

Making Sense of Irrational Decisions

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*“There are people who believe that, [new technology and globalization have repealed the business cycle] and it may turn out that that’s true. But there is another possibility, which is that all of human history may turn out to be true instead.”
Robert Rubin, former Labour Secretary, Clinton Administration
quoted in Freeman and Louçã, 2001*

1. Boom, Bust and the “New Competition”

1.1. The Un-realized Potential of the Internet

In the end, the dramatic fall of technology companies that took place in the early years of this century appears to be the failure of radically new applications being developed to use the new medium of the internet. This has been in part recognized in the following quote from the New York Times.

“The Internet is a low-cost communications technology. And a shopping site like Amazon.com is, in essence, a big database lashed to the Internet. There is, to be sure, plenty of marketing and technical innovation involved. But searching databases and processing transactions -- computers have been doing that for decades. It’s now obvious nobody yet knows how to create a successful, and truly new, medium.” (May 11th, 2003, pg. 4-5)

The technology bust, or more precisely for this thesis, the downturn in the infocommunications industry poignantly displayed that the hype behind ‘the new economy’ was exactly that: hype. As the opening quotation from Robert Rubin, former Labour Secretary in the Bill Clinton cabinet, implied: Business cycles still exist and demand appreciation.

Despite Nortel Chairman, and former CEO, Jean Monty’s assertion in 1998, that “our appetite for bandwidth is insatiable” (Monty, 1998, pg. 49) we did in fact reach a point of excess capacity. Some of the ideas about how we would use bandwidth, that have been floated since at least the late 1990’s, include the connectivity of everything to everything else. This meant that your toaster, refrigerator, furnace and pretty much everything else that you owned would be connected, either by wireline or wireless technologies, to everything else. Conceivable you could make toast at home when you are at the office or turn off the heat from the car. Clearly some of these ideas held, or hold, more promise than others but regardless

of their usefulness almost none of them are yet a reality for most consumers. Even digital labelling, which involves the insertion of a microchip into the Universal Product Code labels that are affixed to almost every product made (at least in the developed world) has been slow to be realized. This invention, it has been suggested, could do many useful things including eliminating the human operated cash register, vastly improve inventory management and provide consumers with such useful services as automatic notifications and/or reminders that the milk is getting low and you may want to pop out and get some more from the store. Alternatively, of course, milk could be automatically ordered from an internet grocery service and delivered to your door without so much as a thought. Many of these potential new products have been socially constrained by the concerns and desires of customers. The idea of everything in your refrigerator talking to the refrigerator that talks to the computer and on to the supermarket etc. has raised fears of “Big Brother” encroaching upon the private lives of people. How would firms use this detailed knowledge and what if ‘hackers’ were able to get a hold of this information?¹ Technology can only progress at the speed at which society accepts the new technologies.

The downturn has however not changed the basic perspective of many of the industry leaders, though they have had to change some of their operations in the short term. As John Chambers explains, “We felt the industry was going to consolidate and evolve into a network of networks and there was a chance for one company to break away. When the downturn did occur, we did soul searching for the first two months to determine was it us or the industry phenomena. We felt it was an industry phenomenon so we didn’t change our break-away strategy, but we did modify it with a six-point plan.” (Evans, 2002, Dec. 4, FP.1) The six point plan involved setting some traditional business targets such as profit, cash generation, productivity gains and attainable market share. They felt that these were areas that they could control and have worked towards attaining the targets.

1.2. The Financial Perspective of Economic Reality

The stock prices of technology firms have perhaps done more to raise interest in, awareness of, and distaste for, technology firms over the past ten years than any other aspect of the sector. Even the introduction of the now omnipresent mobile

¹ It is hard to imagine many nefarious uses of the knowledge of individual’s milk consumption but then we are dealing with a new reality here.

telephone into the lives of nearly every person in economically advanced nations, or the introduction of the internet into the work and private lives of millions of people, may not have risen the acute awareness of the sector on the part of the average citizen in the way that the stock prices of these firms have. Those who invested in technology firms in the booming late 90's could not help but boast every time their stock passed another milestone, or was split. Those who had to listen to this boasting but who chose not to invest in technology firms have often been equally as vocal in the time since the bubble burst. "Where is Nortel's stock now?" they might enquire, sometimes even feigning ignorance of any recent movements (which were usually sharply downward).

What did these dramatic fluctuations mean? Did they mean anything at all? Are the executives of these firms to blame for all this volatility? Are the investment analysts to blame? Were we all fooled or were we duped by some unholy conspiracy?

The aftermath of the bubble has been very difficult for technology firms, this is for sure. The major corporate scandals of Enron and WorldCom compounded the fear and anger of investors in technology companies generally. Even if these handful of scandals were by themselves insignificant for the whole global economy, the perception of wide spread malfeasance fuelled, at least in America, by a media that tends to exaggerate the negative aspects of the news seemed to create a general animosity towards the already difficult to understand technology firms.

The decline of the market value of the firms that have been at the centre of our discussion here Nortel, Alcatel, Lucent and Cisco have been awesome over the past four years, though retrospectively they should not be anymore awesome than the increases that were experienced prior. In a matter of a few years individual companies increased their market value by \$300 billion only to see about the same, or more, removed following the burst of the equity bubble.

