12

Corporate Upsizing:The Evolving Role of DSS in Mergers and Acquisitions

A. M. McCosh
The Department of Business Studies,
The University of Edinburgh, William Robertson Building,
50 George Square, Edinburgh EH8 9JY
Tel: +44 131 650 3801 Fax: +44 131 668 3053
e-mail: a.mccosh@ed.ac.uk

Abstract

The history of DSS within the mergers and acquisitions movement is reviewed, and the number of changes which have taken place over thirty years is found to have been rather limited. The financial models have changed slightly, but the only major changes have been in database availability. The problem of where to search for the next step is addressed, and the suggestion is offered that the next important DSS area will lie in the softer sciences. Problems of organisation fit, personnel policy, and structure continue to be areas of serious difficulty during merger implementations, and that provides a fertile field for DSS professionals to plough.

Keywords

History, Mergers, Acquisitions, M&A, DSS, Corporate Control

1 INTRODUCTION

Thirty years ago, almost to the day, an article which I co-authored on this subject was published in the journal "Mergers and Acquisitions:- The Journal of Corporate Venture". The summer of 1967 was the high noon of the last-but-two merger wave. The article, entitled "The Use of Computers in Merger Analysis", was the first paper to be published on the subject. It seems reasonable to examine what progress we have made in the last thirty years. Has the Decision Support System concept moved forwards, or backwards? Has it, indeed, moved at all? If it has, which are the areas in which we have made the greatest headway, and which the least? Has the science of corporate upsizing through M&A changed much? I wish I

P. Humphreys et al. (eds.), *Decision Support in Organizational Transformation*

could promise to answer all these questions, but the aspiration of this paper is the more modest one of reviewing a few of the more obvious and salient changes.

First of all, it is appropriate to concede that the largest single change has almost certainly been in the author. In 1967 I had only recently moved from being a doctoral student at Harvard Business School to being an Assistant Professor at Michigan. I was added to the list of authors because John D Glover was far too august a personage to be seen interacting with machinery, while David F Hawkins was far too smart an assistant professor to get involved with doing mathematics and computing when he could hire a doctoral student to do it for him. I have now progressed up the greasy pole of academe to a role faintly analogous to Glover's, though nothing like so august. But I find myself disappointed with our progress. If we were really making a lot of progress, I ought to be just as unable to understand what today's DSS models are doing as Glover was then. But the progress we have made recently has really not been of the transforming kind which was common when the early DSS, primitive though most of them were, came into use.

2 HARDWARE TECHNOLOGY IMPROVEMENTS

The technology, of course, is enormously different. The first few models were written on an IBM 1401, an IBM 7090, and (later) and IBM 360/65. There were no micro-computers available. The nearest thing to a micro was a Digital Equipment Corporation PDP-8, but user access to that was so severely rationed that the project had to be moved back on to the IBM machines to get the paper done on time. Data were loaded by punched cards, as were the programmes, and we were only slowly adding hard disks to the systems to enable data files to be kept on line. These disks were very expensive, and space on them was stringently rationed. The chief bureaucrat of computing at Michigan at the time allocated a lot of space to full professors, a modest amount to associate professors, a tiny amount to assistant professors, and a minuscule amount to doctoral students, even though the actual usage and need was almost exactly the other way round. It took, I think, about five years to get that sorted out. Even in the major companies which eventually picked up the idea of computerised merger and acquisition analysis, the technology was totally mainframe based, and there were tight controls on who was allowed to use the machinery and for what purposes. The idea of using the computer for confidential work, so confidential that the computer technicians and managers were not to be allowed to see any of it, was totally revolutionary, and required the personal intervention of the chairman of the board of directors in at least three of the companies I was working with at that time.

