Sciteb

Rational Values in the New Economy

Participants included:

Sir Steve Robson CB - Chair
Michael Armitage (MSDW)
Nicholas Beale (Sciteb)
Rodney Coleman (IC)
Sherry Coutu (iii)
Sonia Lo (eZoka.com)
Simon Murdoch (Episode1)
John Richards (SGAM)
Sir Alan Rudge FRS
Jan Schultink (McKinsey)
James Sergeant (Cabinet Office)
Theresa Wallis (AIM)
Gay Wisbey

All participants were involved in their personal capacities and the views in this report do not necessarily represent the views of any firm or organisation.

www.nesd.org.uk

New Economy Sector Dialogue

Contents

Executive Summary

The New Economy Sector Dialogue has met three times and had continued discussion and dialogue over the web. We believe we have reached some useful consensus that is worth sharing with the wider community. Here is a summary of the key points – additional and supporting detail is found in the attached papers.

a) Value in the 'new economy' depends primarily on Intellectual Assets, by which we mean everything the company owns that *isn't* a 'tangible' asset. This is true of many other sectors: where new economy differs is that there is usually very little else to go on. Although improved methods of financial analysis on Intellectual Assets are becoming available, there is no substitute for business judgement based on understanding. Economic theories based on equilibrium and perfect information are of limited value: such conditions are almost never present in 'new economy' situations. This has been highlighted in new economy companies coming to the market at a much earlier stage of their corporate development, posing considerable difficulties for investors in their assessment.

b) One consequence is that the quality of investors in a company is very important, especially pre-IPO. There is a huge difference between the value added from smart, responsible investors and VCs and from the converse. The various stakeholders need to work together to accelerate the shakeout of the naïve and irresponsible. By responsible investors we mean principally those who are willing to be active and supportive and work for continuing success. The paper *VC Issues, Smart Investors and Smart Entrepreneurs* by Sherry Coutu and Sonia Lo is a stimulating exploration of these issues, and of the differences between smart and dumb VCs and Entrepreneurs. Managements need to give careful thought to allotment policies in IPOs to obtain the best investor mix, and not just the best price.

c) At the time of IPO, and subsequently, the limited understanding by the investment community of such companies has tended to result in herd performance and a focus on relative rather than absolute value. This can result in excessive volatility in stockmarket prices: especially when exacerbated by technical factors such as limited floats and a move towards index tracking. Michael Armitage's paper *www.com: what went wrong with dot com* provides valuable insights into these areas, and attempts to draw some lessons for the future: this may not be the last boom/bomb cycle in the New Economy.

d) Traditional discounted cashflow forecasts are not a sufficient method of understanding New Economy value. The paper *Valuing dot coms* in the McKinsey Quarterly (reproduced by permission) shows 'best of breed' application of DCF, but there is evidence, as outlined in the paper *Rigorous on Cashflow, Rigorous on the Causes of Cashflow* by Nicholas Beale, that direct focus on the Intellectual Assets of a business, in addition to the cashflows, leads to a better understanding of value. Another interesting technique is Real Options, although the practical application appears problematic. Work is in hand on how to integrate these approaches and the strengths and weaknesses of each, a separate report will be issued, with examples, by the end of December. Improved models could help investors and management focus more transparently on what has to be delivered to justify a particular market value.

e) Most New Economy businesses are highly mobile, and largely unconstrained by geography. Success in the New Economy depends on *global* excellence in people, infrastructure and the financial, legal and regulatory environment. Governments and regulators need to recognise these facts and formulate policies accordingly.

The main suggestions for government and regulators that arise from our work are listed below:

1. **Market 'Depth' needs to be increased in UK and continental European Markets** – These stockmarkets are somewhat less sophisticated with respect to technology investing than their US equivalent; the analytical base is still relatively inexperienced. Deeper understanding is especially important in early stage companies.

2. **Analysts and investors need to become more sophisticated in their approach to valuation:** EBITDA or revenue multiples simply do not cut it given the increasing variety of business model. Instead, variations on and developments of the standard DCF approach - including the use of multiple scenarios such as in the Monte Carlo method, or the use of Intellectual Assets or Real Options as a supplement to the core DCF model - need to be incorporated, whatever the difficulty associated with such an approach. A follow-up note on this, with examples, is planned for December 2000.

3. **The re-weighting of indices to reflect available stock appropriately is highly desirable.** This is done or under way in most cases.

4. **Encourage an equity culture which celebrates success in creating and growing businesses and lessens the stigma associated with failure.** This programme could provide examples of successful people and encourage mentoring and knowledge sharing, and could help overcome shortage of management education and 'role models'.

5. **Ongoing comparison with other tax and regulatory regimes is required.** For example, several New Economy companies have expressed concern in this context about NICs on share options. New Economy businesses are likely to migrate away from those regulatory regimes which tax these significantly more harshly than others.

6. **Publish case studies and examples of 'best practice' for entrepreneurs.** Celebrate the success of these people. Publish case studies written by entrepreneurs for entrepreneurs that can be used as management education. This can help the relative lack of business education in the UK.

7. **Help support (provide) an electronic community of entrepreneurs** so that the lessons learned by the more experienced can be more easily accessed by those less experienced / educated. Ensure that experienced entrepreneurs (those seen as successful as opposed to just retired) agree to contribute / moderate this community.

8. **We welcome the encouragement of economics** on the national curriculum right down to primary school level.

9. **Increase incentives that encourage commercialisation by, with and from universities.** Identify means of increasing the flow of knowledge from universities into UK businesses, recognising that *global* excellence in universities must be encouraged.

10. **Improve access to financial advice / Corporate Governance advice.**

11. **Support and publicise guidelines**, such as the McKinsey e-performance scorecard and the Bain e25 list, which help investors with performance measurement of New Economy companies above and beyond conventional auditing guidelines.

VC Issues, Smart Investors and Smart Entrepreneurs

Sherry Coutu (iii.co.uk) and Sonia Lo (ezoka.com)

Background

What are the key issues where better dialogue / understanding would be helpful in order to ensure that the New Economy is better able to deliver the value that should be achievable in the networked economy?

If there is tremendous value that can be unlocked by the new technologies, how is this best done and what can the stakeholders (entrepreneurs, investors and the government) do to ensure that the expectations of their shareholders are met?

How do the various stakeholders in this situation work together to accelerate the shakeout of the naïve and unethical? Who should be involved and what should they do?

