

Valuing Internet Businesses

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Is there a bubble in internet stock prices, or has the new economy changed the rules of stock valuation? In this article, the authors argue that the old rules still apply. The only way to test the reasonableness of new economy stock prices is to model the company's ability to generate cash in the future. This analysis also allows the development of a view about the performance that would be needed to justify current valuations. The analysis suggests that many internet valuations are stretched. Investors are focused on growth prospects for the firms, but realistic analysis about future profitability has been neglected in what will be an increasingly competitive world. Further, investors' assumptions that the new economy businesses will not require assets are unrealistic in many cases. Finally, because some new economy stocks are overvalued, there is a risk of misdirection of productive resources.

There is unanimity about the transforming potential of the internet, and we are impressed by the accompanying throng of, often youthful, internet millionaires. But

the youthfulness of the businesses themselves is disconcerting. Most are so new that they have few revenues, no profits and, in some cases, little prospect of profit. Nonetheless, they are rapidly brought to the stock market where they achieve prices way in excess of many profitable and well-established industrial companies. As a result, schizophrenia has developed about the internet. For some people, the word 'internet' has become synonymous with fool's gold. There is a widespread view that internet stocks are wildly overvalued and that current prices reflect a price bubble that must burst.

So far, there is no sign of this scepticism about internet valuations inhibiting the progress of the technology or the flow of projects to market. But it has led many people to argue either that financial markets are no longer efficient, or that we simply have to abandon our existing frameworks for valuing businesses.

In this article we critically examine the valuation of internet stocks. We argue that the existing valuation framework remains completely appropriate – indeed the only way to make sense of these businesses is to attempt to forecast their cash flows. The fundamental challenge is to form reasonable expectations, both about each firm's potential for growth, but also about its potential to earn profits. We show that the valuations of these businesses are very sensitive to margin assumptions. Growth-centred debates about internet stocks often implicitly assume that the competitive landscape will be benign. However, arguably, the internet will increase the competitive pressures on margins, making the new economy a very difficult place to earn profits.

Section 1 discusses the evidence for a 'bubble' in internet stock valuations and what this implies about market efficiency. Section 2 suggests a framework for valuing these businesses by forecasting their cash flows. Section 3 is a critique of the view that new economy valuations are justified because these businesses generate cash flow from using negative amounts of net assets. Section 4 discusses the central issue of how these businesses will create and sustain competitive advantage, and argues that the ability to earn profit is a missing piece in many internet valuations. Section 5 uses the examples of Amazon.com and Freeserve to show how the framework can be used to explore the valuation of internet stocks. Section 6 concludes.

1. Is There a Bubble?

We will say that a 'bubble' occurs when assets trade at prices significantly above fundamental values (fundamental value is normally defined as the present value of future cash flows to investors). Commentary in the financial press is now almost unanimous in arguing that many internet stocks are overvalued. Perkins and Perkins(1999) claim that the sales and earnings growth rates implied by current internet stock prices are "unparalleled in financial history". They quote Jim Breyer of venture capitalist Accel Partners: "It's emotion, it's frenzy, it's the fad, and 90 percent of the companies should never have gone public and will go out of business and hit hard times".

Internet stocks are now being included in popular discourse as one of the great bubble assets of history, alongside the tulip bubble in seventeenth century Holland (see below), the South Sea bubble, the US stock market boom of the 1920s, the US growth stock craze of 1959-1961, and the high-tech boom of the early 1980s (Shiller 1989).

Are current expectations reasonable or is there an internet price bubble? Since we cannot know the future, pricing stocks is a probabilistic, not a deterministic, affair. It is about expectations, not certainty. Concrete examples of the relative valuations of old and new economy businesses that have attracted such controversy are set out on the next page. The very high price-to-sales and price-to-earnings ratios of the new economy businesses looks like prima facie evidence of a bubble. It is not. As would be expected during such an intense period of innovation, we are seeing a lot of start-up and early-stage businesses. A high ratio of *expectation* to *achievement* is inherent in businesses at this stage of development.

Figure 1 charts the Nasdaq and UK TechMark indices against the Dow and the FTSE respectively. Particularly over the six months to February 2000, prices of technology stocks have soared while old economy stocks have simply marked time. Again, the pace of increase in prices may suggest a bubble, but it could also be explained by a rational change in