There was virtually no communications capability in 1967. By the time we wrote the second paper, in 1969, the technology had advanced so that we were able to connect to a mainframe through a teleprinter terminal machine, very like the telex machines of that time, using an audio modem and a conventional phone line. I can still recall the exhilarating thrill of life in the fast lane, the first time I was

able to transmit at 4800 baud. A whole corporate data file could be loaded to disk in a mere twenty minutes or so.

The improvements in the hardware side of the technology are clear and unequivocal.

3 SOFTWARE TECHNOLOGY IMPROVEMENTS

On the software front, too, the technology has undoubtedly moved, though it is not quite so obvious that the movement has been forwards. Most of the early programmes were written in FORTRAN 2, then FORTRAN 4. By 1969 we were working under timesharing and using, for the most part, Dartmouth Basic Language. It has become fashionable now to regard these as dinosaurs, and various new devices are offered as the modern way to go about the task of writing a programme. Structured programming and object orientated programming, C, C+, C++, C+++ and the rest are all touted as improvements. I am afraid that they simply are not. They do the same things as the old languages, and the student DSS submissions that have come to me over the thirty year period are still characterised by the same kinds of mistakes in 1996 as I was getting in 1966. I do not teach programming, but rely on the students having taken a course from one of the specialists. We really have made very little progress on this front of general high-level languages:- all we have achieved is diversity.

I will readily admit that the introduction of spreadsheets, starting with Visicalc in 1977 and moving forward to Lotus and Excel now are very important and useful innovations. For certain kinds of DSS, the spreadsheet approach is a real and important advantage which was not available in the early years. I will further concede that the automatic macro facility which is available in some software packages is a substantial benefit in the right hands. This facility enables a spreadsheet user to initiate a sequence of calculations by pressing the keys in the right order, and having these recorded for later automatic use. When you examine the results of this process, former users of Dartmouth Basic have absolutely no trouble in reading it. The Microsoft Visual Basic is so like the old Dartmouth Basic that I have to hope they are paying adequate royalties for it.

I am, therefore, willing to concede that some modest progress has been made on the software side of technology in the context of corporate upsizing DSS applications. Most of the changes that have taken place are in graphics, which is almost totally useless for the kinds of work which merger analysis involves.

4 DATA SERVICES

The most complete change that has occurred in the field of corporate upsizing DSS and M&A in general is in the availability of computerised data sets. In 1966, useful card services were available, giving financial and other history for every

company on the New York, American, London, and Frankfurt exchanges. I am reasonably confident that similar services were available for the other exchanges too. The developer of an M&A DSS had all the data he could possibly wish for. The nature and form of it, however, left a lot to be desired. The data had to be transcribed, reformatted, and stored in a specially designed file that the M&A analysis programme could be programmed to read. This was a very tiresome business. For most M&A work, it was necessary for something like eighty or ninety numbers to be copied across for each company that was being worked on. In a typical situation, while the search for merger partners was proceeding, there would be twenty or thirty companies. Some of these data were relatively stable, changing only once a quarter or even once a year. Others, however, especially share price data, had to be changed daily. Because of the extremely confidential nature of the work, it was not possible to delegate this tedious data transcription to a secretary, who would certainly have done the job better and more efficiently than I did.

It was therefore a great and welcome relief when computerised data files with download facilities came on the market. Compustat, Datastream, Microexstat, and other services enabled the data to be fed directly from the supplier's files into a spreadsheet, where they could be rearranged for later loading into the merger model.

It is perhaps a bit ironic that the same flexibility and ease of use of the data files from the service agencies had the secondary effect of eliminating some of the competitive advantage which DSSs for M&A had previously provided. With the arrival of the datafile and the transfer programmes, every public company could easily obtain the services of a DSS. All the investment banks and merchant banks had at least one such model in operation by 1980, and the competitive advantage battlefield shifted away from <u>having</u> a DSS for merger analysis to having <u>the best</u> DSS for merger analysis. This, of course, was less easy for the client companies to differentiate. A good merger analysis system and a mediocre merger analysis system look pretty similar until you dig into the works.