In our discussion of the decline of the market values of these technology firms we must understand the wider movement of the stock market in the years in question. The firms in question here have not been the only firms to experience devaluation in recent times, as Figure 2.1 shows. The run-up of stock values, or the bubble as it has often been called, was a wider movement within financial markets of which technology firms, including Nortel, Lucent, Alcatel and Cisco were a major part. So too were the dot.com firms that attempted to develop countless types of website based business models. The dot.com model proved much harder to execute than anyone

anticipated, though perhaps in retrospect it was not all that difficult to have predicted these problems at the outset. Alan Greenspan had spoken out against what he called 'irrational exuberance' in 1996, four years before the market would peak. The term has become the leitmotif of the era, and has provoked much debate including the 2000 book of Robert Shiller by the same title.

Investors irrationally poured money into these firms who did their best to make use of the windfall that was not likely to continue forever. This said, the incredible rise of the stock, the sheer excitement about what the internet might become made it a very difficult environment to interpret. There were certainly excesses amongst many of the executives at the top of these firms, often times in the form of generous stock options that they were awarded as part of their pay, however, given that the valuations of the firms did not adhere to any of the generally accepted ratios for financial performance it is hard to quantify to what extent their actions were irrational, and as such it is also hard to determine if their salaries were any more irrational than the investment decisions of investors who had so inflated the stock prices in the first place. While it seems almost surreal that John Chambers realized total remuneration of \$375.8 million (US) between 1991 and 2002 as CEO of Cisco or that in one year (2000) John Roth, the former CEO of Nortel, realized just over \$100 million (US) in remuneration, but we have to remember that this was during a time when some entrepreneurs were becoming billionaires as a result of selling their firms to the Nortel and Cisco's of the world, in some cases after only a few years of work. Also, that both these men received such enormous pay packages is a testament to the competition for executive leadership during the era. Stockholders always had recourse against these packages, yet there was nary a comment about these being excessive at least in public, and at least until the bubble broke. Perhaps the individual shareholders were too busy attempting to calculate their own new found wealth with each upward movement of their stocks. Regardless of why they did not object we are left to ponder whether or not managers should act any more rational with their shareholders money than the shareholders themselves act?

The firms probably crossed the edge of acceptable optimism in their predictions for the future growth of their businesses and industries, and as a result are probably owed some of the criticism that they have received since their fortunes turned. In their defence, a number of 'respected' advisors including supposed specialists in the new infocommunications industry such as Dell'Oro had wildly

overestimated the growth of the market as well. When the optical transport sector of the market peaked at \$23 billion (US) in 2000, Dell'Oro had predicated that the market was bound to grow to \$57.3 billion (US) by 2005.² These predications, they say, were based on interviews with managers in carriers. Needless for us to say, they have had to make serious adjustments to their estimates since that time. We must recall that we are talking about a market innovation in the form of the internet, which made it difficult to predict, using historical information, what the future would hold. Marshall McLuhan's famous quote "We look at the present through a rear-view mirror. We march backwards into the future."

The market valuations of firms such as Nortel, Cisco and Lucent were clearly out of line with any accepted financial standard. As was argued in chapter two, the projections for the growth of internet use were beyond any justification. Once everyone was on-line all the time you would have a limit to the usage. Scepticism would not rule the day in the stock market run of the late 90's.

For Nortel, Lucent and Cisco the irrationality of the stock market provided a rare opportunity to use their grossly overvalued stock to purchase all the promising young companies and technologies that they could possibly desire. That each of the large firms was in a similar situation at about the same time led to a ferocious competition to snatch up firms before their competitors did. Again, we do not believe that the executives of these firms fully appreciated that their stocks were enormously over-valued and that a sharp and deep correction was bound to occur. The companies appear to have merely responded to the challenge of their inflated valuations, the excitement for this new technology and the potential that it suggested.

The challenge in interpreting the strategies of this period comes when we consider the responsibility of the managers and directors of these firms to be good guardians of their shareholders value. It must be remembered that most of the acquisitions in question were paid for with the acquiring firm's stock, not by using existing cash reserves or debt equity. As such, the firms never experienced a serious debt crisis even through the worst of the downturn when assets were being written down as quickly as possible.³ Issuing billions of dollars of shares diluted the

² This figure was presented in a January 18th, 2001 press release by the company and quoted in Carpenter, Lazonick and O'Sullivan, 2003, pg. 1015.

³ For example in 2003, Nortel had net long-term debt of \$3.7 billion (US) with over \$15 billion (US) in assets. Similarly, Lucent had net long-term debt of \$4.4 billion (US) again with over \$15 billion (US) in assets.

ownership base dramatically. In thinking about these acquisitions, it is therefore important to key on the goodwill components of the valuation of the firms that were purchased. Determining this portion of the price is an inexact science to say the best, because it is necessarily tied to many future oriented assumptions, including the potential growth of the business, the innovative potential of the employees that are being hired and even the value, if any, of the target firm's brand and as we just explained, with market innovations such as the internet it is very difficult to predict the future. In reality, and in particular in 2000, the rate of acquisitions was so high that while there were few bidding wars for firms, the fear of a competitor purchasing a target if you didn't was a real threat and a driver of the goodwill valuations of target firms. We should also remember that in 2000 the market value of firms such as Nortel was over \$300 billion. In this environment, an extra \$3 billion in goodwill is not necessarily such a big concern relatively speaking, especially given the rate at which Nortel's (for example) own stock had risen.