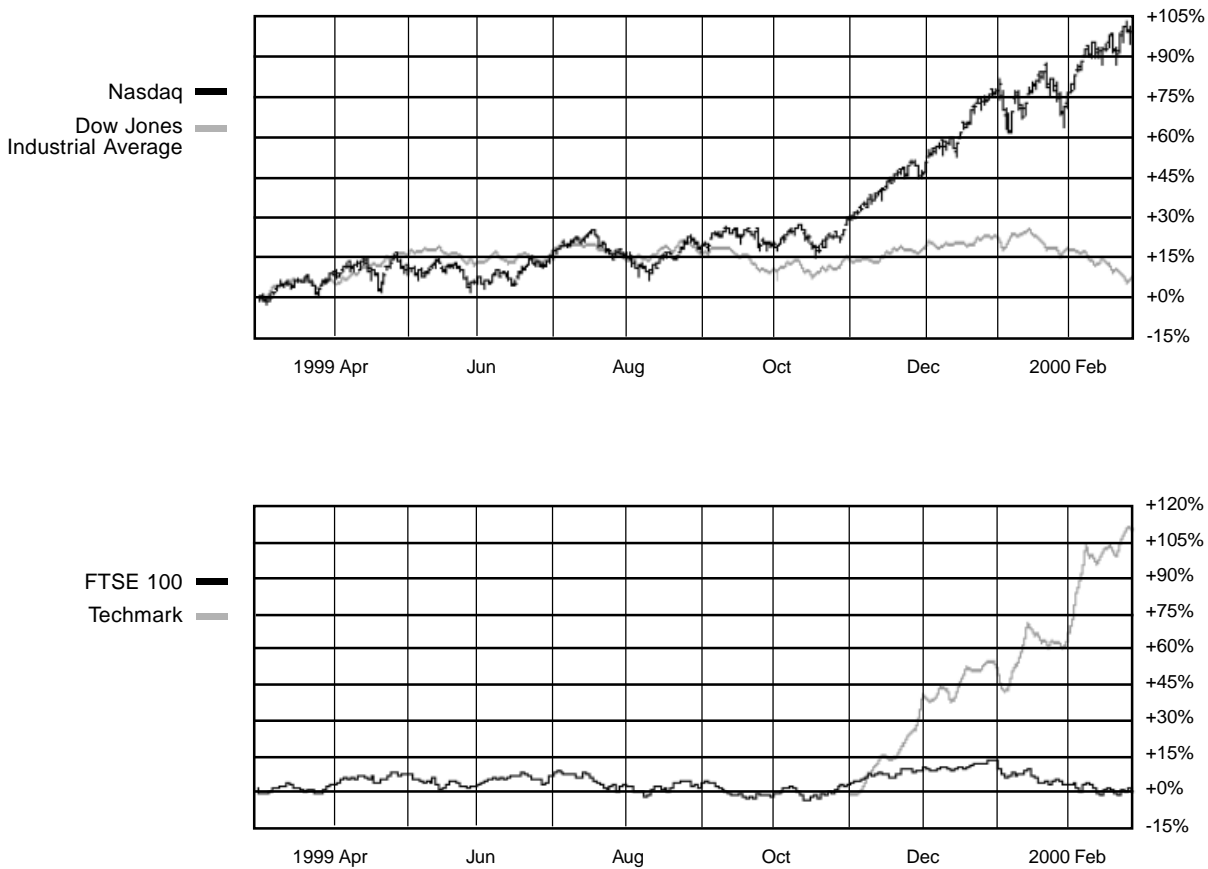
Tulips

Between 1633 and 1637 the price of tulip bulbs rose to extraordinary levels in Holland. At the peak, shortly before the bubble burst in 1637, one bulb was sold for 5200 guilders. At that time the average annual wage of an artisan was 250 guilders. Of course seventeenth century attitudes to tulips are rather hard for us to appreciate. They were prized above any other flower and were particularly coveted by the very rich, and most notably by the Ottomans. Moreover, some of the most admired varieties were extremely scarce and tulips are not quickly replicated. So the issue is perhaps not so much one of intrinsic value as of process. As prices rose the bulbs were bought not just by their natural owners (the rich tuliphophile)

but also by people of more modest means who merely bought because prices were rising and they expected to sell at a higher price. These people were 'momentum traders'.

According to Dash (1999) "For a while, at least, everyone made money. And that attracted more novice florists to the trade. ...Most had little access to money...florists paid in tools, clothes and household goods if they were artisans, farm animals or crops if they were farmers." However, "The collapse of the tulip trade after 3 February (1637) was so complete ... that where tulips could be sold at all, they fetched at best, just over 5% of their old values, and often 1% or less."