The availability of computerised data sets is, perhaps, the most significant of all the changes that have occurred in corporate upsizing DSS in the thirty years.

5 RELATIVE ABSENCE OF CHANGES IN THE ECONOMIC MODELS OF THE MERGER

I will discuss the content of the typical merger model in a later section, but first it is necessary to consider what changes have taken place in this part of the process. I should preface this section of the paper with the caution that many of the investment and merchant banks regard their M&A DSS as a major competitive advantage, and I have therefore only direct access to a small proportion of the total. In some instances, it has been possible to see the results of another M&A DSS because it is being used by the other side in a negotiation, and it is therefore sometimes possible to infer what the model was doing. At the same time, it would

be as well to recognise that this is an anecdotal report on the changes, not a comprehensive survey.

The basic changes that I have seen in the M&A DSS have been remarkably few. There have been certain specific changes, such as the automatic importation of data, and sometimes the graphical presentation of the consequences of the merger. The fundamentals of the analysis has hardly changed at all in the thirty years. The basic reasons for merging have not changed, of course, so I suppose I should not be surprised that the economic analysis has stayed the same and therefore that the DSS is still much the same.

The changes that have taken place are more to do with the instrument used to pay for the acquisition. In 1967, there was a strong fashion for mergers to be financed by convertible preference shares. By the mid-1980s, there was a fashion for using high-yielding fixed interest non-investment grade securities, which was the official name for junk bonds. In the 1990s, the relatively low levels of interest rates has made it sensible to think in terms of a cash merger. During this time period, there have also been changes in the laws governing mergers and acquisitions, and changes in the regulations issued by the stock exchanges. While some of these changes have caused quite a fuss when they were happening, it must really be admitted that the market for control of corporations is pretty much the same as it has always been. A few things have become taxable that were not before, and a few things that were taxable have ceased to be taxable. That can certainly change the decision as to whether a merger makes sense or not, but the economic model used to study the situation is essentially unaltered.

The changes to the economic models used to study the feasibility of merger proposals have been relatively modest, and are mainly matters of presentation or of incorporating changes to the tax laws or the stock exchange rules, all of which have been minor.

6 THE GENERAL NATURE OF THE M&A DECISION: [A] OBJECTIVES

The main objective which the companies taking part in a merger or acquisition are seeking to fulfil is to make their shareholders richer and to make the managers richer by giving them a bigger empire. A secondary objective, held by the smaller companies, may be to arrange to be taken over because the family which owns it has nobody in the new generation who can carry on the managerial task. In the case of a hostile bid, the objective of the managers of the target company is to avoid being taken over, usually because they will probably be fired the day after the acquisition is consummated.

Studies of the success and failure of mergers have been somewhat negative about the whole process. Generally, when a merger or acquisition takes place, the shareholders of the company which is purchased do rather well, and the managers of the acquirer do well (because they have a bigger empire and that usually brings

more pay), while the managers of the acquired company usually get kicked out. The history is a bit mixed as to whether the shareholders of the acquirer do well or badly. This depends on many factors, one of which is whether the acquiring managers pay too much for the company being acquired, and this particular topic is therefore of great interest, and is the principal focus of most of the M&A DSS models.

Michael Jensen of Harvard has estimated the gains to US shareholders of companies which have been taken over. These average out at over forty billion dollars a year for the dodecade ending 1988. The gains to the shareholders of the buying companies has averaged four billion. These large sums could be compared with the dividends paid to the entire US shareholding public during this same twelve year time period, which amount to about $86 billions annually.

The financial objective of the merger is usually to enhance the earnings per share of the parent company by buying an earnings stream (which was formerly the smaller company's) and issuing shares for it. If you issue few enough shares, the total earnings of the combine divided by the new total number of shares will be a higher number than the result you had before, dividing the parents earnings by the previous total number of shares. In order to get away with this manoeuvre, you have to have previously arranged that your share price is rather high, so that the shareholders of the smaller company are willing to accept a smallish number of them in exchange for their company. This action on their part may not be a dim as it sounds. The alternatives available to the shareholders of the small company, other than selling out to a big one, may be relatively few. This is often the only way the shareholders can get rid of a group of useless managers, who happen to have a sizeable shareholding.

