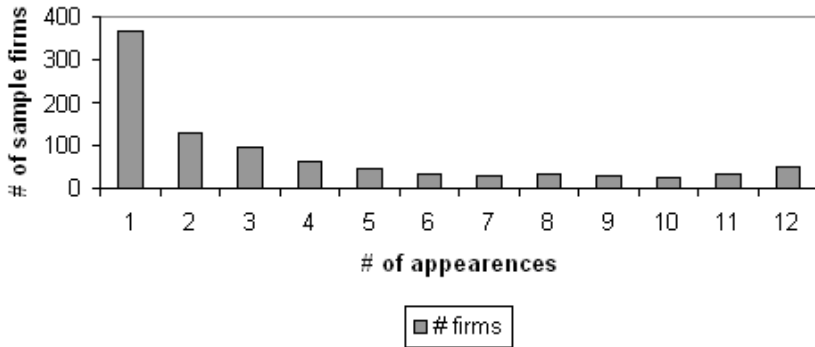


Table B3 Portfolio returns to popular and unpopular website

Month	ACAR (all firms)	ACAR (popular)	ACAR (unpop)	T-test (all)	T-test (pop)	T-test (unpop)
Feb	0	0	0	0	0	0
March	-0.05824	0.001201	0.078203	-0.72742	0.020629	0
April	0.113569	0.001412	-0.08477	1.418566	0.024255	0.943213
May	-0.07498	-0.01071	-0.09624	-0.93654	-0.18397	-1.02246
June	-0.09217	-0.01318	0.002676	-1.15123	-0.22632	-1.16076
July	-0.05182	-0.00895	0.019668	-0.64731	-0.15371	0.032277
Aug	-0.00604	-0.00805	-0.07682	-0.07547	-0.13826	0.237217
Sep	-0.07343	-0.14017	0.031767	-0.91723	-2.40782	-0.92658
Oct	0.008297	-0.03283	-0.01401	0.103635	-0.56386	0.383139
Nov	-0.0628	-0.06368	-0.05706	-0.7844	-1.09383	-0.16899
Dec	-0.11921	-0.07779	-0.09875	-1.48901	-1.33633	-0.68819

The Boys in the Bubble: Searching for Intangible Value in Internet Stocks

This report studies the internet boom in the late 1990s and its subsequent collapse in 2000. The dissemination of internet access was an enormous societal and economic change, and this industry continues to be an innovator of new ideas, with current developments such as YouTube, Facebook and MySpace. The debate on how to value internet businesses continues and this report seeks to further knowledge in this area by studying two possible sources of intangible value for Internet firms – web site popularity and the retention of the founding entrepreneur.

The report undermines the claim that web traffic is a useful valuation technique and predictor of future revenues and finds that the retention of a founding entrepreneur after the initial public offering can adversely affect firm value. This raises interesting questions for the wider business community as to whether the skills of entrepreneurs lend themselves to the ongoing management of businesses.

Professor Forbes teaches at the Business School at Loughborough University. His main areas of research are in market-based accounting and behavioural finance. He has recently applied this literature to valuing new economy ventures

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