Figure 1
Recent Performance of High-Tech Stocks



Relative values: old and new economy

- In February 2000, the auction-based travel website *priceline.com*, most of whose revenue comes from reselling airline tickets, had a market value of \$7.5bn. It had revenues of \$313m and a loss of \$142m in the nine months to September 1999. This is more than United Airlines (\$2.9bn capitalisation on revenues of \$13.55bn and earnings of \$0.4bn) and Continental Airlines (\$2.1bn capitalisation on revenues of \$8.64bn and earnings of \$0.3bn) combined.
- *Amazon.com* had a market capitalisation of \$22bn on annual revenues of \$1.6bn and losses of \$0.4bn, compared to its offline competitor *Barnes and Noble's* capitalisation of \$1.3bn on revenues of \$2.2bn and profits of \$25m.
- In the UK, *Freeserve*, started by Stanley Kalms' *Dixons plc*, was valued at over £7bn at end. *Dixons*, which still includes its 80% stake in *Freeserve*, had a market capitalisation of £6.5bn.
- *The Financial Times* (19 Feb 1999) reported that *Whitbread* (turnover £3bn, pre-tax profit £366m) whose market capitalisation has dropped to just over £2bn, was likely to be replaced in the FTSE 100 by *Baltimore Technologies* (turnover £21m, forecast loss £20m) whose capitalisation had risen in twelve months from £78m to over £4bn. *Baltimore* is an "e-Security" company specialising in public key infrastructure, a technology that enables encrypted communications.

investors' expectations about the rewards to investing in technology sectors.

The only way to judge these prices is to assess whether they embody reasonable expectations about the future growth and profitability of internet businesses. Perkins and Perkins (1999) carry out a simple simulation. They project profit and revenues for 50 large quoted US internet companies. They base their predictions of margins on traditional companies in the industry – eg retail 5% based on Barnes and Noble (2% net margin), Walmart (3%). Revenues are projected forward for five years using a 65% revenue growth projection. Perkins and Perkins conclude that the large US internet companies are overvalued by just over 30% assuming revenues grow at 65% compound, and overvalued by 55% using a 50% revenue growth projection. Their conclusions are based on June 1999 market capitalisation, but since then the Nasdaq composite index has increased from 2400 to 4400, further increasing the suspected overvaluation. The assumption of compound revenue growth of 65% for five years is very optimistic, and is unlikely to be achieved by all firms, based as it is on the growth rates of Microsoft, Oracle, Dell, Sun and Cisco, which are some of the most successful companies in corporate history. Also, it does not reflect customary behaviour of start-up companies, where very fast initial growth tends to tail off. Nonetheless the results suggest that, even on what seem to be generally optimistic assumptions about the future, these stocks are overvalued.

If there is a bubble in internet stocks, where is the efficient market? Sustained and systematic mispricing appears inconsistent with what we believe to be fundamentally efficient equity markets. However, fads or bubbles can persist even in a market containing plenty of rational investors. Because it is hard to predict the end of a bubble, the expected risk-adjusted returns from selling into a bubble may not be high. Shiller (1989) notes:

“Some people seem to think that there is a theoretical argument (against bubbles...But) such fashions or fads may not create spectacular profit opportunities if the future paths of the fashions or fads are not very predictable...Consider those people who, in the late 1950s and the early 1960s in the United States, thought that the bull market had gone on too long and that stocks were overpriced. Even if they knew that the market

would eventually fall, there was no way for them to get rich quickly from this knowledge. They had to wait years to be vindicated; they could not predict when the bull market would end”.

2. Modelling the Value of Internet Businesses

Multiples of price to sales and price to earnings can sometimes be helpful in valuing mature businesses, but are less helpful in valuing internet (and other early-stage) businesses. Instead the investor has to try to model the future; to form a view about future growth and profits and their implications for cash flow. This is not easy. In mature industries, although we face uncertainty about future technology and about the future competitive landscape, the assumed range for sales growth forecasts is usually rather limited. With new economy businesses, we must also make big guesses about the nature and size of the market. Nonetheless there are powerful insights to be gained from attempting to develop expectations and to put reasonable bounds on current values.

The appropriate framework is free cash flow valuation. The value of a company depends on the *free cash flow* it is expected to generate in the future and which is available to distribute to investors. A company's free cash is its operating profit less taxes, less the cash it must reinvest in assets to grow. Operating profit is a function of the size of the company's market, its share of that market, and of the profit margin on those sales. A company 'creates value' when expected free cash flows imply a rate of return which is greater than the investor's required return. In competitive markets companies can expect to earn only a fair return on capital. They will create value only if they can create and sustain *competitive advantage* in the markets which they serve.

A combination of scarcity and aesthetics gives some oil paintings, some houses and some tulip bulbs an intrinsic value that commands a high price. The logic of free cash flow valuation dictates that there are no aesthetics in valuing stock. We assume that all the investor can consume from a business is cash. Cash is cash, cash has no odour and one company's cash is a perfect substitute for any other. So the free cash flow model is universal and applies equally to the new as to the old economy.

Free cash flow is a function of the company's sales and the profitability of those sales. Equity investment

houses distinguish between 'growth' and 'value' investment styles, with growth investors focusing on revenue growth and value investors tending to focus on profitability. For most of the current bull market, growth investors have been in the ascendant and value investors have been in retreat. However the distinction between growth and profitability is one of emphasis. No one has seriously articulated a world in which size without profit creates value.

