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Turbulence in Business Networks

A Longitudinal Study of Mergers, Acquisitions and Bankruptcies
Involving Swedish IT-companies

Peter Dahlin

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*Turbulence in Business Networks – A Longitudinal Study of Mergers, Acquisitions
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Preface

The research presented in this doctoral dissertation partly emanates from the work reported in a preceding licentiate thesis¹, in which the many mergers, acquisitions and bankruptcies among Swedish IT-companies were identified as an interesting situation that provides an opportunity to study business network change. The structural view of business networks that was pursued has influenced the approach to business network change suggested in this dissertation, and the data structuration technique that was developed in the licentiate thesis to enable a study of business network change has been another point of departure. Whereas the design of the technique was quite far progressed when it was presented in 2005, more data had to be collected and the possibilities for analysis were yet to be explored. Finding a way to analyse the structured data as business network change has thus been a major challenge for the work during the last couple of years.

In a way, the aim of this dissertation was an underlying, but unspoken, ambition also in the work resulting in the licentiate thesis. Through the continued efforts of bringing order to data and transforming it to present an interesting description of mergers, acquisitions and bankruptcies as the dynamics behind business network change, this dissertation has now realized a large part of what was not achievable when the licentiate thesis was written. As this, in some parts, is a continuation of the earlier efforts, there are some things in common between the two theses, but this doctoral dissertation has a different focus, and a different aim, than the licentiate thesis. Except for some modified sections describing the data structuration technique, this dissertation is an independent original work, and reading the licentiate thesis should only be necessary if a greater understanding of the background of the research and the early stages of the development of the data structuration technique is required.

Altogether, I have really enjoyed my time as a doctoral student, and although the result of my work now is condensed in this written piece, the writing is a minor part of the work. The real accomplishment of these years is the personal growth and the development of a systematic, theoretical and scientific thinking, which hopefully is reflected in this dissertation. As an illustration, the eight chapters in this dissertation contains about 594 000 'written' characters, which is a small set of information compared to the news items that have been manually read through and coded, which together consist of about 7 142 000 'read' characters, and the data set obtained after the structuration and refinement, which amounts to about 5 878 000 'structured' characters. The work with this study has also included efforts of software development, as for example a user interface and functions for analysis and exports have been developed. If also including the programming in this comparison, the mabIT software is based on not less than 298 000 'programmed'

¹ Dahlin, P. (2005). *Structural Change of Business Networks - Developing a Structuration Technique*. Licentiate thesis No. 49, School of Business, Mälardalen University, Västerås, Sweden.

characters of code. The large variety of tasks in the work towards this dissertation has been very stimulating; reading, thinking, reasoning, designing, analyzing, programming and writing - and then redoing it all.

During the years, a number of people have providing me with valuable comments and support, which have given me opportunities to develop my thinking and reasoning further, and they are all much appreciated. The largest contribution has doubtlessly been from my supervisors: Virpi Havila at Uppsala University and Peter Thilenius at Mälardalen University. Virpi, I am extremely grateful for your support and endless commitment. Your carefulness and high requirements have meant a lot to the stringency and clarity of the resulting work. Peter, I really appreciate your wisdom and thoughtfulness. I have really learnt a lot from the discussions with you; no one can make me as puzzled as you can. The exhaustingly intense project meetings during these years have been an important contribution to my confusion, from which this work has emerged. I am also grateful for the various trips we have made and all the fun we have had, such as the wild snowball-fight in the middle of the night at Kolswa herrgård. Thank you both for including me in the research project, introducing me to the research community and contributing to the development of my thinking by constantly making me re-search my research.

I am of great gratitude to Aino Halinen for the excellent review of the manuscript; your comments and encouragement really helped me to improve and finish my work. I am also grateful for the review and suggestions that Pontus Strimling kindly provided concerning the mathematical parts. At an earlier stage, Asta Salmi was an esteemed opponent at the defence of the licentiate thesis, and Anna Bengtsson was a great help to get that work finished. I truly value the help and encouragement from all of you! However, despite all the support and excellent comments, this dissertation is a result of my capabilities and inabilities, so the remaining shortcomings are mine to bear.