At the same time, it is true that earnings growth is a principal reason for mergers to happen. It is often the case that the large company can put more funds behind a good idea than the smaller company, and this may enable it to take a leading position in a new market than the small company could ever achieve on its own. Jensen thinks that growth is a bad reason for mergers, but his examples are all related to very big firms, to which this important reason does not apply.

There is near unanimity now that the idea of diversification as a reason for merging is bad. Sam Hayes is especially forthright in his criticism of the merger wave of the 1960's in which companies bought other companies because they were different from anything else the large company did. This diversification was supposed to enable the good times in one industry to offset any bad times in another, and a general improvement in overall results was supposed to follow. This did not work. The senior bosses did not understand all the companies for which they were responsible, made very bad decisions, and became vulnerable to break-up bids in the next merger wave of the 1980s.

There are many other objectives which managers can seek to fulfil by means of a merger. A full discussion can be found in any of the text books on the topic, such as Brealey, Myers and Marcus. For the moment, it is enough to note that

earnings growth is one major goal, that diversification is definitely out of fashion, and that capital gains to the shareholder groups are very effective instruments for implementation.

7 THE NATURE OF THE M&A DECISION:- [B]IMPLEMENTATION AND ANALYSIS

Although the objectives are numerous, they are at least fairly clear. When it comes to the task of making the merger work, the situation is very much less clear, and the results have been quite poor, by almost any definition of good and poor that one cares to select.

In the first place, there is the inadequacy of the analysis of the way in which the merged enterprises were going to be managed after the merger. In Emmons and Perry's paper, reporting a roundtable discussion in 1997 of this general area, specialists from all subject areas complained about the amateurish ways in which some very important issues had been handled. They quote KH Wruck as being concerned about acquirers imposing a bureaucratic system on a freeform enterprise, and then wondering why it was no longer creative. They quote L Paine's concern about the mismatch of personnel policies, especially when a thuggish business managed purely for shareholder value takes over another which had emphasised employee development. RL Nolan was worried about the failure to think through the coalescence of the various corporate information and computing networks, while Michael Beer was even more worried about the failure to cope with the need for some kind of joint strategic understanding, even if it was one which was much more heavily influenced by the parent than by the new subsidiary. Please note that these deficiencies were being reported in 1997 as current problems, not as historic issues which are now behind us.

They certainly are not new ideas. The principal arguments were set forth at length through the analysis of a survey in Kitching's paper of 1967, entitled "Why Do Mergers Miscarry?". Having surveyed twenty-five large acquirers, some of whom had made a dozen purchases, he was able to report that "concentric marketing" mergers were failing disproportionately often, and his definition of that phrase makes it clear that the problems lay in the organisational and interpersonal concerns addressed by Wruck and Paine 30 years on. Kitching also identified the need for a manager of change to take a clear and cohesive managerial line in directing the total business, after listening to both teams. This has much in common with Beer's comment about the early need for a joint strategic document. It would appear that we are making quite a few of the same errors now as we were then.

It must be acknowledged that the merger wave of the 1980s was largely a successful one, in bringing concentration and focus to the task of large company management. Most of the 1990s mergers which are proving successful are building

on this strong foundation. Usually, they are devoted to the fulfilment of a strategic goal, which cannot be handled easily by organic growth methods.

8 THE FINANCIAL MODELS

We shall return to the topic of implementation when we consider the way forward for DSS in Mergers. First, it is necessary to consider what the more financially orientated DSS models were and are doing, before we look at the problem of what these models' successors should be doing in the future.