The steps in modelling the cash flow of any business are as follows. The first is to forecast its sales, which will be a function of the size of the market and its share of that market. For example, Amazon initially targeted the, relatively mature, books market in the US (total size, about \$30bn), with world-wide books (about \$90bn) as a secondary target. But recent brand extensions by the company into CDs (US market about \$14bn) and auctions (potential market size uncertain) show how potential market size can become difficult to estimate, partly because it depends on future management strategy.

The second step is to forecast its costs, and the final step is to forecast its investment in its balance sheet as it grows.

Modelling costs is particularly important for internet businesses. Typical of startups, internet businesses often have revenues but no earnings. Some have few revenues. If these companies have value it is because of a belief that revenues will eventually exceed costs. There may be high initial costs, or costs may have a large fixed component and the company will only become profitable after sales exceed these costs. It is often argued that the earnings of these businesses are depressed because they expense marketing and customer acquisition, and development costs, which are by nature intangible investments, whereas the 'old economy' business would capitalise expenditure on tangible assets. The modelling issue is whether these costs will persist, and at what level. Competitors may force continued evolution of websites, continued expenditure on customer retention, and so forth.

When modelling any business to a long horizon, 'single value' forecasts of revenues and costs make little sense. The investor has to model a range of outcomes, and attempt to weight their probabilities. Given the great uncertainty in modelling internet businesses the range of outcomes may be very wide. By calculating the

average value across a range of outcomes, the investor attempts to capture the 'real option' nature of the investment. Since equity has limited liability, the worst case is the loss of the investment. But, albeit with low probability, there may be some states of the world in which the company is very valuable indeed.

Two issues in internet valuation need to be discussed in greater detail. One is balance sheet structure: what investment in net assets will the company need as it grows? The other is profitability: will the business create and sustain competitive advantage?

3. The Gravity-free Balance Sheet?

Some businesses need few, or even negative, net assets. The latter include some advertising agencies; some manufacturers who have re-engineered their balance sheets, such as Dell; journal publishers who are able to extract subscriptions from customers years ahead. Typically these companies show negligible tangible fixed assets, either because they do not use them, or because they lease them. They enjoy favourable working capital economics, getting cash from customers well before they have to disburse cash to their creditors. Most companies need to invest cash to increase their assets as sales grow. The beauty of a company with negative net assets is that it can use its balance sheet to generate cash, and thus create value, as it grows. This is because increases in revenues enable the company to receive cash from customers without immediately paying suppliers.

The 'gravity-free' balance sheet is sometimes claimed to explain current internet valuations, for example, by Mauboussin and Hiler (1999):

"We disagree with the consensus view that hype and hysteria drive the highflying valuations of internet stocks. ...Earnings for an internet company can substantially understate the company's total free cash flow..(because) the balance sheet of a New Economy company can unveil an important source of cash....What is obvious is that many Internet companies are currently incurring losses as they spend millions on marketing, while their off-line competitors reap cash earnings. What is less obvious is that New Economy companies spend much less on their computers and office space than Old Economy companies spend on bricks-and-mortar and working capital."

The authors cite Amazon which in 1998 “generated a net of \$54m from its balance sheet, coming very close to achieving positive cash flow” (its loss for the year being \$58m).

As in much else, Amazon is the ‘poster child’ here. Certainly, in 1998 Amazon had an efficient balance sheet, with buyers paying for books immediately via credit card while suppliers were paid later. Amazon’s net assets in that year were minus 10% of sales. The value created if this balance sheet model were sustainable is readily calculable at about \$4.6bn, based on the standard formula for a growing perpetuity and some assumptions about the decay of Amazon’s growth rate. (The \$4.6bn figure is calculated by taking the 1998 to 1999 revenue growth of 169% as a starting point, then assuming a revenue growth decay of 44%, declining to a 30% mid-term revenue growth. Two months “free credit” per annum on sales growth is assumed. These cash flows are discounted at a cost of capital of 20%. Terminal value was taken at a multiple of 20 in year eleven.) This is a substantial amount, but not *on its own* enough to justify Amazon’s current market value of \$22bn. In the event, Amazon’s negative net assets disappeared the very next year, as the firm invested in brick and mortar warehouses, and in systems. Net assets were plus 20% of sales in 1999.

Other examples:

- *Business applications software* and *electronic security* companies must make large upfront investments in development expense, and invest heavily in human capital. Given that most of their customers are businesses, they suffer from long payment terms.
- *Portals*, which spend upfront on development (paid to employees in advance of product release) and brand building (paid in arrears on business terms), while receiving revenue from advertising (business payment terms), are at best capital neutral.
- Other internet businesses that require capital are e-tailers who ‘fulfil’ rather than merely acting as a conduit for orders, and the subset of auction houses which act as principals rather than agents (and so hold inventory).