At Nortel the worst acquisitions from a value creation/destruction perspective were χ ros (pronounced Kyros), Alteon, Qtera and EPiCon. The firm wrote down over \$12.4 billion (US) in goodwill assets associated with these acquisitions alone.⁴ This is actually not all that surprising given that of the \$3 billion (US) that it paid for Qtera, for example, \$2.6 billion (US) was goodwill. (Roseman, June 20th, 2001) The company had paid \$3.23 billion (US) for χ ros for access to a particular optical technology. At the time this may have even seemed reasonable to pay this much because the firm had developed an all optical switch that could reduce the total cost of fibre optic transmissions by reducing, if not eliminating, the need for boosting stations which amplify light signals as they travel over long distances. Lucent had already developed a similar product and was testing it in the market, which spurred Nortel to act quickly. Interestingly, the technology is only now considered feasible and recently a new start-up firm has attracted venture capital to fund the development of a similar product. This new start-up, called Lamda Optical Systems, in the words of an industry journal, "could have been squished between Lucent and Nortel." (*Fiber Optics Forecast*, 2004, Vol. 14, Iss. 7) During the bust and the massive scale-backs both Nortel and Lucent backed out of the development of this product. It has been

⁴ As indicated in the original annual report of 2001 for Nortel. The revised figures for this year are still under investigation, as previously noted.

suggested that the technology is “still floating around in a Nortel lab somewhere, but it’s future is unknown.” (Fiber Optics Forecast, 2004, Vol. 14, Iss. 7)

This sample raises our first key observation and concern for the process of downsizing that has taken place across the industry but in particular, with reference to Nortel (the subject of chapters 5 and 7), which is the issue of what has been lost in the desire to “return to profitability.” The goodwill portions of prices paid for many of the acquisitions made during the 1998-2000 spree were clearly much too high, at least in light of the morning, however, the technologies that were being developed, such as the light switch from χ ros are important future technologies that might have been lost in the downsizing process. Given our foregoing discussion of the environment that existed at the time, however, the decisions made in the dark of the time may not have been irrational relatively speaking. When Nortel closed down the χ ros unit analysts believe that the product was simply ahead of the market at the time. (Dubowski, 2002) The question now that Lamda Optical has received venture capital funding for the development of a similar product is: Will Nortel be able to restart this cutting edge technology now after all of the layoffs that have been made and after the product sits on a shelf for a few years? The prospects are not encouraging. As Robert Reich has said “once off the technological escalator it’s difficult to get back on.” (Reich, 1987, pg. 64, quoted in Cohen and Levinthal, pg. 137)

Firms used their highly valued stock as currency to buy a new future as Carpenter, Lazonick and O’Sullivan (2003) have argued. What realistically were their alternatives at the time? Remember that the run up in the stock was not as a result of booming profits. It was not a situation where the firms could have returned the value represented by the firm to the owners in the way that Microsoft has done in late 2004 through its massive dividend payment. Had they not attempted to use the excess capital to purchase other firms the decline in the valuations of their stocks would almost certainly have still occurred. The downsizing costs may not have been as great, however, none of these firms were ever really in threat of going bankrupt, despite the frequent comments that suggest just such a fate in the press, as a result of the downsizing and it is hard to believe that many of the firms that they acquired would still be alive today if they had not been acquired by the larger firms. The selling of many of the firms, particularly the younger firms that had been supported by venture capital, released a great deal of capital back into the new-firm creation mechanism. While many of the venture capital firms, particularly the American venture capital

firms, have been reluctant to make sizable investments into the industry in recent years, it is not because they have not had the resources to do so. Rather, the venture capitalists have not been convinced that there are many great new ideas out there in the infocommunications industry and have instead been investing in biotechnology firms. The overcapacity issue that we previously discussed is a major part of this. More content is needed to fill the pipes that have already been built before any major new investment into the infrastructure – to which Nortel, Alcatel, Lucent and Cisco supply – investments will be considered.

Carpenter, Lazonick and O’Sullivan feel differently about this issue of the possibilities that firms had at the time. As they have questioned:

“However irrational the stock market as an allocator of cash to innovative companies, the interesting question that this study raises is the rationality of the major optical networking companies in failing to take advantage of their high stock prices in the speculative boom to load up on cash, and thus make themselves less vulnerable to the bursting of the bubble. After all, US corporations had behaved this way in the speculative boom of the late 1920s (O’Sullivan, 2003), and, in more recent history, major Japanese corporations had sold massive amounts of stock in Japan’s ‘bubble economy’ of the late 1980s (see, for example, Ide, 1998: 83-4; more generally, see Lazonick, 1999). Had it not been for this financial behavior, the adverse impacts on these corporations of the subsequent downturns—in the USA in the early 1930s and Japan in the early 1990s—would have been far more severe. Why, then, in the New Economy boom, did strategic decision makers in the optical networking companies eschew the opportunity of selling stock to strengthen their cash balances?” (Carpenter, Lazonick and O’Sullivan, 2003, pg. 1025)

Just as the boom was unpredicted so too was the extent of the decline. At the end of the fiscal year 2000, Nortel for example had \$16,530 million (US) in current assets, including over \$1.6 billion (US) in cash against total current liabilities of \$9,058 million (US).⁵ Just how much cash should the firm have attempted to accumulate, given that the size of the decline had not been predicted by anyone?

⁵ We note once again that Nortel is due to release revised financial documents going back at least to 2000. We are working with the figures that were available as of December 2004. It is acknowledged that the current assets portion of the balance sheet is likely to be revised, in particular the accounts receivable which totalled over \$ 8 billion (US) on the existing annual report. This said, we do not believe that argument will change substantially with the release of the new figures.