Some people at the School of Business at Mälardalen University have been extremely important during the years. Peter Ekman's energy and enthusiasm has been a valuable factor reminding me of the good things in life, the support and concern from Cecilia Erixon has been crucial during the tough times and has made the good times even better, and all the crazy projects together with Cecilia Thilenius Lindh have resulted in many enjoyable moments. Furthermore, Lotta, Tobias, Ingemar, Lennart H, Claes, Per N, Lina, Carl and Lennart Y have been great sources of inspiration and joy, the people in the administration have meritoriously taken care of practical things, librarian Pernilla Andersson has promptly helped with literature requests, and my corridor neighbours during the last year, especially Per J, has kindly put up with the beating music from my room while I was in the intense stage of writing. Thank you all for making these years a wonderful time!

I have also had the opportunity to be part of the Swedish Research School of Management and IT, which has offered valuable opportunities to meet fellow doctoral students as well as senior researchers from different universities and, not least, different fields of research. The research school has developed into something really valuable and I have come to appreciate it more and more for each year. Outside the research school, shared research interests have led to good cooperation and promising initiatives with Christina Öberg and Johan Holtström. In the same domain, Helén Andersson has showed a sincere interest in my work and progress; I really appreciate your encouragement, the relevant questions you have asked and the challenges you have given me.

I am also very grateful to the Swedish Research Council (Vetenskapsrådet), which has been the primary financier of my work, but also to the School of Business at Mälardalen University and the Swedish Research School of Management and IT for supplementary funding. I really appreciate getting the opportunity to do this!

Of tremendous importance is also my family. Thank you all for giving me opportunities to take a break from my work now and then! My family and friends have seen less and less of me because of the focus on finishing this work. I hope we can get a chance to spend more time together now that it is completed. Finally, Magdalena, I am immensely grateful for your endless support and faith. It is beyond my comprehension how you have encouraged me so bravely, and at your own expense. I owe you!

Västerås, a late night in November - to the tunes of Bo Kaspers Orkester,

Peter Dahlin

Abstract

The end of the twentieth century, and the beginning of the twenty-first, was a revolving period with many mergers, acquisitions and bankruptcies among Swedish IT-companies. Such events are likely to affect more than just the companies directly involved, i.e. the bankrupt and consolidating parties, and this thesis considers the contextual embeddedness of mergers, acquisitions and bankruptcies by studying them in a business network setting.

The primary aim of this thesis is to further the understanding of business network change and its underlying dynamics. A business network is a conceptual description of the interrelatedness of companies, which makes them problematic to describe and understand. This thesis suggests a force-based approach to business network change, which focuses on the forces underlying the change rather than the actual alterations of the business network. The suggested approach emphasizes the change and enables an exploration and description of business network change based on its underlying forces, linked to form a change sequence. The events that occur and the forces they give rise to can be used to describe the character of such business network change sequences.

To enable a study of a change sequence within the Swedish IT-related business network, this thesis will use a technique designed to gather information about events and parts of the business network structure by systematizing data from news items describing mergers, acquisitions and bankruptcies involving Swedish IT-companies during the years 1994-2003. This data structuration technique enables a longitudinal and retrospective study of a business network change sequence. The analysis indicates a high possibility of inter-linkages between mergers, acquisitions and bankruptcies involving Swedish IT-companies, and describes a business network change sequence with high intensity and wide extension, which is the type of business network change with the highest potential impact, here referred to as 'turbulence in business networks'.

Keywords: business networks, change, dynamics, forces, events, IT, mergers, acquisitions, bankruptcies, turbulence

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Sammanfattning

Bland de svenska IT-företagen var åren kring millennieskiftet en omvälvande tid med en mängd fusioner, förvärv och konkurser, vilket troligen inte bara påverkade de direkt inblandade företagen, utan även omgivande parter, såsom kunder, leverantörer och samarbetspartners. Denna studie beskriver hur olika händelser kan skapa dynamik i affärsnätverk, samt hur sådan dynamik kan beskrivas.

Affärsnätverk är teoretiska beskrivningar av strukturer som bildas genom sammankopplingar av företag genom olika typer av relationer. Eftersom affärsnätverk är abstrakta beskrivningar är de problematiska att hantera och förstå, men denna avhandling redogör för ett sätt att studera och beskriva förändring av affärsnätverk baserat på de fusioner, förvärv och konkurser som sker. Dessa händelser ses som krafter som verkar på affärsnätverket, och flera krafter kan länkas samman genom struktur och tid till att forma en förändringssekvens. Det föreslagna angreppssättet betonar den potentiella förändringen i affärsnätverk, och genom förekomsten av krafter, deras egenskaper samt sammanhanget där de förekommer kan en förändringssekvens utforskas och beskrivas. Baserat på en omfattande systematisk genomgång av dagstidningar och affärspress har en metodik utvecklats för att extrahera och systematisera information och göra den användbar för studiens syfte. Därigenom har information om totalt 1401 fusioner, förvärv och konkurser bland svenska IT-företag under åren 1994-2003 byggts upp och analyserats. Användandet av artikelarkiv har möjliggjort en retrospektiv och longitudinell studie då artiklarna är baserade på samtida uppgifter.