Some new economy businesses will need few assets of any kind, and others will make large investments in intangible assets rather than tangibles. Though

negative net assets is a seductive model, there are few such companies in the old economy and probably will be few in the new economy, so we doubt that this can explain a large part of the valuations we are observing.

4. The Potential for Profit

The internet is creating new markets and radically re-engineering many old ones. Hence in the discussion of internet businesses there is a natural preoccupation with potential market size and market share, and with the very wide range of values that predicted growth may take for these businesses. But growth is not enough. Growth is valuable only if the company is earning a return that is greater than its cost of capital.

In evaluating any business, investors should always start with a strong presumption that markets are competitive and that companies will simply earn their cost of capital. The challenge is then, ‘convince me otherwise’. Instead, the fledgling analysis of the new economy often seems to make the vital but unstated assumption that the environment will be benign in terms of profitability.

We frequently encounter two powerful myths of value creation:

Margin resilience. Competition will constantly tend to drive a company’s return on capital towards its market-determined cost of capital. The return on capital is a function of the assets it must employ to support its sales, and the profit margin on those sales. In other words the profitability equation is

Return on Capital = Operating Margin x Asset Turnover

Though companies will innovate and strive to increase the asset turnover, broadly, asset turn is a ‘given’ of the business model and of the technology (for example, low for capital-intensive industries such as airlines, high for service industries). Margin is the balancing factor. Hence, high asset turn (low capital) businesses must expect lower margins. It makes no sense to apply margins from one technology, or from one competitive setting, to another.

Customer retention. Quite frequently online businesses build up large customer or subscriber bases by penetration pricing (or, in the limit, by offering free services). If the business is then valued on a multiple of customers, the assumption is that these customers, disloyal to their previous supplier, will be faithful in

future. By extension, 'sticky' websites and strong online brands will ensure that rivalry is conducted on website features and the desire of consumers to be part of an online community, rather than on the basis of price.

However, most industries are competitive. For example, the main players in UK food retailing have enjoyed large shares of a large market. Unfortunately, they enjoy modest, and currently declining, market capitalisations, and have for many years earned a return on capital that barely exceeds the investors' required return. This is a competitive industry in which innovation is immediately copied. The customer is the winner. On the other hand, the absence of substitutes for many patented drugs has permitted the pharmaceutical industry to sustain high margins and very high rates of return for decades. In a similar way we must expect many segments of the new economy to be strenuously competitive, while in others participants may be able to create significant value.

The current challenge facing investors in the new economy is to develop their understanding of its competitive landscape; the sources of competitive advantage and the strategies which will succeed in the new world.

One vision of the future suggests that falling search costs will intensify competition still further in many markets. The internet is likely to significantly increase the transparency of offline as well as online markets by reducing the consumer's search costs. Some commentators envisage an "auction economy" where consumers tender for their purchases rather than paying the price shown in the store. As an example, the concept of a list price for a car is already under threat. Hamel and Sampler (1999) put it thus:

"Imagine a world in which you put your weekly grocery shopping out to bid...Customer ignorance – about prices and relative product performance – has been a profit centre for many companies. But consumers are about to get much, much better informed – and the consequences will be awe inspiring"...

"Let's be clear: In frictionless capitalism nobody makes any money! So how are people going to survive in the so-called New Economy? Well, ultimately the same way they survived in the old economy – through relentless innovation,

unparalleled service, and an attitude of genuine helpfulness, but delivered in new ways. To thrive in a Net-centric world, a company is going to have to offer consumers products with real performance advantages."

By contrast, network effects are a frequently quoted potential source of value for some firms. Examples of network effects are seen in the creation of markets (eg eBay) and communities (eg AOL). "Metcalfe's Law" suggests that the value of a network is equal to the square of the number of people using it. So networks may create for the incumbent both a valuable asset and a powerful barrier to entry. Lucier and Torsilleri (2000) suggest, however, that network effects are rarer than commonly believed, and only occur when there is value in connecting people, value above and beyond normal economies of scale, and value which is salient to the business rather than peripheral. They argue no network effects for direct selling (Dell, Schwab) or retailing (Amazon). And Benaïm (2000) points out that even if a network becomes valuable this value may not be proprietary. The fax network is valuable, but no-one owns it. The benefits have overwhelmingly gone to consumers.

5. Modelling Internet Businesses: Some Examples

The approach to modelling outlined in the previous sections has four main steps:

- Estimate the future market size and predict the company's revenues.
- Project the company's costs.
- Forecast the company's asset needs.
- Check the forecast to ensure that the predicted market share is plausible and, if supernormal returns are being earned, that the source of the company's sustainable competitive advantage is clear.