As was suggested above, the original models (some of which are still in use) were designed to ensure financial viability. The assumption was made that the more sociological and strategic issues would be dealt with by other means. It was not seen as the financial modeler's job to address these issues.

The models were designed to work out what a fair price for a given subsidiary would be, and what form that payment ought to take. The usual route was to decide how much the parent company wanted to pay as a premium over the present market price of the shares, and then to try a variety of packages that could achieve that. The packages would range from 100% cash to 100% shares, with, possibly, a number of variants in the form of convertible preferred shares, or bonds, or preference shares. The selection of the particular package would be a matter for the preferences of the shareholders of the company being acquired, some of whom might be very cash hungry (and willing to pay the taxes now) while others were content to accept paper in exchange (and postpone the taxes for a future period).

In the model below, the exchange that is being explored is an exchange of shares only, where the larger firm "Parent" is seeking to buy the smaller firm "Small" by issuing Parent shares in exchange for the shares of the small company.

	Parent	Small
Number of shares	8000	2000
Share Price	16	16
Earnings total	5000	1850
Growth expected	8	4
Dividend/share	4	1

In the above example, Parent might offer to buy Small by offering six Parent shares for every five Small shares. If this were the offer, and it were to be accepted, the situation could be shown to be as follows

	Before Merger	After Merger
Parent Earnings per share	0.625	0.659 *
Small Earnings per Small share	0.925	0.79 **
Small Dividend/share	0.01	0.05
Capital owned by Small	16	19.2
Dividend, Parent	.04	0.042

* ((5000+1850)/(8000+(6/5)(2000)))
** 0.659 * 6/5

In this situation, the Parent has increased its earnings per share, and slightly increased its dividend by means of the merger. The shareholders of Small have made a capital gain of 20% from 16 to 19.2, and have increased their dividend income by 400% from a penny to five pence. They have given up some earnings per share (down 14.6%) in order to obtain these two benefits. Both companies were very stingy indeed in terms of dividends. The shareholders of Small may, however, have been glad to escape from the very confining Small dividend situation to the still confining but at least larger Parent.

It is not appropriate in this paper to go into the intricacies of merger and acquisition models in any detail. In every case that I have seen, the mission is to work out the financial consequences of the merger proposal. The decision to offer six for five, in the above example, would be arrived at by the parent managers using their M&A DSS, and would be evaluated on receipt by the Small managers using theirs. The models would be calibrated to deal with taxation, with dividends, with capital values, with growth rates, and with the more complex kinds of merger. These will be mergers in which the instruments on offer are not just shares, but might include cash, preference shares, junk bonds, or all four of these.

The underlying equations in use in merger models which I have seen used recently are really very similar to the ones which were in use thirty years ago. They have had to be somewhat more sophisticated because of the changes in the legal system governing M&A, but the basic task remains essentially the same.

9 THE SITUATION NOW FOR DSS IN M&A

Have we really made a lot of progress? In a sense, of course, the answer has to be yes. There are very few mergers nowadays in which a DSS is not employed to work out the terms and conditions under which the merger will be agreed. We are using much fancier hardware. We have access to infinitely more convenient

databases. We have made some slight progress in terms of the development of our software tools.

In another sense, however, the answer could be "not much". The actual models we are using are the same as the primitive ones of thirty years ago, with various legally required adjustments. Also, since everyone is using the DSS approach, there is less competitive advantage to be gained from the use of them. The costs of developing and updating these DSS models is very considerable however, and the firms that have them feel they must spend to keep themselves in a state of at least competitive equality, if they cannot attain competitive advantage.

We could perhaps compare the use of DSS in M&A to the use of ATMs in the banking industry. For a few years, the banks that had ATMs gained a competitive advantage from having them. Nowadays, almost all banks have them, and the banks that do not have them are suffering a severe competitive disadvantage from their absence. But all the banks are incurring very large costs to keep their ATMs up to date.