1. Investors

The 'investors' are comprised of venture capitalists, investment banks, private investors and 'the public'. They want a reward for their investment that is comparable to the risk of the investment. They can destroy value as easily as they can create it.

1a What do good VC's and smart investors do to unlock value?

i. Keiretsu - linking the bits of their portfolio together so that the individual parts can help form a supportive community for their portfolio companies. The most successful VC's identify and organise conferences of CEO's, technical staff, product marketers etc. They also actively introduce and encourage their portfolio companies to work together. These provide a forum for linking the busy professionals together so that they share best practice and deal structures. This is management education and helps the executives execute the strategy faster.

ii. Hire sets of advisors / consultants who they can 'insert' into the companies they invest in if the company requires it. Do not ask the entrepreneurs to pay for these, if they add value, then the VC will get their money back in spades. Older VC's do not see this and attempt to 'extract value' from their investee companies at each opportunity. This destroys the relationship that they should be seeking to develop. It may have been 'appropriate' in the day of the LBO, but it is not in the networked economy. Taking of "management fees" also "claws back" either equity or much-needed cash from network economy companies and further exacerbates a management vs. VC divide.

iii. Provide actual executives to prop up the management inexperience in any given area in a company. This helps the growing companies overcome, if only on an interim basis a gap in knowledge which otherwise might cripple the company.

iv. Provide Non-Executive Directors who can work with the CEO in a mentoring / trouble shooting manner to help them deal with whatever situations arise. It is essential that the NED's are experienced past CEO's / serial entrepreneurs rather than 'investment bankers' or 'consultants'. The types of problems the entrepreneurs are facing are not theoretical and they must identify with and respect their NEDs. It is difficult to identify with or learn something from someone who has not gone through what you are going through or who does not have the same tolerance to risk. Also, the issues entrepreneurs' face are not theoretical and an experienced entrepreneur would have faced them themselves at some point, if they have experienced any degree of success. These NED's must provide real support; New Economy companies require active participants. If the NED's expect to only show up for a monthly board meeting, then they will fail to satisfy their fiduciary duty

because they will not understand what is going on in the business. Individual NED's should be restricted to holding no more than 6 board seats at any one time. If they try to hold more then they will not have the time to think about the companies issues or help resolve them.

1b How does this help them achieve what they want?

If the VCs and investors provide active support such as is described below, then the business they are supporting has a greater chance of surviving and thriving. If they are 'passive' or not actively supportive to the businesses and the managers of the business, then the company is more likely to collapse due to the strains of the very fast growth that is typical of how fast these companies can grow.

It is not easy supporting a business growing 60-80 times faster than traditional non New Economy businesses and the investors who expect the returns that can be generated from them must be prepared to add a bit more value than they would for a company that they do not expect as great a return from. The adage 'you get back what you put into it' is probably correct here.

1c What do bad VC's and 'dumb investors' do to destroy value ?

i. Invest in companies that are competitive to other companies in which they invest. This is a 'hallmark' of the large corporate strategic investors and has had deleterious effects on the businesses. Entrepreneurs, when choosing to accept the money of the 'strategic' investor should ensure that clauses in the new shareholders agreement prevent their investor from investing in all their competitors.

ii. Provide NED's to the company who have no experience running companies (only to provide Corporate Governance.)

iii. Insist on board seats and then not add value or supply such a busy exec to the board that they hardly even prepare for board meetings. This slows down the ability of the small company to act swiftly to the changes in the industry. The entrepreneur can limit this by knowing exactly who will sit on their board and ensuring that they can obtain a substitute from the VC / investor in the event that they are not obtaining value from the individual placed on their board. Like all chairmen, the board is a team and the entrepreneur must know that it is their responsibility to make sure that all team members add value.

iv. Don't think about future valuation hurdles that the company will have to meet and are overly greedy in the early rounds. VCs that seek to obtain 80% plus of a company's equity in the 1st round will find it unlikely that anyone will want to follow them in a subsequent round.

1d How can we make sure investors unlock rather than destroy value?

Ensuring that investors do not 'lose his or her shirts' and that the economy does not support a 'bubble that bursts' is everyone's responsibility. Each of the stakeholders bears this cross and must act so as to ensure that confidence in these sorts of companies is not shaken or damaged.

Establish a public acknowledgement forum of those VCs and entrepreneurs who have successfully managed New Economy ventures. There are several initiatives already underway - including NetImperative and the FT Venture Capital Survey.

But who can do the most? Investors? Entrepreneurs or the Government? Whilst investors should have the sense to act in their own self-interest, they do not always do so, as has been seen. When things go wrong they usually cry to the media and the government and say 'do something'.

We think that the investors can do a lot to ensure that they are protected and this starts with actually understanding the fundamentals of any business they are investing in. Entrepreneurs and business people have a real and very active role to play and the burden rests with them mostly. They have the most to gain personally from taking responsibility for the success of their business. Additionally, however, the government has an educational and support (not regulatory) role to play which can make things much better than they have been previously.

The government could help by publishing or encouraging the industry to publish guidelines of 'best practice' for investors, but the most effective method might be to educate the entrepreneurs as to what they have to lose in the event that they 'choose' or 'allow' a naïve or 'bad' investor to invest in their business.

2. Entrepreneurs

It has been suggested that the ultimate responsibility of ensuring investors unlock value rather than destroy value rests with the entrepreneurs. It is not something that can be regulated. What then should the responsible entrepreneur do?

2a. What smart entrepreneurs do to unlock value

- Educate themselves.
- Form communities with other entrepreneurs (in non competing companies) so that they can learn.
- Actively seek out mentors.
- Hire advisors who have the skills sets they need, not just those who volunteer.
- Share information - ideas are not protectable and only grow stronger when subject to market critique.
- Ensure that NED's are not too busy and that they do not hold more than 6 board seats. The entrepreneur may wish to call on them to help out on an active interim basis if necessary.

2b How does this help them achieve what they want?

- Running a business is very much a team sport and the entrepreneur will require skills they do not have in order to succeed.

2c What is done that destroys value?

- Not hiring management / employees who are experienced in the jobs / tasks that need to be done.
- Not stepping back once the business is up and running.
- Choosing inexperienced (but v. enthusiastic) advisors, investors or employees.

2d What can be done by entrepreneurs to ensure that they end up satisfying their shareholders and stakeholders?