To illustrate it, we study Amazon.com, and also Freeserve from the UK. We choose Amazon because it is without doubt the most discussed internet stock at present, and we are able to contrast the results with a recent valuation by Desmet *et al* (2000) in *The McKinsey Quarterly*.

Amazon

The modelling is based on Amazon's published accounts for 1996-1998, and its unaudited 1999 results.

The first step is to forecast *revenues*. We noted earlier the difficulty of ascertaining Amazon's future market size. Morgan Stanley's Mary Meeker (2000) suggests that the company's global market at Feb 2000 is \$1,600bn (including auctions \$600bn, consumer electronics \$304bn, and home improvement \$496bn). However, competition and scarce management resource must limit the company's growth. Figure 2 suggests that Amazon's revenue growth has been exponentially declining. (The graph is of log growth. A horizontal line would imply a constant rate of growth.) The trend (including the spurt in last quarter 1999) is that growth decays to 44% of its value one year before. What level of growth is "sustainable" for the medium term? We assume that Amazon is, at some level, an "excellent" company and take comparators accordingly: Microsoft and Walmart. Microsoft's revenue growth is very product cycle dependent, but seems to be trending down to

about 30-32%. Walmart's revenue growth has recently increased to 20%, but the company is larger and more mature than Amazon. A working assumption of a 30% mid-term growth rate is made.

The next step is to forecast Amazon's *cost structure*. For 1999, Amazon had a negative margin (operating and post-tax) of 23% of revenues. To predict future profits we must establish how much of these costs are fixed, semi-fixed and variable. We assume that cost of sales (average 80% of revenues) is purely variable. Below we plot the remaining costs, 'SG&A', against revenue (X-axis). Amazon's cost structure has been extremely 'lumpy' or semi-fixed. The flatter line segments in the quarterly data correspond to the Christmas period, when Amazon's incremental fixed costs per \$ of revenues are lowest. Even so variable cost exceeds 100% of revenues. In last quarter 1998 Amazon.com added \$99m of revenues, while SG&A increased by \$27m (27%). In last quarter 1999 the firm added \$320m of revenues, while SG&A increased by \$101m (31%). Under this scenario Amazon would have no value.

For an optimistic scenario we assume that Amazon can increase gross margin to 25% of revenues. (There is no evidence of this in historical data. In fact quarterly data shows a declining gross margin since third quarter 1998.) We assume that all general and administrative costs, and product development costs, are fixed. Marketing and sales costs include both brand-building costs (arguably fixed) and selling and fulfilment costs (arguably variable). Noting from the 10-K statements required by US regulators that advertising expenditures account for about 50% of marketing and sales costs, we place a ballpark of 75% of the marketing and sales costs being fixed. This is generous and assumes that Amazon's brand is established and that only maintenance advertising (at 50% of 1999 sales and marketing costs) and PR (25%) is needed to maintain sales growth. Thus, total variable costs of Amazon are 81% of revenues under this scenario. Fixed costs are \$540m.

The next forecasting requirement is Amazon's *operating assets*. Amazon's operating assets (excluding acquired assets) were 20% of revenues in 1999. The company also makes extensive use of operating leases. Assuming a cost of capital of 7% for these leases, their present value at December 1998 (December 1999's audited report not having

Figure 2
Amazon's growth

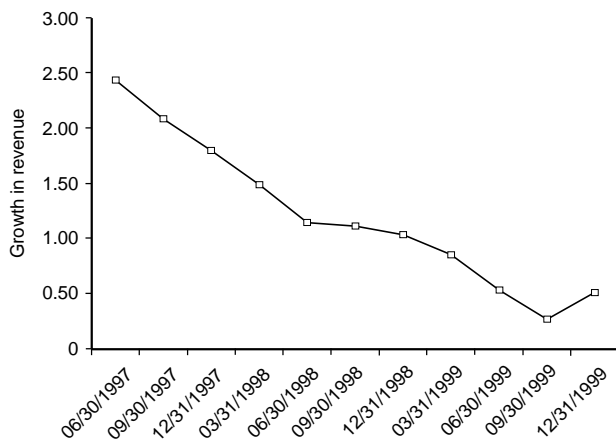
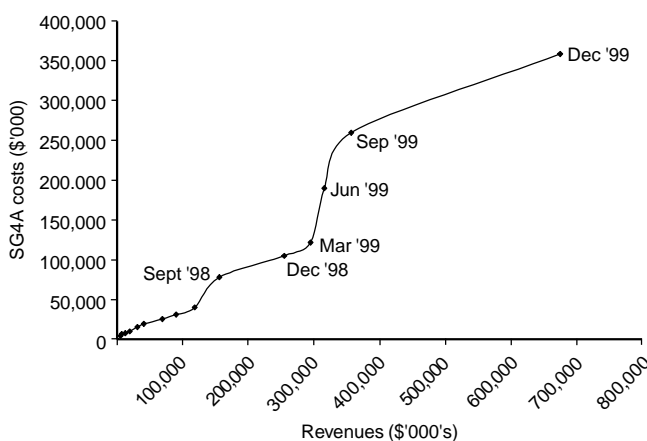