Studien visar möjligheter till en omfattande sammanlänkning av fusioner, förvärv och konkurser genom såväl specifika aktörers upprepade inblandning som länkande relationer, vilket visar på vikten av att studera denna typ av händelser i sammanhang av kringliggande aktörer samt andra händelser. Den studerade förändringssekvensen visar en omfattande men också varierande dynamik, och vid tillämpning av den föreslagna beskrivningsmodellen karaktäriseras förändringssekvensen bland de svenska IT-företagen av en hög intensitet och en hög utbreddhet. Detta är den förändringstyp med högst potentiell effekt, och föreslås benämnas 'turbulens i affärsnätverk'. Avhandlingens resultat är främst teoretiskt i form av en ökad förståelse för affärsnätverksförändring, men också den vidgade vyn på fusioner, förvärv och konkurser samt den utvecklade metodiken utgör viktiga bidrag.

Nyckelord: affärsnätverk, förändring, dynamik, krafter, händelser, IT, fusioner, förvärv, konkurser, turbulens

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Table of Contents

1 Introduction	1
1.1 Turbulence among Swedish IT-Companies	2
1.1.1 A Rise and Fall?	2
1.1.2 A Situation of Change!.....	5
1.2 Changing Business Networks	7
1.2.1 Business Networks.....	7
1.2.2 The Swedish IT-related Business Network	8
1.2.3 Stability and Change of Business Networks	11
1.3 Studying Business Network Change	12
1.4 Focus of the Thesis	13
1.5 Outline of the Thesis.....	15
2 Approaching Business Network Change.....	17
2.1 The Basics of Business Networks	17
2.1.1 Business Relationships	17
2.1.2 Connections between Business Relationships	18
2.1.3 Views on Business Networks	19
2.2 The Business Network as a Set of Parts.....	20
2.3 The Business Network as a Wider Structure	21
2.3.1 The Network in Social Network Analysis.....	22
2.3.2 The Business Network as a Structure	23
2.3.3 This Study's View of Business Networks.....	24
2.4 Business Network Change	26
2.4.1 Emphasizing the Continuous Business Network Structure	26
2.4.2 Emphasizing Change through Dynamics and Forces	27
2.4.3 Suggesting a Force-Based Approach to Business Network Change	30
2.5 Origin of the Forces	33
2.6 Types of Forces	35
2.6.1 The Size and Direction of Forces	35
2.6.2 Adjustive Forces	37
2.6.3 Radical Forces.....	38

2.7 Inertia and Stabilizing Mechanisms.....	39
2.8 Business Network Change Sequence	42
2.8.1 Evolutionary Business Network Change.....	42
2.8.2 Revolutionary Business Network Change	44
2.9 Dimensions Describing Business Network Change	45
2.9.1 The Intensity of Business Network Change	46
2.9.2 The Contextual Extension of Business Network Change.....	49
2.9.3 The Resulting Business Network Change Sequence	53
2.10 Concluding the Suggested Approach	54
3 Mergers, Acquisitions & Bankruptcies as Events & Forces	57
3.1 Events Giving Rise to Forces.....	57
3.1.1 Endogenous Events	58
3.1.2 Exogenous Events	61
3.2 Mergers, Acquisitions and Bankruptcies as Events.....	62
3.2.1 Mergers and Acquisitions.....	62
3.2.2 Bankruptcies.....	64
3.2.3 Mergers, Acquisitions and Bankruptcies as Endogenous Events	64
3.3 Ways to Treat Mergers, Acquisitions and Bankruptcies.....	65
3.3.1 A Process View.....	65
3.3.2 An Occurrence View	69
3.4 Mergers, Acquisitions and Bankruptcies in a Context.....	73
3.4.1 Mergers, Acquisitions and Bankruptcies in Different Contexts.....	73
3.4.2 Applying a Business Network Approach to Mergers and Acquisitions	78
3.4.3 Forces from Mergers, Acquisitions and Bankruptcies.....	81
3.5 Mergers, Acquisitions and Bankruptcies Concluded	84
4 Assessing Business Network Change.....	87
4.1 The Studied Business Network Change.....	87
4.1.1 The Changing Business Network.....	88
4.1.2 Event-centred Network Elements.....	89
4.1.3 A Structure of Inter-linked Network Elements.....	92
4.2 Assessing the Intensity	95
4.2.1 Amount.....	95
4.2.2 Temporal Concentration	96
4.2.3 Radicality.....	98
4.3 Assessing the Contextual Extension	100