- Corporate Governance.
- Refuse passive investors who do not understand the fundamentals of your business. They may have money, but they can be very dangerous.
- Ensure that their investors do have the experience they require.
- Tell all other entrepreneurs if they have run into a 'bad investor' / VC / incubator. Don't let others repeat your mistakes!
- Help other entrepreneurs if they ask. What takes you 5 minutes to figure out may take the person who asks a week and you never know when you might need a friend / favour.
- Communicate. Beyond the formal Board reporting process, agree a communications system (monthly, biweekly, as needed) to talk to your multiple "constituents" - employees, management, shareholders. Don't EVER surprise your shareholders.

3 Can the Government help?

Whether or not there is a role is a matter of great debate. As loud as the larger players scream that there should be no intervention, the smaller players are asking for it. The rule of thumb is that the large incumbents very much prefer the government not to intervene whilst the smaller players would very much prefer the government to do so. They both claim that intervention / non-intervention is critical for the survival of the industry.

There appears to be some consensus amongst entrepreneurs that the best course of action for the Government, if there is one, is for it NOT to regulate, but to understand what the problems were and to facilitate the solution of these problems. To regulate takes too long and this field is moving too fast; it often causes problems rather than removes them.

In the event that past regulation has caused problems, then these should be removed. Well-known bug-bears of the industry being:

- Capital gains tax relief.
- Get rid of NI on stock options.
- Relax the regulation on bankruptcy etc. so that the entrepreneurs will not be so severely penalised for failure.

To educate and catalyse amelioration of the situation is the best course of action.

A bullet point laundry list for the Government to do might include such things as:

- Programme (such as insight) to encourage an equity culture which celebrates success and lessens the stigma associated with failure. This programme could provide examples of successful people and encourage mentoring and knowledge sharing. Could help overcome shortage of management education and 'role models'.
- Publish case studies and examples of 'best practice' for entrepreneurs. Celebrate the success of these people.
- Publish case studies written by entrepreneurs for entrepreneurs that can be used as management education. This can help the relative lack of business education in the UK.
- Help support (provide) an electronic community of entrepreneurs so that the lessons learned by the more experienced can be more easily accessed by those less experienced / educated. Ensure that experienced entrepreneurs (those seen as successful as opposed to just retired) agree to contribute to / moderate this community.
- Encourage economics on the national curriculum right down to the primary school level.
- Increase incentives that encourage commercialisation by, with and from universities. Identify means of increasing the flow of knowledge from universities into UK businesses, recognising that global excellence in universities must be encouraged.
- Improve access to financial advice / Corporate Governance advice.
- Support and publicise guidelines, such as the McKinsey e-performance scorecard or the Bain e25 list, which help investors with performance measurement of new economy companies above and beyond conventional auditing guidelines.
- Encourage deeper penetration of securities ownership in the general population through education about different financial instruments from an early age.

Stock Market Excesses: www.com: what went wrong with dot com

Michael Armitage (Morgan Stanley Dean Witter)

There were multiple factors that explain the apparently erratic gyrations of the stockmarket over the last year - beyond the obvious explanation of a shifting balance between greed and fear.

Why it went up

1. A New Economic Paradigm - The 'bubble' period of Q4/99-Q1/00 followed nine years of US economic expansion and rising stock prices.

This extended benign environment has been attributed to various factors, including the end of the Cold War, the reallocation of development spending from military to commercial ends, and to the contribution of technology to a more 'frictionless' capitalism, thereby raising the sustainable, low inflation growth potential of the economy. This supposed economic nirvana, accompanied by cyclically low interest rates, supported unprecedented valuation levels across the stockmarket - in both 'old' and 'new' economy sectors. This has been exhaustively documented.

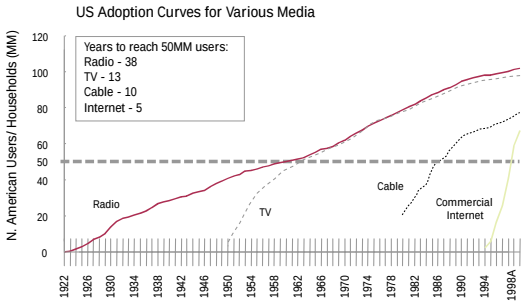
Exhibit 1
US GDP Growth and Stock Market Performance

Source: Morgan Stanley Dean Witter

2. Telecommunication deregulation - the 1996 Telecommunications Act in the US and the 1/98 liberalisation deadline in Europe heralded a period of intense corporate restructuring and entrepreneurial activity in the telecommunications sector in the late 1990s. This in turn precipitated an unprecedented demand for venture capital and ultimately public market funding (both high yield and equity) for new telecommunications ventures during 1998-1999.

3. "The Internet changes everything" - Technological developments in telecommunications accelerated in the mid-late 1990s as the newly deregulated industry began to catch up with the 'silicon revolution' of the computer industry. This culminated in the emergence and subsequent rapid proliferation of the Internet Protocol and the World Wide Web, and the emergence and subsequent rapid proliferation of radical new economic models.

Exhibit 2
Internet Take-up



Source: MSDW Research

4. Liquidity - The 'Equification of Europe' has been an extremely powerful driver of equity market valuations in the last few years, as pension reform throughout Europe, the secular shift out of Government securities, as well as rising stock prices have attracted unprecedented flows of private and institutional money into equity markets.

5. Europe starved of growth companies - Given Europe's, and particularly European stockmarkets', relatively heavier dependence on 'old' economy sectors and the relatively undeveloped technology sector, it is

inevitable that telecoms in general, and 'dot com' in particular, should have become such a focus of interest among investors looking to play secular, rather than cyclical, growth stories. Exhibit 4 shows that the European Tech sector is substantially smaller in market capitalisation terms than the comparable US sector, and that European Telecoms at least partly compensates.

4xhibit 8 Exhibit 3 ogsonsates. 33
Funds Flows

The problem is further exacerbated by the concentration of technology market capitalisation in a small number of large companies - Nokia, Ericsson, Alcatel and Philips.
Many country-oriented fund managers are limited tnahe wTJ.02Toc17.come li near automapic demenerf UShilips.ogson namompesates.

2. Interest rates - The US Fed had been raising short term rates since mid-1999 in a much-applauded attempt to slow the pace of economic expansion; however, economic data published in March and April of this year pointed to an accelerating, not a slowing, US economy, and raised investors' concerns even more about the risk of a hard landing for the economy.

3. Specific catalysts - A number of industry events served as individual triggers for a re-examination of fundamentals, notably the World Online IPO, and the Microsoft anti-trust ruling.