It could be argued that decision support systems for corporate upsizing through merger and acquisition have suffered the fate of so many bright ideas of bygone times. Perhaps they have become a commodity?

10 A POSSIBLE WAY FORWARD

As a professional in the DSS area, I find the thought of being a commodity rather too depressing. I am confident that there are many things we can still do within the field of M&A to make sure that the DSS concept continues to be of service. Not just a commodity service, either, but a differentiating service which makes a real economic and social difference to the M&A problems which businesses confront. What, then, might such a differentiating service look like? I take it as given that we will continue to produce financial and quantitative DSS models of the kind discussed earlier.

The clue to our next move lies in the critical comments which were listed in the middle part of the paper. The mergers are still failing, either absolutely or compared to what had been hoped. The reasons they are failing are known, and have been known for years. The organisational styles are not only different but seriously incompatible. The information systems and computer systems are not only different but seriously incompatible. The policy of the businesses are seriously different, with one emphasising people, a second emphasising shareholder value, a third emphasising product quality and a fourth emphasising cohesion of distribution channels.

There are no databases that deal with these issues. There are anecdotes and a number of studies of corporate style. There is no real "cookbook" with instruction for the novice to follow so that he can get the merger to come out the way he wanted it to be. We may have reduced the financial aspects to a formula or a near-

formula, but on organisational, systems, and orientation issues, we are still in the jungle.

That must be the area where we will make our big contribution. If the job was easy, nobody would pay us much to do it. We need to devise databases, questionnaires, and other data devices to allow the classification of enterprises, in terms of organisational style, information systems approach, and policy emphasis. A few of these datasets, or at least the components from which to build them, already exist. We need to glean the academic fields to find the change management routes that work when various kinds of incompatible entity are being brought together. Is there, we must ask, a subtle way of managing this aggregation of firms, or is brute force the only hope? And having asked the question, we need to equip ourselves with a bundle of at least historical answers, and ideally theory-founded ones as well.

Then we need to package these histories into case studies which are rich in detail and description, and use some kind of text analysis process to isolate the similarities and differences between them. From there we can move to a comparison between them and the particular pair of companies we are trying to assist now. Some of this material exists already, but it will need substantial expansion and significant reorientation if it is to be a resource for the next generation of DSS for M&A

The major new policy issues for DSS in M&A will lie on the corner, where strategy, behavioural sciences, and information technology meet. The way forward in DSS for M&A may well turn out to be even more fun than it was way back in '66.

11 REFERENCES

Brealey, R.A., Myers, S.C. and Marcus, A.J. (1995) Fundamentals of Corporate Finance. McGraw Hill, New York.

Emmons, G. and Perry, N.O. (June 1997) Blockbuster Deals:- M&As Make a Comeback. *Harvard Business School Bulletin*, , Boston, Mass. p52-59.

Glover, J.D., Hawkins, D.F. and McCosh, A.M. (Summer 1967) Computers in Merger Analysis. *Mergers and Acquisitions* **2,** 17-32.

Hawkins, D.F., McCosh, A.M. and Lampe, J.C. (1969) Time Shared Merger Analysis. *Mergers and Acquisitions*, **4,** 11-19.

Hayes, S. (1997) Blockbuster Deals Make a Comeback. *Harvard Business School Bulletin*

Jensen, M.C. (1996) Mergers and Acquisitions, in *Corporate Finance* (eds. Ross, Westerfield, and Jaffe) 4th edition, Irwin, Chicago.

Kitching, J. (1967) Why do Mergers Miscarry? *Harvard Business Review* Boston Mass, p84-101.

12 BIOGRAPHY

Andrew McCosh has been a member of IFIP since 1984. He was professor of management accounting at Manchester Business School from 1971-1985, and Dean of the Faculty for part of that time. He was professor of finance at the University of Edinburgh from 1986-1995, and Head of Business Finance, Accountancy and Economics for part of that time. He has published forty papers and seven books on systems and on finance.