Figure 3
Amazon's "overhead" versus revenues



been published) was approximately \$100m, or an additional 16% of revenues. Acquired assets accounted for an additional 30% of revenues in 1998 and 40% of revenues in 1999. Therefore we have estimates of asset needs of between 20% of revenues and 76% of revenues. We assume that operating assets are 20% of sales.

Amazon.com currently has a (very high) beta of 2.88 (source: www.marketguide.com) which might suggest a cost of capital of about 20% (assuming a 5.5% risk free rate and a 5% risk premium). 15% is used for comparison, since the beta may decrease as the business matures. The final key parameter is the treatment of the terminal value, the value that comes from an assumed steady state period after the explicitly modelled ten years. A terminal PE of 30 times year-ten earnings is used (based on US market PE of about 35). Amazon has \$845m of tax losses which prevent the company from paying tax until year four of the simulation.

Sense-checking revenues and returns

We have simulated the increasing competitive pressures the company will face by the exponential decay of revenue growth. The revenue at year ten, on the above assumptions, is \$30bn. This would require Amazon to dominate one or more of its potential markets. In the optimistic case, the return on operating assets rises to 78% in year ten. Walmart's return on operating assets has varied between 20 and 25% in recent years. Capping Amazon's return at 35%, a level which is still likely to tempt other firms to enter the market and depress prices further, gives the competitive market scenario (labelled "competitive" below). The fixed-cost assumptions in this scenario are as per the optimistic case. As we see below, assuming a competitive market has a devastating effect on valuation.

As noted above, margin assumptions are key. To illustrate this, we define a "reasonable" scenario where gross margin persists at the current level of 20%, rather than rising to 25%. This is similar in effect to a higher than predicted requirement for operating assets or a higher than predicted variable component of costs.

These scenarios produce the following values, compared to a market valuation of \$22bn at the time of going to press.

	<i>Optimistic</i>	<i>Reasonable</i>	<i>Competitive</i>
<i>Cost of capital 20%</i>	\$14.8bn	\$9.5bn	\$7.8bn
<i>Cost of capital 15%</i>	\$23.4bn	\$15.3bn	\$12.1bn

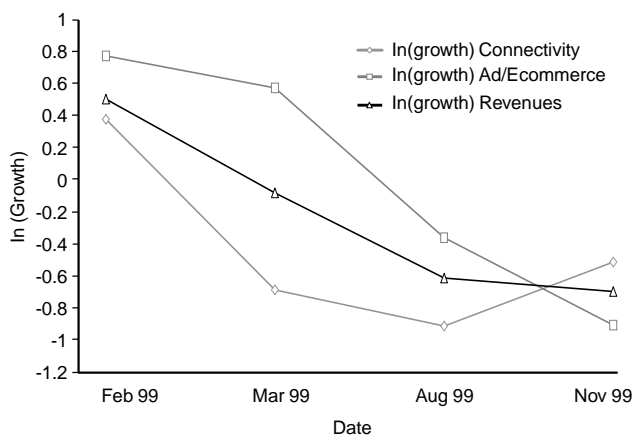
Desmet *et al* model four scenarios to establish a range of achievable values for Amazon, the lowest of which is \$3bn ("Amazon becomes a fair sized retailer...with many competitors") and the highest of which is \$79bn (Amazon becomes the second largest retailer, on- or off-line, in the US and captures much higher operating margins than its competitors). These outcomes are then weighted using necessarily subjective weights to give a value close to Amazon's current price. The most difficult aspect of their analysis is the high operating margins and revenue growths assumed for the scenarios. The most optimistic scenario has an operating margin of 14%. Walmart, the world's most successful retailer, secured operating margins of between 5.4% and 5.8% between 1997 and 1999, while Barnes and Noble's margins varied between 4.9% and 6.3%. UK food retailer Tesco secured operating margins ranging between 5.0% and 5.6% over the same period. Both Tesco and Walmart (as a result of UK planning law and US geography, respectively) have a source of competitive advantage in their ability to dominate local retail markets. All these old-economy firms have lower margins, despite their lower asset turns. Desmet *et al* suggest that Amazon might have an asset turnover of 3.4 in their most optimistic scenario, which implies a return on capital of 48%. Such a return would attract competitors into Amazon's markets. As we noted earlier, the low asset needs of Amazon and other internet businesses are a two-edged sword.