4. Liquidity slowed - After an extraordinary rush of private money into equity funds at the end of 1999, there was a marked slowdown in March (Exhibit 3). This fact, and the fear that wilting share prices would fuel a vicious circle of redemptions, proved to have the power of a self-fulfilling prophecy.

5. Pipelines - Rising share prices fueled a substantial pipeline of prospective equity issuance - follow-on sales by Governments of their partially privatised telcos, plus initial offerings of new companies. The subsequent rising cost of radio spectrum for 3G services has expanded this backlog even further, to the extent that fully three quarters of the estimated €80 billion European equity pipeline is accounted for by wireless companies.

6. Challenging fundamentals - The first quarter of 2000 presented ample anecdotal evidence that some of the more extreme, if not blind, optimism of the preceding few months had been misplaced:

i. Amazon.com's Q4 and Q1 earnings statements highlighted to many the precariousness of many B2C dot com models.

ii. The Microsoft anti-trust ruling.

iii. Regulatory concerns: the proposed tax on on-line retail sales; regulatory objections to the WCOM/Sprint merger; etc.

iv. Continual pressure on voice telephony margins, notably in US and European switched long distance; and, perhaps the final straw...

v. The UK's 3G Licence auction, massively raising the industry's cost base, and seriously raising the spectre of 'profitless prosperity'.

The Result

Reality invaded the New Paradigm dream. High yield bond spreads rose by anything up to 500 basis points within a month; share prices of the more highly leveraged and / or lower visibility new entrants fell by as much as two-thirds in the space of a month, and TMT stocks generally fell around 40%-50%; valuations generally returned to their mid-1999 levels; numerous proposed IPOs were re-priced and downsized, with most subsequently trading below issue price; many more were postponed, at least until September; 'old economy' stocks/sectors rallied.

The Lessons?

As we see it, there are numerous lessons to be learned from the last six months.

1. **It's not unusual** - Stockmarkets have had their booms and busts before - this one was not particularly exceptional.

2. **Industry fundamentals** are still very largely intact; demand for IP-based services is still exploding, and with it the requirement for capacity and connectivity; interest rates are no longer rising. Investors have been returning, albeit nervously, and valuations have partially recovered - KPNQwest and Versatel, for example, have both doubled since the market trough at the end of May.

Valuing dot coms

Driek Desmet, Tracy Francis, Alice Hu, Timothy M. Koller, and George A. Riedel

Reprinted by kind permission from the McKinsey Quarterly Spring 2000.
The authors thank Pat Anslinger, Ennius Bergsma, Michael Drexler, and Jan Schultink for their contributions to the methods described in this article.

You don't have to step through the looking glass into a parallel universe to understand the valuations of Internet stocks. Discounted-cash-flow analysis can focus your mind on the right issues, help you see the risks, and separate the winners from the losers.

In the present era of cheap and accessible capital, Internet entrepreneurs have succeeded in quickly transforming their business ideas into billion-dollar valuations that seem to defy the common wisdom about profits, multiples, and the short-term focus of capital markets. Valuing these high-growth, high-uncertainty, high-loss firms has been a challenge, to say the least; some practitioners have even described it as a hopeless one.

In this article, we respond to that challenge by using a classic discounted-cash-flow (DCF) approach to valuation, buttressed by microeconomic analysis and probability-weighted scenarios. Although DCF may sound suspiciously retro, we believe that it works where other methods fail, reinforcing the continuing relevance of basic economics and finance, even in uncharted Internet territory.[1] Yet it is important to bear in mind that while the valuation techniques we sketch out can help bound and quantify uncertainty, they won't make it disappear. Internet stocks are highly volatile for sound and logical reasons, and they will remain highly volatile.

DCF analysis when there is no CF to D

Three related factors make it hard to value Internet companies. First, like many start-ups, they typically have losses or very small profits for a few years, partly because of the high marketing costs (aimed at attracting customers) that they must write off against current earnings. Second, these companies are growing at very high rates: successful ones will increase their revenues by 100 times or more in the early going. Finally, the fate of these companies is quite uncertain.

Shorthand valuation approaches, including price-to-earnings and revenue multiples, are meaningless when there are no earnings and revenues are growing astronomically. Some analysts have suggested benchmarks such as multiples of customers or multiples of revenues three years out. These approaches are fundamentally flawed: speculating about a future that is only three or even five years away just isn't very useful when high growth will continue for an additional ten years. More important, these shorthand methods can't account for the uniqueness of each company.

The best way of valuing Internet companies is to return to economic fundamentals with the DCF approach, which makes the distinction between expensed and capitalized investment, for example, unimportant because accounting treatments don't affect cash flows. The absence of meaningful historical data and positive earnings to serve as the basis for price-to-earnings multiples also doesn't matter, because the DCF approach, by relying solely on forecasts of performance, can easily capture the worth of value-creating businesses that lose money for their first few years. The DCF approach can't eliminate the need to make difficult forecasts, but it does address the problems of ultrahigh growth rates and uncertainty in a coherent way.

In this discussion, we assume that the reader has a basic knowledge of the DCF approach. Three twists are required to make this approach more useful for valuing Internet companies: starting from a fixed point in the future and working back to the present, using probability-weighted scenarios to address high uncertainty in an explicit way, and exploiting classic analytical techniques to understand the underlying economics of these companies and to forecast their future performance.

We illustrate this approach with a valuation of Amazon.com, the archetypal Internet company. In the four years since its launch, it has built a customer base of

[1]For a complete discussion of the DCF approach, see Tom Copeland, Timothy M. Koller, and Jack Murrin, *Valuation: Measuring and Managing the Value of Companies*, second edition, New York: John Wiley & Sons, 1995. Chapter 3, "Cash Is King," may be of particular interest.

ten million and expanded its offerings from books to compact discs, videos, digital video discs, toys, consumer electronics goods, and auctions. In addition, Amazon has invested in branded Internet players such as pets.com and drugstore.com, and since the end of September 1999 it has allowed other retailers to sell their wares on its Website through what it calls its "associates program." Indeed, the company has become a symbol of the new economy; market research shows that 101 million people in the United States recognize the Amazon brand name.

All this activity has been rewarded with a high market capitalization: $25 billion as of mid-November 1999. Yet Amazon has never turned a profit and is expected to lose at least $300 million for the year, so it has become the focus of a debate about whether Internet stocks are greatly overvalued.