The authors go on to suggest that, “It would take a separate study to generate the evidence required to answer this question.” (Carpenter, Lazonick and O’Sullivan, 2003, pg. 1025) We suggest that this is unnecessary and that the authors may be attempting to exercise an undue degree of conservatism in offering a solution to the question that they ask. The answer is given in the foregoing quotation, specifically that they are questioning why managers all from ‘western’ economies in the optical networking (or infocommunications industry in the language that we have adopted in this piece) in the late 1990’s did not act in the same way that manager from 1920’s America or 1980s Japan did. Quite simply they are comparing apples to oranges to bananas. First, the issue of culture is of great importance. (Hofstede, 1980; Trompenaars, 1994) Studies abound on the differences in management approach and strategies between western and Japanese firms. Suffice to say that the differences between Japanese and American (and western more generally) cultures mean that managers will operate differently in these two different situations. We recall that the success of Japanese firms has traditionally been in imitation, not in innovation, or at least in the introduction of world first innovations. Japanese firms, while heavily reliant on development are not research intensive and the optical networking, or infocommunications, industry of the late 1990’s was highly research oriented. We note that, for example, no major Japanese player existed, or presently exists, in the research and development or design areas of the infocommunications industry, with the possible exception of Fujitsu who is a distant competitor in most segments of the industry. Similarly, it seems unreasonable to equate the management decisions of firms from the 1920s to the 1990s. Path dependency and industrial differences are significant and even though the incumbent firms that we have discussed, Lucent, Nortel, and Alcatel claim roots back one hundred years, each of them, in their own way is a new firm. Lucent was spun-off from AT&T, headed by a new CEO and confronting a radically different, and more competitive and innovative market, and then it had in its previous existence. Nortel was also separated from Bell Canada in the late 1990s and faced a similarly new environment. Likewise, the name Alcatel did not exist until the mid-1980s and even in the recent past the firm has undertaken a radical restructuring of its operations, selling-off non-infocommunications industry aspects of the firm in an effort to better specialize on these core competences. Furthermore, the institutions that regulate financial markets, let alone management theory have progressed a great deal over the intervening 80 years.

Beyond these obvious differences, however, we believe that the position of Carpenter, Lazonick and O’Sullivan is guided by a fundamentally wrong conception of the world. This conception could be understood in two forms, both of which would potentially lead to the conclusions that they do in their article. The first form is the profit maximization assumption that we discussed in chapter three, and which we discuss further in the next chapter. In this version, the authors would have us believe that the managers of these firms were fundamentally guided by a desire to maximize the profits realized by the shareholders of the firm. If we assume this, then in order for there to be a question regarding why the managers did not seek to make strategic decisions that would benefit the shareholders, we also need to assume that the managers should have reasonably expected their stock values to dramatically decline in the near future. If they did anticipate a landslide of the market price of their stocks then they would have attempted to issue additional stock to the market, rather than issuing it to the firms that they were acquiring (as a form of compensation or cash in the arguments of the author) and then to use that stockpile of money to buffer the well anticipated decline in their business. Technology industries such as the infocommunications industry, however, have not been oriented towards dividend payments, nor have the successful firms been as concerned about potential declines as to suggest that this would be a routine action on the part of executives within these firms. The wealth generation prospect for the owners of technology firms has always been held in the potential for the stock prices to rise, not in the likelihood that the firm was going to distribute residual funds back to the owners. Cisco, as Carpenter, Lazonick and O’Sullivan note, never issued dividend payments. Microsoft has only now issued its windfall dividend, and only because its cash reserve had grown to such an extent that it could not reasonably justify its existence and any acquisitions that it could consider to use this stockpile for would draw the concerns of already hostile competition authorities internationally.

The second form in which we could understand the conclusions of the authors is through the lens of opportunistic behaviour, of the sort that Williamson is apt to warn against. This may be closer to the basic argument that they are attempting to make in their article as witnessed in the following quotation.

“If, however, as seems to have been the case, stock-price performance was primarily dependent on speculative trading activity, it created an incentive for those with strategic control who were positioned to reap significant stock-

based rewards to make allocation decisions that could benefit themselves even if other participants in the corporation, particularly career personnel who eventually found themselves unemployed, ultimately had to pay the price.” (Carpenter, Lazonick and O’Sullivan, 2003, pg. 1026)

If the senior management was truly acting in an opportunistic way then we would have to assume that John Roth, for example, did not care what people thought of his tenure as CEO of Nortel, for if he rationally acted in an opportunistic way then he would have to have expected that his behaviour would be recognized as such and his reputation would ultimately be that of an opportunist who did not care about either his staff or his shareholders. This is a harsh assessment to say the least and more likely highly irrational. If Roth, for example, was so driven by opportunistic desires why would he have ever chosen to work his entire life within a Nortel that was essentially a sole source supplier to a telecommunications monopoly in Canada, during most of that tenure? Did he anticipate deregulation, the internet and the ability of Northern Telecom to become an independent firm worth over \$300 billion (US)? Perhaps, it could be argued that he only acted in an opportunistic manner when the situation presented itself. While this is more probably than the previous explanation, it would still require Roth to know, or reasonably expect, that the firm’s stock price would rise to the heights that it did, and to then decline in the way that it. Again, we recall that the stock market boom was irrational, therefore we are bestowing upon Mr. Roth a high degree of insight into improbable futures, especially when we consider that the acquisition and transition strategy that he executed was begun at a time when the firm’s market value was, more or less, about what it is today. **[check details of this]**

Finally, both of these approaches are premised on an orthodoxy economist’s perspective that there exists only one optimal solution to any economic problem. This means that there is one strategy that will produce the best possible result. This is not the case, as David House, former CEO of Bay Networks and President of Nortel indicates in the following quote. “But the best decisions are just-in-time decisions. You should decide as late as possible – but before you need to take action... People can spend months debating the ‘best’ decision without actually arriving at any decision. Every decision involves risk. And if there are 10 ways to do something, eight of them will probably work. So pick one of the eight and get going. Life is too short. You have 10 more decisions to make after this one.” (quoted in The National

Post, 1998, Oct. 29, pg. C.5) We believe, that neither of these two forms of their argument accurately reflects the environment in which the events actually took place. Opportunistic behaviour requires knowledge of the future which is easy to assume retrospectively but much harder to have a priori.