Freereserve

Applying the same framework to Freereserve plc as to Amazon, it quickly becomes apparent that, in examining the small amount of past data, growth seems to be a potential problem. Freereserve's last quarterly growth number (adjusting all periods to 13 week equivalents) was 49%. This is equivalent to a 392% annual growth. However, the log graph of revenue growth suggests Freereserve's revenue growth is declining quite quickly (figure 4).

The most important item is the top line on the chart, which is the logarithm of growth in e-commerce and advertising revenues (source for revenue split: Bubb *et al* 2000). This is because the bottom, and initially

Figure 4
Growth of Freeserve Revenue



slowest-growing, line shows the growth in “interconnect” revenues, the share of the local call fee which Freeserve receives (this is between 10 and 17% according to Société Générale). Most analysts view this revenue as vulnerable to changes in the telecoms market, in particular to the provision of free or fixed fee internet calls by one or more of the telephone operators (at the time of writing several telecoms operators were unveiling initiatives of this type). (The up-tick in the rate of growth of this revenue item in the last quarter was due to a one-off renegotiation of the proportion of the telephone revenue passed to Freeserve.)

The rate of decay in e-commerce revenue growth is 0.55 per quarter. This suggests that growth rates are declining very rapidly for Freeserve. Next year’s revenue growth in this key area would be less than 10% of last year’s if this rate of decay continues, and implies a decay to 19% of previous growth in revenues overall. With generous margin assumptions of 35%, based on Yahoo!’s best quarterly margin (fourth quarter 1999) of 32%, and zero operating assets, this suggests a value of £670m for the company (using a 15% cost of capital) indicating that, while growth may not be sufficient to create value, it is certainly necessary. However, it may be that Freeserve is losing growth momentum temporarily while it builds up its management team. If Freeserve manages to slow the decline in its revenue growth to a decay rate of 50% per annum, trending down to revenue growth of 30% per annum and achieve an operating margin of 50% of sales for 20 years (!), it can justify its early March valuation of £8bn.

6. Conclusions

Since most internet companies are start-up or early-stage businesses, looking at price/revenue or price/earnings multiples is not very revealing. The only way to make sense of these businesses is to attempt to forecast the free cash flow that they will generate.

Predicting the market for these businesses is difficult enough; the range of plausible values for market size and share is very wide indeed. But expectations about the future competitive environment are just as important. Frequently, there seems to be an implicit assumption that this competitive environment will be benign and that companies will earn old-economy margins, or better. On the contrary, we suspect that for most the future will be strenuously competitive. In such a world, the market keeps companies on survival rations, no better.

Applying this logic to Amazon, which has been perhaps the most picked over of the internet stocks, showed just how sensitive its valuation is to expectations about growth, but especially about margin. To thrive in this competitive world, or to do better, companies will need to be lean, nimble and constantly innovative. Some internet businesses will turn out to justify their current valuations and Amazon *may* be one of them. But most will not.

If there is a bubble in internet stock prices, or in technology stocks more generally, does this matter? Stock market capitalisation is now around 150% of US GDP, three times its long-term average, and technology accounts for about a third of that capitalisation. These asset prices have supported booming US consumption, so it is easy to construct a story in which a sharp correction would impact economic growth, and would spill over to economies like the UK and Germany with relatively small technology capitalisations. The consequences may be reduced if the balloon deflates gently, and individual stocks converge on fundamentals in a piecemeal way. Economic managers are busy trying to achieve this, by entreaty and using interest rates.

While the end of a bubble may bring macroeconomic consequences, there are micro effects while a bubble persists. The issue here is the effect of asset mispricing on resource allocation. For example, many commentators argue that the most enduring business model will be “clicks and mortar”, ie leveraging offline

assets (stores and warehouses) with online assets and vice versa. In a bubble, companies which own successful internet operations may be tempted to spin them off to give shareholders the benefit of bubble valuations, at risk of compromising their ability to capture the synergies from a “clicks and mortar” strategy. On the other hand, high observed valuations may tempt corporate managers to build internet activities even though they possess no competency or advantage in this area, and where it may not exploit synergies or competitive advantages of the parent. Thirdly, new economy companies with bubble valuations may use overvalued paper to facilitate acquisitions of businesses which they have little ability to manage.

The central valuation task is to form reasonable expectations about the competitive dynamics of the

industries in which these companies are involved. The “auction economy” heralded by the internet is likely to make the competitive environment less comfortable for firms, both in online and offline markets, with obvious effects on forecast margins. Where companies are overvalued, it is often because commentators who have justified the values of the net companies have made fundamental errors in the issue of sustainability of business models, profitability and asset requirements.

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