Start from the future

In forecasting the performance of high-growth companies like Amazon, don't be constrained by current performance. Instead of starting from the present—the usual practice in DCF valuations—start by thinking about what the industry and the company could look like when they evolve from today's very high-growth, unstable condition to a sustainable, moderate-growth state in the future; and then extrapolate back to current performance. The future growth state should be defined by metrics such as the ultimate penetration rate, average revenue per customer, and sustainable gross margins. Just as important as the characteristics of the industry and company in this future state is the point when it actually begins. Since Internet-related companies are new, more stable economics probably lie at least 10 to 15 years in the future.

But consider what Amazon has already achieved. Its ability to enter and dominate categories is unprecedented, both in the off- and the on-line worlds. In 1998, for example, it took the company only a bit more than three months to banish CDNOW to second place among on-line purveyors of music. In early 1999, Amazon assumed the leadership among on-line purveyors of videos in 45 days; recently, it became the leading on-line consumer electronics purveyor in 10.

Let us create a fairly optimistic scenario based on this record. Suppose that Amazon were the next Wal-Mart, another US retailer that has radically changed its industry and taken a significant share of sales in its target markets. Say that by 2010, Amazon continues to be the leading on-line retailer and has established itself as the overall leading retailer, both on- and off-line, in certain markets. If the company could take a 13 and 12 percent share of the total US book and music markets, respectively, and captured a roughly comparable share of some other markets, it would have revenues of $60 billion in 2010, when Wal-Mart's revenues will probably have exceeded $300 billion.

What operating profit margin could Amazon.com earn on that $60 billion? The superior market share of the company is likely to give it significant purchasing power. Remember too that Amazon will earn revenues and incur few associated costs from other retailers using its site. In this optimistic scenario, Amazon, with an average operating margin in the area of 11 percent, would most likely do a bit better than most other retailers.

And what about capital? In the optimistic scenario, Amazon may well need less working capital and fewer fixed assets than traditional retailers do. In almost any scenario, it should need less inventory because it can consolidate its stock-in-trade in a few warehouses, and it won't need retail stores at all. We assume that Amazon's 2010 capital turnover (revenues divided by the sum of working capital and fixed assets) will be 3.4, compared with 2.5 for typical retailers.

Combining these assumptions gives us the following financial forecast for 2010: revenues, $60 billion; operating profit, $7 billion; total capital, $18 billion.

We also assume that Amazon will continue to grow by about 12 percent a year for the next 15 years after 2010 and that its growth will decline to 5.5 percent a year in perpetuity after 2025, slightly exceeding the nominal growth rate of the gross domestic product.[2] To estimate Amazon's current value, we discount the projected free cash flows back to the present. Their present value, including the estimated value of cash flows beyond 2025, is $37 billion.

How can we credibly forecast ten or more years of cash flows for a company like Amazon? We can't. But our goal is not to define precisely what *will* happen but instead to offer a rigorous description of what *could*.

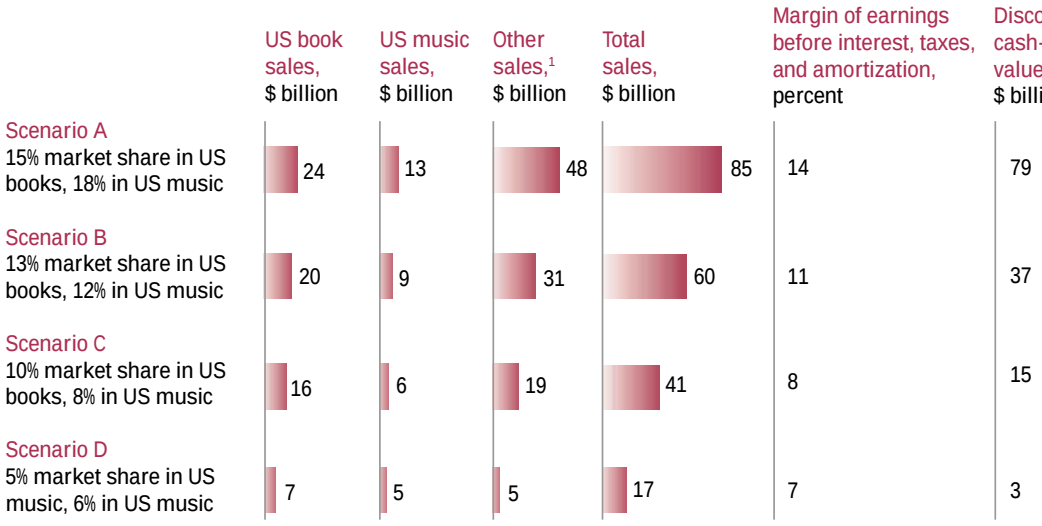
Weighting for probability

Uncertainty is the hardest part of valuing high-growth technology companies, and the use of probability-weighted scenarios is a simple and straightforward way to deal with it. This approach also has the advantage of making critical assumptions and interactions far more transparent than do other modeling approaches, such as Monte Carlo simulation. The use of probability-weighted scenarios requires us to repeat the process of estimating a future set of financials for a full range of scenarios—some more optimistic, some less. For Amazon, we have developed four of them (Exhibit 1).

In Scenario A, Amazon becomes the second-largest retailer (on- or off-line) based in the United States. It uses much less capital than traditional retailers do because it is primarily an on-line operation. It captures much higher operating margins because it is the on-line retailer of choice; even if its prices are comparable to those of other on-line retailers, it has more purchasing clout and lower operating costs. This scenario implies that Amazon was worth $79 billion in the fourth quarter of 1999.

Scenario B has Amazon capturing revenues almost as large as it does in Scenario A, but its margins and need for capital fall in the range between those of the first scenario and the margins and capital requirements of a traditional retailer. This second scenario implies that Amazon had a value of $37 billion as of the fourth quarter of 1999.

Exhibit 1
Amazon.com: Potential outcomes



[1] Books and music sold outside the United States as well as sales of video, digital video discs, toys, and consumer electronic goods in any market.

[2] Real GDP growth has averaged about 3 percent a year for the past 40 years, and the long-term expected inflation rate built into current interest levels is probably about 2 to 2.5 percent a year.

Amazon becomes quite a large retailer in Scenario C, though not as large as it does in Scenario B, and the company's economics are closer to those of traditional retailers. This third scenario implies a value for Amazon of $15 billion.