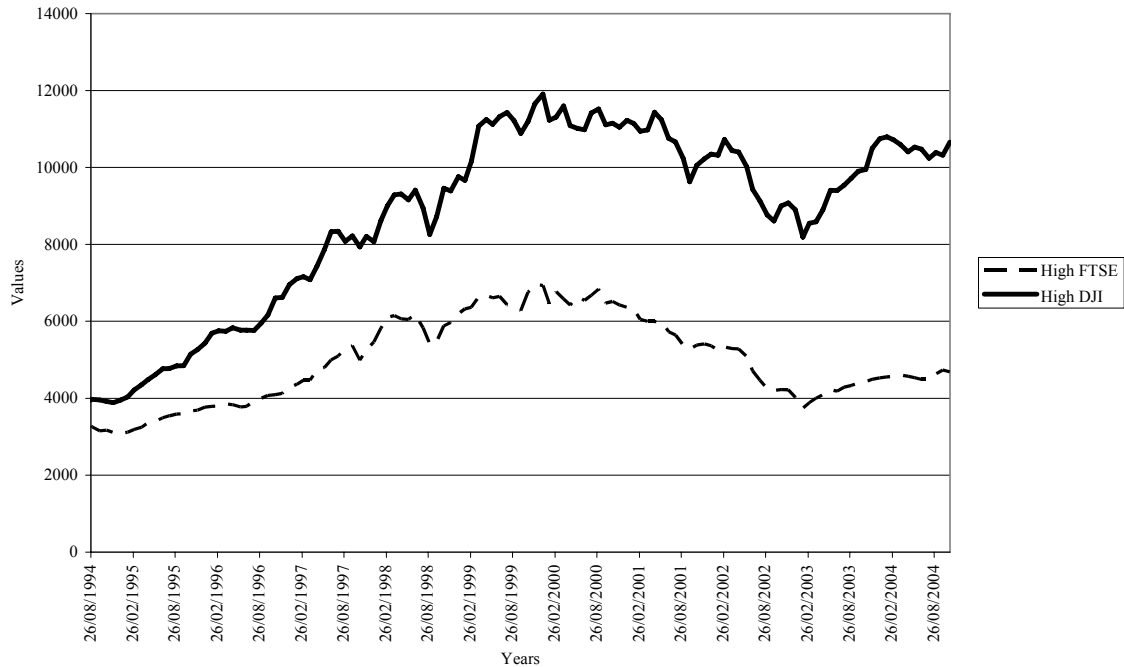
We feel further obliged to point out a number of other critical problems with regards to some of the assertions made in the work of Carpenter, Lazonick and O'Sullivan (2003) specifically with how they believe accounting regulations and the ability to use the stock market tilted the field of competition towards North American firms during the boom of 1998-2000. As they said,

“The fact Alcatel was listed on NYSE, using American Depository Shares (ADSs)—an equity-based security that permits a foreign-based company's shares to be traded in US dollars—made its stock more attractive to the shareholders of the North American companies that it acquired. Alcatel is the only incumbent optical networking company outside of North America that in the New Economy boom of 1998-2000 was able to use its stock as a currency to acquire companies and compensate non-executive employees on a significant scale. For example, unable to use its stock as an acquisition currency, in 1999 Marconi (then called GEC) expended more than \$6 billion (US) in cash for two US data communications companies (Fore and RELTEC) (Mayo, 2002).” (Carpenter, Lazonick and O'Sullivan, 2003, pg. 1005)

It is not entirely clear what is meant by this, whether for example, they are referring to the rise in the values of American stock markets (driven by the rise in US-based equities such as Alcatel's NYSE listing) or if they are attempting to link this to the accounting rules which allowed firms to keep goodwill off certain all stock purchases (through the aforementioned pooling of interest provisions). The first is certainly true as Figure 8.1 shows, though, it must be remembered that stock markets were booming around the world. For example, comparing (somewhat arbitrarily) the gains realized by the New York stock exchange from August 1994 (around the time that markets began it's strong climb) to June 2000 (the month that Alcatel purchased Newbridge and around the time that both North American and European stock markets peaked) to the Financial Times 100 index of the London stock exchange we note that while the American exchange had risen by 278% over the period, the British exchange had risen by only 202%. Still, non-American companies were facing an

environment that was supportive and in which they certainly were able to issue new stock etc. in order to raise additional funds for acquisitions.

Figure 8.1: International Comparison of Stock Market Movements 1994-2004



Source: Yahoo! Finance

The second aspect of their argument regarding the use of pooling of interest provisions also requires further discussion. First, the primary benefit to the firm of the pooling of interest provision is that it keeps the goodwill charge off of the firm's balance sheet, where it would be recorded as a depreciable asset. In the absence of this provision, and with the goodwill charge on the balance sheet, the firm's earnings per share performance metric is negatively affected. The earnings per share ratio, as it has been argued, is a very important measure of the overall performance of the firm, and the inclusion of the goodwill asset on the balance sheet, which would then have to be amortized over a twenty year period unduly depresses the impression of the overall effectiveness of the firm to both present and future investors. (Wallman, Wallman and Aronow, 1999)

This would be an important consideration to make if investors, present or future, in technology firms were concerned about the effectiveness of the firms that they invest in, in the same way that investors in most traditional sectors are. They are, however, not so inclined. Investors in technologically-intensive firms, even centurion firms such as Nortel, Lucent and Alcatel, are primarily concerned with the future

earnings, or potential of the firm, which is fundamentally tied to the successful commercialization of innovations. As Carpenter, Lazonick and O'Sullivan readily acknowledge "Cisco pays no dividends." (Carpenter, Lazonick and O'Sullivan, 2003, pg. 994) There is no evidence, either in the article of Carpenter, Lazonick and O'Sullivan, nor anywhere else, to suggest that the rise of Cisco's stock was based on its strong earnings per share ratio, nor did Cisco appear to worry about the diluting effect on the earnings per share ratio, that issuing new stock to pay for their acquisitions would have. It has, alternatively, been argued that investors were caught up in an irrational run on the stock market based primarily on the momentum effects of successive periods of strong growth in financial markets as well as the excitement for how the internet would provide opportunities for businesses to increase revenues, especially for those firms such as Nortel, Lucent, Alcatel and Cisco who were building the infrastructure required to make the internet available and affordable for everyone.

Foreign firms, while not being able to use the pooling of interest provision, did have at their disposal a number of other accounting measures, which it has been argued, "put the U.S. at a disadvantage when competing with foreign companies for a U.S. target." (Dunne and Nubizu, 1995, pg. 362) These advantages included the ability to write-off goodwill against stockholders' equity rather than writing it off against earnings, as was the case in the US in the past in situations where acquisitions were not fully (i.e. 100%) paid for with stock, as Carpenter, Lazonick and O'Sullivan (2003) indicate Cisco did on some occasions. A second potential advantage for foreign firms is the ability, in some jurisdictions, to deduct amortization against taxes. For these two reasons, Dunne and Nubizu (1995) found that "Foreign acquirers that charge goodwill against equity (bypassing the income statement) appear to make greater wealth transfers to target firm shareholders than acquirers charging goodwill against earnings" (Dunne and Nubizu, 1995, pg. 370) and furthermore that the ability in some jurisdictions to deduct the goodwill expense against taxes, put US firms "at a disadvantage as they competed for corporate control of domestic companies." (Dunne and Nubizu, 1995, pg. 371)

The stock market, as a result, certainly encouraged and promoted the development of these firms and if it did not facilitate the growth of the market for corporate control of so many new technology start-up firms, it certainly increased the premiums paid for the firms that were bought. Discrepancies in how firms are

required to account for their activities have historically, and continue to, create opportunities to exploit these discrepancies to the advantage of individual firms, particularly across regulatory boundaries. The discussion of pooling of interest accounts, which have since been abolished in the US, and of the amortization of goodwill illustrate one way in which this was done in the past.⁶ The nature of competition in technology-intensive industries is driven by technological possibilities and the visions of the entrepreneurs within firms to imagine how these possibilities can be made real through society's acceptance of technological products.

2. Some Implications of the Research for the Mergers and Acquisitions Literature

The divide between the economic research that attempts to 'reveal' strategies, what decisions tend to produce successful results on average, and the more normative and case-based theories of individuals such as Prahalad and Hamel (1994), Dorothy Leonard Barton (1995) and many of the *Harvard Business Review*, or similar publications. Anne-Wil Harzing (2002), for one, has started to bridge this gap by incorporating the typologies of corporate strategies of Bartlett and Ghoshal (1992). For example, she attempts to consider how the expressed strategies of a firm, a multidomestic strategy versus a global strategy etc. affects their decisions regarding how to enter markets, via acquisition or greenfield investment. We applaud boundary spanning studies such as this and feel that continued efforts to bridge the divide between these two approaches to research is likely produce more practical and specific advice for practitioners.

As we have previously argued, the fear that many economists have for acquisitions and mergers, the fear that market power will lead to adverse economic outcomes is not particularly relevant for technologically intensive and dynamic industries. Firms simply do not operate in the way that the profit maximization and opportunistic ways that are suggested by most theories. We find support here in the words of John Chambers on the issue of mergers with competitors. "We use acquisitions to enter new markets. We don't acquire our competitors. If you ever acquire a competitor, you'd want to kill your own product line because your

⁶ It may be interesting to note that the decision to prohibit pooling of interest accounting was driven, in part, by a desire "to promote the international convergence of accounting and reporting standards for business combinations." (FASB, August 5th, 2004, pg. ii)

overlapping products not only add inefficiency to the process but puts your customer in a no-win situation.” (quoted in Evans, 2002, Dec. 4, pg. FP.1)^{7,8}

The challenges of radical innovations that were discussed in chapter four (in particular those that were outlined in table 4.3) could generally be seen supported by the research in this thesis. We note that Nortel, Lucent and Alcatel all had a chance to move much more quickly into the infocommunications industry and to do so internally had they been better at identifying the timing at which the radical technological changes were to take place. We are not so concerned about the money that was spent to acquire the data networking firms (given our discussion of the irrationality of financial markets at the time) but that the process of market innovation through acquisition, in the way that Nortel, Lucent and Alcatel executed the process, appears to have been less effective than Cisco’s. Even though Cisco used acquisitions to piece together competences it did so in a much more gradual way, by acquiring smaller firms which were easier to integrate into Cisco. The process was also more gradual, which given the knowledge creation processes described by both Nonaka and Cohen and Levinthal, were probably more effective than the dramatic approach of Nortel, Lucent and Alcatel via acquisitions.