Finally, in Scenario D, Amazon becomes a fair-sized retailer with traditional retailer economics. On-line retailing mimics most other forms of the business, with many competitors in each field. Competition transfers most of the value of going on-line to consumers. This scenario implies that Amazon was worth only $3 billion.

We now have four scenarios, in which the company's value ranges from$3 billion to $79 billion. Although the spread is quite large, each scenario is plausible.[3] Now comes the critical phase of assigning probabilities and generating the resulting values for Amazon (Exhibit 2). We assign a low probability, 5 percent, to Scenario A, for though the company might achieve outrageously high returns, competition is likely to prevent this. Amazon's current lead over its competitors suggests that Scenario D too is improbable. Scenarios B and C—both assuming attractive growth rates and reasonable returns—are therefore the most likely ones.

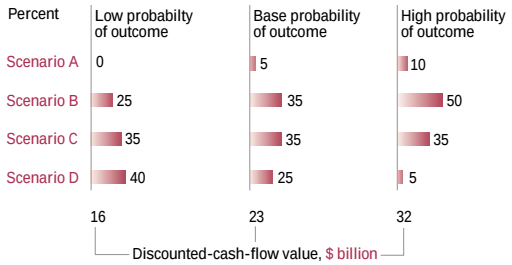
Exhibit 2
Amazon.com: Expected value

	Discounted-cash-flow value, $ billion	Probability, percent	Expected value, $ billion
Scenario A	79	5	3.9
Scenario B	37	35	13.0
Scenario C	15	35	5.3
Scenario D	3	25	0.8
			$23.0 billion

When we weight the value of each scenario, depending on its probability, and add all four of these values, we end up with $23 billion, which happened to be the company's market value on October 31, 1999. It therefore appears that Amazon's market valuation can be supported by plausible forecasts and probabilities.

Now, however, look at the sensitivity of this valuation to changing probabilities. As Exhibit 3 shows, relatively small variations lead to big swings in value. Indeed, the volatility of the share prices of companies like Amazon has been precipitated by small changes in the market's view of the likelihood of different outcomes. Nothing can be done about this volatility.

Exhibit 3
Amazon.com: Volatility of expected values



From probability to reality

The last difficult aspect of valuing very high-growth companies is relating future scenarios to current performance. How can you tell a soon-to-be-successful Internet play from a soon-to-be-bankrupt one? Here, classic microeconomic and strategic skills play a critical role because building sound scenarios for a business and understanding that business both require knowledge of what actually drives the creation of value. For Amazon and many other Internet companies, customer-value analysis is a useful approach. Five factors drive the customer-value analysis of a retailer like Amazon:

- The average revenue per customer per year from purchases by its customers, as well as revenues from advertisements on its site and from retailers that rent space on it to sell their own products
- The total number of customers
- The contribution margin per customer (before the cost of acquiring customers)
- The average cost of acquiring a customer

[3]We capture cash-flow risk through the probability-weighting of scenarios, so the cost of equity applied to each of them shouldn't include any extra premium; it can consist of the risk-free rate, an industry-average beta, and a general market-risk premium.

- The customer churn rate (that is, the proportion of customers lost each year)

Let us see how Amazon could achieve the financial performance predicted by Scenario B and compare this with the company's current performance. As Exhibit 4 shows, the biggest changes over the next ten years involve the number of Amazon's customers and the average revenue for each. In Scenario B, Amazon's customer base increases from 9 million a year in 1999 to about 120 million worldwide by 2010-84 million in the United States and 36 million outside it. We assume that Amazon will remain the number-one US on-line retailer and achieve an attractive position abroad.

Exhibit 4
Amazon.com: Customer economics, Scenario B

	1999	2010
Average revenue per customer, $	140	500
Customers, million	9	120
Contribution margin, percent	14	14
Acquisition cost per customer, $	29	50
Customer churn rate, percent	25	25

Scenario B also calls for Amazon's average revenue per customer to rise to $500 by 2010, from $140 in 1999. That $500 could be accounted for by two CDs at $15 each, three books at $20 each, two bottles of perfume at $30 each, and one personal organizer at $350. Amazon will probably continue to dominate its core book and music markets. It will probably enter adjacent categories and may come to dominate them.

In Scenario B, Amazon's 2010 contribution margin per customer before the cost of acquiring customers is 14 percent, a figure in line with that of current top-notch large-scale retailers—Wal-Mart, for instance. Despite competition, this seems rational in view of Amazon's likely ability to gain offsetting economies of scale through devices such as renting other retailers space to market their products on Amazon's Websites.

Scenario B predicts that Amazon will have acquisition costs per customer of $50 in 2010. Despite the argument that these costs will rise once all on-line customers have been claimed, this is a reasonable figure if the company can achieve brand dominance and advertising economies of scale. The cost of acquiring new customers is closely linked to the customer churn rate, which at 25 percent suggests that once Amazon acquires customers it will keep them four years. This implies a truly world-class (or addictive) customer offer and a deeply loyal (or lazy) customer base.

Looking at customer economics in this way makes it possible to generate the kind of information that is needed to assess the probabilities assigned to various scenarios. Consider how two hypothetical young companies, Loyalty.com and Turnover.com, with different customer economics might evolve over time (Exhibit 5). Each had $100 million in revenues in 1999 and an operating loss of $3 million. On traditional financial statements, the two companies look very much the same. Deeper analysis, however, using the customer economics model, reveals striking differences.

Exhibit 5
Customer economics: An example

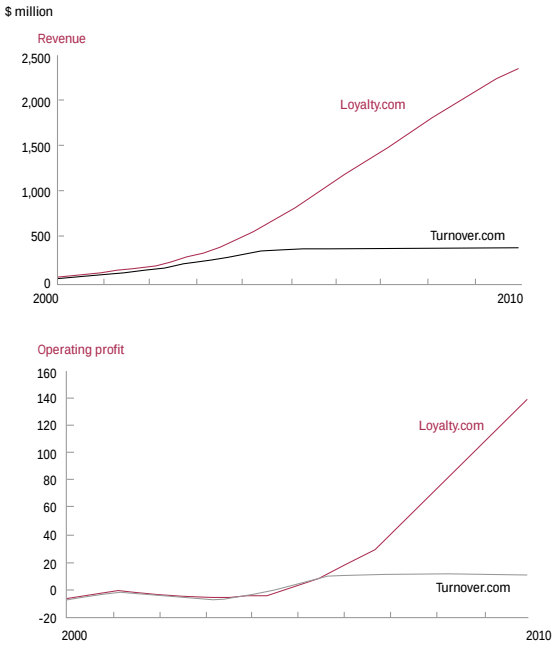
	Loyalty.com	Turnover.com[1]
Average revenue per customer, $	250	342
Contribution margin, percent	15	15
Acquisition cost per customer, $	75	93
Customer churn rate, percent	20	46

[1] Assumes discount rate of 12% in Year 2.