The distinction that Haspelagh and Jemison (1991) make between domain strengthening, domain extending and domain exploring is particularly useful for our thinking about acquisitions in the infocommunications industry. We see elements of all three in the various acquisitions that were conducted during the period which we have investigated (1998-2000). The acquisition of Cambrian strengthened Nortel in the area of DWDM and metro optical. Bay Networks extended Nortel’s into the domain of data networking and was a market innovation for the firm. Alcatel’s purchase of Newbridge was also domain extending. The problem is that very few have adopted this approach to the study of acquisitions.⁹

⁷ We note that one comment on behalf of one industrial leader can in no ways be conclusive proof of the motivations of all executives leading firms in the industry, however, our observations of the dynamics of this industry appear to confirm that most firms had similar motivations – that is to grow markets – for almost all of their major, and most minor, acquisitions, in the area.

⁸ With regards to Cisco ever acquiring one of its competitors such as Nortel, Lucent or Alcatel, Chambers goes on to say that “It is unlikely we would acquire a very large player in the industry – cross culture, cross geography. I just don’t know how to make them work.” (Evans, 2002, Dec. 4, FP.1)

⁹ The work of Karim and Mitchell (2000) is one of the few exceptions.

2.1. Cisco's Success

It is still somewhat befuddling that Cisco has achieved greater success than Nortel, Lucent or Alcatel through the convergence era (and up to today). Each of these firms had undertaken major transformative changes in order to realize their market innovation. This involved learned abilities with new, rapidly changing technologies and new types of customers (carriers or service providers in the case of Cisco and large and smaller enterprises in the case of Nortel, Lucent or Alcatel). All firms had to adjust their product offerings, either reducing their development times, as in the cases of Nortel, Lucent and Alcatel, or increasing the scalability and reliability of their products as in the case of Cisco. These fundamental organizational changes that were needed in order to enhance their dynamic innovative capabilities appear to support the views on dynamic capabilities described by Nelson (1996).

It is interesting to note that firms have been attempting to beat Cisco through acquisitions for some time. The deal that brought together WellFleet and SynOptics as well as 3Com's purchase of Chipcom (for \$775 million (US) in 1995) are examples from within data networking of this trend and of course the acquisitions that we studied in chapters five and six were also directed towards these ends.

Many opinions could, and have, been offered on the critical aspects of Cisco's success. Their ability to acquire new technologies and to use these acquisitions as a form of external R&D is one possible reason for their success.¹⁰ The firm has consistently followed a strategy of purchasing firms that are geographically¹¹ and culturally proximate to their base in Silicon Valley, are small, relative to Cisco, and using stock to pay for them. Even the aggregate data from across industries suggest that this is the best way to conduct acquisitions. It can also be argued that the firm has greatly benefited from its Silicon Valley origins, one of, if not the, most successful regions in the world at developing radical innovations because of its robust, and

¹⁰ The following quotation from Hitt and colleagues is directly to this point. "firms following an active acquisition strategy may use acquisitions as a substitute for internal innovation. Managers often perceive internally developed innovation as entailing a high risk because of the low probability of success and the length of time required for new innovations to produce adequate returns." (Hitt et. al. 1996, pg. 1089-1090) Utterback has also suggested that frequent acquisition can facilitate a more organic form of the firm, which certainly applies in the case of Cisco. (Utterback, 1995)

¹¹ Nelson and Winter (1982) claim that most of the detailed knowledge of organizational routines and objectives the permit an R&D lab to function is tacit which implies that distant M&A such as the ones that tended to be conducted by Lucent, Nortel and Alcatel would be that much more difficult than the primarily Silicon Valley based acquisitions of Cisco. von Burg and Kenney (forthcoming) have also suggested that of the few acquisitions that Cisco has made that were not successful most tended to be geographically distant from Cisco's base. **(get page reference)**

distributed, regional innovation system. Indeed, Cisco spun-out of Stanford University and epitomized all that was desirable to the 'creative class.' (Florida, 2002) As a result, the firm has consistently been able to retain employees, even after acquisitions which is essential, since, as we have previously argued, firm's in this industry tend to determine the value of an acquisition, the goodwill portion at least, based on the knowledge and abilities of the people who work at the target firm. Furthermore, Cisco's structure could be described as relatively more organic than the structure of Nortel, Lucent and Alcatel which it has been suggested to be a more appropriate for dealing with periods of rapid change. (Cohen and Levinthal, 1990, pg. 132) Cisco may have even benefited in being a young firm in an industry that was undergoing rapid change and as result could have been perceived to be the most innovative and customer oriented firm in the new infocommunications industry. The firm certainly attempted to create this young and nimble image and to an extent it appears that it was, and is, more able to adjust to meet the needs of the market.

The aspiration levels of Cisco could be a further explanation. As Cohen and Levinthal (1990) have argued in terms of reactive and proactive modes of firm behaviour. Do firms actively search for new opportunities, as Cohen and Levinthal have suggested HP and Sony do, or are they more reactive to the environment? It is the sort of strategic advice that would come from the scholars who have looked at radical innovation such as Hamel, Prahalad, Christensen and Utterback.

An additional issue arose in an interview conducted for this thesis, the issue of the software that runs on Cisco's routers, the so called routing codes. Cisco's early dominance in the area of routers has been self-renewing because Cisco's routing codes have become the industry standard. This, however, could change in the not so distant future as it has been suggested that Intel, the chip maker, is planning on developing chips to replace the software that runs on Cisco's routers. Chips, or hardware are able to process functions at a much faster rate than software and in the area of chip design there is no one better than Intel. Time will tell on this front.