The lifetime value of a typical Loyalty.com customer is $50 over an average of five years; the typical Turnover.com customer is worth—$1 over two years. The difference in the value of a customer reflects the churn rate (20 percent attrition each year for Loyalty.com versus 46 percent for Turnover.com) and Turnover.com's higher acquisition costs.

Even though Turnover.com earns higher revenues per customer than Loyalty.com does and has similar contribution margins, its economic model is not sustainable. Loyalty.com will find it much easier to grow because it doesn't have to find as many new customers each year. Since Loyalty.com will have substantially lower customer acquisition costs than Turnover.com, Loyalty.com's figures for earnings before income tax (EBIT) will turn positive more quickly. If Loyalty.com and Turnover.com invested the same amount of money in efforts to acquire customers over the next ten years, and other factors remained the same, the revenue growth and EBIT patterns of the two companies would vary a good deal (Exhibit 6). This in turn means that their DCF values would differ radically, despite similar short-term financial results.

Exhibit 6
Long-term performance: An example



Uncertainty is here to stay

By using the adapted DCF approach outlined here, we can generate reasonable valuations for seemingly unreasonable businesses. But investors and companies entering fast-growth markets like those related to the Internet face huge uncertainties. Look at what could happen under our four scenarios to an investor who holds a share of Amazon stock for ten years after buying it in 1999.

If Scenario A plays out, the investor will earn a 23 percent annual return, and it will seem that in 1999 the market significantly undervalued Amazon. If Scenario C plays out, the investor will earn about 7 percent a year, and it will seem that the company was substantially overvalued in 1999. These high or low returns should not, however, be interpreted as implying that its 1999 share price was irrational; they reflect uncertainty about the future.

A great deal of this uncertainty is associated with the problem of identifying the winner in a large competitive field: in the world of high-tech initial public offerings, not every Internet company can become the next Microsoft or Cisco Systems. History shows that a small number of players will win big while the vast majority will toil away amid obscurity and worthless options, and it is hard to predict which companies will prosper and which will not.[4] Neither investors nor companies can do anything about this uncertainty, and that is why investors are always told to diversify their portfolios—and why companies don't pay cash when acquiring Internet firms.

[4]Morgan Stanley research on 1,243 technology initial public offerings has shown that more than 86 percent of the value created in them during the past decade came from only 5 percent of the companies.

Rigorous on Cashflow, Rigorous on the Causes of Cashflow

Nicholas Beale (Sciteb)

1. Background

1.1 The McKinsey Quarterly paper gives a very useful overview of the way in which traditional DCF techniques can be applied to valuing dot coms. Unfortunately the actual worksheets which were used in the article are not available, but I have reconstructed valuations which give similar results. These enable us to appreciate better some of the issues as they apply to a company like Amazon. We can then look at ways in which these issues can be addressed.

2. Issues

2.1 The first significant problem with a DCF valuation of the type advocated in the paper is that almost all the value of the business is in the far future. According to the worksheet that reconstructs these valuations (on the www.nesd.org.uk website), under Scenarios A to D the % of the NPV accounted for by the years 2016 onwards varies from 93% (A) to 143% (D), and the value post 2025 varies from 69% to 116%. Given the remarkable changes in the 'New Economy' it is a brave person who wagers billions on predictions about the years 2016 onwards.

2.2 A second related issue is that the 'value drivers' are highly imponderable and somewhat disconnected from plausible real value drivers. For example a 10% uncertainty in the Capital Requirements changes the valuation by 4-19% (D) and a 10% uncertainty in the mid-period growth rate (ie from 12% to 13.2%) changes the value by between 14-16%.

2.3 Perhaps a more fundamental problem is that the modelling approach makes no distinction between the investments that companies like Amazon make in Intellectual Assets and sheer operating costs. Whereas it is true in a sense that these are all ways of using cashflow, and eventually the results come through, there is a fundamental logical distinction between investments, whether in Intellectual or Tangible Assets, that is worth retaining in order to deepen our understanding of the Causes of Cashflow.

3. Looking Inside the Black Box

3.1 We believe that what is needed is a systematic approach to understanding the accumulation and exploitation of Intellectual Assets (IA) - by which we mean everything that is not on a conventional Balance Sheet. In the Amazon published accounts they (rightly) draw attention to their substantial investments in "Marketing and sales" and "Technology and content". What they want us to believe is that these investments are valuable over the long(er) term and generating significant value. The questions which naturally arise are:

a. **For how long are these investments going to be valuable?** Clearly a technology and systems infrastructure that will be valid for 5-10 years is worth more than one that needs to be scrapped in 18 months time.

b. **What returns are these investments going to generate?** Understanding an appropriate methodology for addressing this is non-trivial but highly desirable. We believe that Sciteb's IAVA methodology, licensed to KPMG, has a useful contribution to make in this area. We have added tabs to the worksheet giving a very simple version of an IAVA valuation. This can be followed at the (IA_A) tab in the worksheet.

We:

i. **Estimate the levels of Revenue Investment.** For these purposes they are taken as 80% of the disclosed expenditure on Marketing and Technology from the Amazon published accounts. The % of sales (28%) is maintained until 2003 and then steadily reduced to 14% as the margins improve (so that half the margin improvement comes from reducing the revenue investment as a % of sales). This seems reasonable since eventually the customer acquisition costs for Amazon must reduce if it is to show any profit.

ii. **Take a view on appropriate amortisation rates.** For simplicity we assume that the effective amortisation rate for Amazon's IA is a uniform 25% - ie that 25% of their technology infrastructure need replacing each year, 25% of their customers switch etc.. (Obviously one would in practice make more detailed estimates based on specific consideration of the various different types of IA.)

iii. **Estimate an appropriate Economic Rent for Fixed and Working Capital required.** Amazon's published figures suggest that it has had negative conventional capital requirements (since consumers pay immediately and suppliers give credit). We assume, for consistency with the McKinsey paper, that this moves to the more conventional positive figure as Amazon gets bigger - and has to invest it its own facilities as stocks. For the economic rent we take a simplistic multiple of 8% of Book Value - again in practice more sophisticated estimates are made but this is good enough for the present illustration.

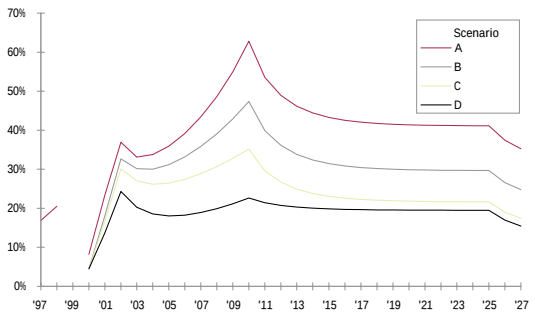
iv. **Derive the Value Added achieved with Amazon's IA (IAVA).** This is calculated as PBIT + Revenue Investment in IA - Amortization of IA - Economic Rent on Fixed and Working Capital. The reasoning is that Revenue Investment in IA above the rate required to replace amortised IA is essentially a discretionary use of economic value added, and that the value added from the IA is unaffected by whether the Fixed and Working Capital is owned or rented.

v. **Derive a Return on (Current) Intellectual Assets (RoCIA).** This is IAVA divided by the average Current IA employed in the period - analogous to RoCE.

4. Reading the RoCIA Graphs

Looking at the actual and projected Returns on Current IA in the four McKinsey scenarios gives the following picture (see the IA Charts tab on the worksheet for details).

Actual/Projected Return on IA



The figures for '99 are omitted because they are negative, due to distortions in the Amazon accounting/reporting systems. A real IA Analysis would remove these, but the ways of doing this are too complex to explain in this note.

The picture that emerges from this graph is interesting. It suggests that the superficially plausible Scenario A requires Amazon to increase its returns on IA from their historically achieved levels of around 20% to 37% and then to sustain a steady increase from 33% in 2003 to 63% in 2010, after which returns fall back a bit to about 42% but are sustained there for 15 years. This seems exceedingly unlikely. A highly visible competitor achieving such high returns is bound to attract new entrants and in the absence of very strong barriers to entry these returns are likely to reduce sharply. Furthermore the results and credible short-term projections give no demonstration of these returns being achieved. In the absence of compelling evidence to the contrary, looking at the IA positions suggests that Scenario A can be discounted entirely, and that scenarios C and D are far more plausible.

Thus a quick application of even a small amount of rigour about the Intellectual Assets that generate the cashflow reduces the uncertainty about Amazon's valuation from the $3-79bn range indicated by conventional DCF to a more reasonable $3-15bn (compared to the current market cap of $12.3bn). Of course one would in practice make a weighted average of plausible scenarios, as the McKinsey paper suggests, and one might want to include a version of Scenario B with a small weight as well, but what this note does demonstrate (so far) is that rigour about IA as the causes of cashflow can add a lot to the understanding of the valuation of dot coms.

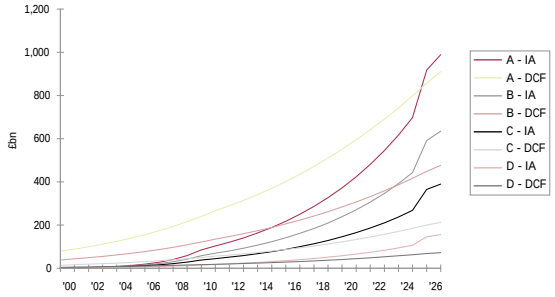
5. IA-Based Terminal Values

Another benefit of considering the IA of a business explicitly is that it gives an alternative approach to the Terminal Value problem which is a known serious limitation of conventional DCF valuations. If we have a set of IA with an historic cost *c* generating a return *r* and with an amortisation rate *a* then the cash it will generate in the *i*th time period is (approximately) $c(a+r)(1-a)^i$ and consequently the NPV of all its contributions at a discount rate *d* is $c(a+r)/(a+d)$. This enables us to calculate a Nominal Total Value of IA in any period if we assume that the average return of the IA held at the end of the period is equal to the current return. Hence the IA can be used to give a 'Nominal' Market Cap in an IA-based business which is:

Nominal MCap = Nominal Total Value of IA + Net Financial Assets + Net Fixed & Working Capital.

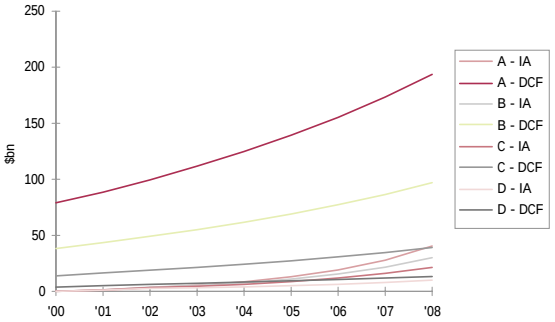
This ignores any accounting distortions in the rest of the Balance Sheet (which have to be dealt with if one is using this method in practice, but with IA-based businesses these assets are generally a small proportion of the total Market Cap) but has the advantage of not needing explicit longterm forecasts of cashflow. It is interesting to compare the Nominal Market Caps generated in this way with the NPV Market Caps under the various scenarios:

IA vs DCF Terminal Values



It will be seen that, in the highly optimistic Scenarios A and B, the IA Valuations remain considerably lower than the DCF valuations until towards the end of the forecasting period. This is because the IA approach looks at the value of the IA that the business actually *has* at any time, rather than assuming that a current ability to generate high returns on IA may be sustained indefinitely into the future.

IA & DCF Values to '08



Looking at the picture in the first 8 years of the forecasting period (which is probably longer than it is reasonable to forecast with much certainty in the e-world) it will be seen that the IA approach to terminal values gives much more conservative valuations than conventional DCF.

6. Conclusions

We hope that this note demonstrates that it is sensible to consider the impact of Intellectual Assets and their returns on valuation models of New Economy businesses. Looking at the Returns on Current IA provides a valuable sanity check in financial models, and IA-based Terminal Values can provide a useful corrective to potentially misleading 'business as usual' assumptions.

As noted in the Executive Summary, the nesd.org.uk Technical Working Group will be issuing a follow-up report in December 2000 on how to integrate DCF, IA and Real Options.

Sciteb
1 Hay Hill
Berkeley Square
London
W1J 6DH

Tel: 020 7381 1481
Fax: 020 7499 9253
www.sciteb.com

axiom design 020 7729 3444