The case studies have shown that at least at Nortel there have been some significant problems involved in executing their acquisitions strategy. Lucent and Alcatel do not appear to have fared much better. Cisco's location in Silicon Valley, their embeddedness in the region, was probably an advantage because the area was so developed in a wide area of IT technologies. Acquiring firms close their research base was not as difficult as Nortel, Lucent or Alcatel all of whom had their research bases

elsewhere. Even for Nortel who had a presence in many locations and a global centre in Ottawa, which had and has, a large mass of firms in some of the areas of IT technologies that were necessary still did not have the sort of regional advantage that Saxenian talks about. (Saxenian, 1994) The three former telecom equipment firms also reacted relatively late to the convergence of technologies. Recall from chapter two that Cisco began acquiring voice competences back in 1994 giving them a few years head start on its larger competitors. The net result of these issues is that the problems that Nortel, Lucent and Alcatel faced, to an extent, could have been anticipated by the existing literature on acquisitions. Specifically, they tended to acquire large firms, not geographically proximate to their base and with cultures that were often times far different from their own.

3. Insights for Future Research

The acknowledged frustration of researchers who have attempted to study acquisitions as specific events, typically from a financial perspective, let alone the criticisms by those from outside of this perspective as to the usefulness of this approach demands redress. The case based research in this thesis has only further shown the problems, or limitations of using aggregate data to develop recommendations or even generalizations for such complicated industrial and firm specific decisions. The environment of the infocommunications industry during the period of 1998-2000 had many unique characteristics, such as irrational market valuations of firms, the introduction of a radical technological innovation (in packet-switched-IP networks) resulting in a market innovation of both the former data networking firms (Cisco) and telecommunications equipment manufacturers (Nortel, Lucent, Alcatel) who all moved into the infocommunications industry. Add to this the emergence of what could be the transformative social, business and economic technology in a hundred years in the internet (which was of course driven by those packet-switched-IP networks) and you have situation that most business executives, industry analysts, let alone the general public could hardly comprehend.

The discussion of strategic versus financial controls while useful in considering the general tendencies of firms who are making acquisitions across the economy is not useful in our consideration of the infocommunications industry because firms in technologically intensive and dynamic industries are not focused on financial control measures. This may change as industries mature and the rate of

technological change decreases, but at this point the industries would not fall into the category of technologically intensive and dynamic industries. We believe that the characteristics of technologically intensive and dynamic that we have attempted to develop in this work, including the role of market innovation, remain applicable today in the infocommunications industry but may also find support through the study of other industries where technological change is rapid. There is therefore a challenge to future research to investigate if the characteristics observed here are applicable to other industries.

Acquisitions in technologically intensive and dynamic industries have some fundamentally different motivations than the ones that have been typically identified for study. As John Chambers of Cisco clearly says, “A lot of people forget the purpose in acquisitions. What Cisco acquires when we buy a company is the people and the next-generation products. While current revenues are relevant in determining a company’s price in the stock market, they aren’t nearly as important to us as determining what future revenues will be generated from the new products.” (quoted in *The Ottawa Citizen*, 1998, Sept. 2, pg. H.7) The quote is in keeping with the

The way in which we have studied market innovations, to our knowledge, is unique. The works on radical innovation (Leifer *et. al.*, 2000; Utterback, 1995) have tended to focus on radical technological innovations. Innovation studies in general has a bias towards technological innovations and while there were certainly very important innovations involved in this study, the focus has been on the transformative process that the firms involved traversed. The process is one that every firm will face given enough time for the environment to change and as such is of the utmost importance to firms in the long-term. This process requires further exploration through research.

Marks and Mirvis’ (1998) predicted relationship between cultural differences and potential conflict (as depicted in figure 4.1) proved very useful and was confirmed by our research. By keeping acquisitions small and almost always geographically close to their base of operations, Cisco appears to have experienced almost an ideal amount of cultural conflict (some but not too much) resulting in positive outcomes. In the cases of the larger acquisitions by Nortel and Lucent, the level of conflict seems to have been excessive, resulting in relatively poorer

outcomes. Furthermore, we found that the ‘reverse engineered’¹² approach to cultural change that was attempted in the Nortel-Bay deal was fraught with problems.

4. The Future of the Infocommunications Industry

The market has also not fully converged and Cisco has not been able to lead in many areas of wireless technologies, optical networking and other carrier related business. Nortel, Lucent and Alcatel, on the other hand, while not enjoying much growth in the enterprise business have been able to maintain many of their relationships with carriers and/or service providers, and as a result of the changed market, have been able to earn revenues servicing old circuit-switched systems for much longer than they had originally anticipated.

The decision to reduce research and development spending by Nortel and Lucent is perhaps more concerning for the long-term viability of the firms than any other factor. Nortel’s new Chief Executive Officer, Bill Owens has set a target of higher gross margins for the firm but unfortunately has decided to pursue this target through cost cutting measures. This is exactly the type of actions that Prahalad and Hamel advised against in their 1994 book, which was published at the end of the last technology downturn. In 2001, Cisco surpassed both Nortel and Lucent in terms of spending on R&D. (Carpenter, Lazonick and O’Sullivan, 2003, pg. 986)

Carpenter, Lazonick and O’Sullivan have argued that even beyond the ability to purchase other firms with its own highly inflated stock, Cisco has further used the stock market as an important insurance policy against employee departures. Issuing stock options has been a tradition since the early days of Cisco, and the corporation has continued to adjust and adapt the policy to the changing environment. As witness to the significance of this plan, when Cisco’s stock peaked in 2000, 4,000 Cisco employees were paper millionaires. (Avery, 2000) When options were sent under water¹³ with the drop of the stock’s value, the corporation issued new sets of options and also undertook an aggressive stock repurchasing program, spending billions to acquire back its own stock. This of course, refilled their coffers so as to make future options possible. Cisco has by far led the market in this regard.

¹² As depicted in table 4.6.

¹³ When stock options are under water, the market price of the stock has sunk below the purchase price of the granted option.