4.3.1	Actor Extension: Spread over Individual Actors.....	100
4.3.2	Structural Extension: Spread in Structural Positions.....	102
4.3.3	Product Type Extension: Spread in Actor Categories.....	102
4.4	Concluding Analytical Model	109
5	mabIT - A Data Structuration Technique	113
5.1	Conditions for the Study	113
5.1.1	Inherited Requirements	113
5.1.2	A Longitudinal and Retrospective Ambition.....	115
5.2	Introducing the Data Structuration Technique	117
5.2.1	Methodological Ambition.....	118
5.2.2	The Idea Behind mabIT	119
5.3	Finding Data	121
5.3.1	Using News Items as Data Source	122
5.3.2	Availability and Accessibility	124
5.3.3	The Quality of News Items.....	127
5.4	Reducing Data	130
5.4.1	Specification of News Papers.....	130
5.4.2	Filtering through Search Terms.....	131
5.5	Coding Data	135
5.5.1	Event Variables	135
5.5.2	Actor Variables	137
5.5.3	Relation Variables.....	138
5.5.4	Guided Coding in the mabIT Software - An Example.....	139
5.6	Storing Data	149
5.7	Preparing for Analysis	150
5.7.1	Refining the Data.....	150
5.7.2	Compiling the Data for Analysis and Export	151
5.8	Directed Analysis	152
5.9	Accomplishments of mabIT.....	153
6	Analysis of the Structured Data	157
6.1	Data Set after the Coding Phase.....	157
6.1.1	Missing Event Data.....	158
6.1.2	Missing Actor Data.....	158
6.1.3	Missing Relation Data	159
6.2	Data Set after the Refinement Phase	160

6.2.1	Event Data.....	160
6.2.2	Actor Data.....	162
6.2.3	Relation Data.....	164
6.3	On the Data.....	165
6.3.1	The Representativeness.....	165
6.3.2	The Iterated Data Collection.....	167
6.4	Concluding the General Analysis.....	168
7	Analysis of the Business Network Change Sequence.....	169
7.1	Intensity of the Business Network Change Sequence.....	169
7.1.1	Amount.....	169
7.1.2	Temporal Concentration.....	171
7.1.3	Radicality.....	177
7.1.4	Intensity of the Business Network Change Sequence.....	179
7.1.5	A more Nuanced View of the Intensity Indicators.....	180
7.2	Contextual Extension of the Business Network Change Sequence.....	183
7.2.1	Actor Extension.....	183
7.2.2	Structural Extension.....	188
7.2.3	Product Type Extension.....	191
7.2.4	Contextual Extension of the Business Network Change Sequence.....	195
7.3	Linkages between Event-centred Network Elements.....	196
7.3.1	Inter-linked Network Elements.....	196
7.3.2	Intra-linkage of the Data Set.....	200
7.4	Concluding the Business Network Change Sequence Analysis.....	204
8	Concluding Discussion.....	207
8.1	Types of Business Network Change.....	207
8.1.1	Turbulence in Business Networks.....	209
8.1.2	Four Types of Business Network Change.....	210
8.1.3	The Implications of the Different Types.....	211
8.2	The Force-Based Approach to Business Network Change.....	213
8.2.1	The Captured Type of Change.....	214
8.2.2	Further Development of the Approach.....	215
8.3	The Data Structuration Technique.....	216
8.3.1	Limitations of the Data Structuration Technique.....	218
8.3.2	Future Opportunities for mabIT.....	219
8.4	Mergers, Acquisitions and Bankruptcies as Linked Events.....	220

8.4.1	Furthering the Study.....	221
8.4.2	Actor-Specific Analysis.....	223
8.5	Managerial Importance.....	223
8.6	Concluding the Accomplishments.....	225
	References.....	227

List of Figures

Figure 1.1	Number of IT-companies and employees therein.....	3
Figure 1.2	The Stockholm Stock Exchange General Index.....	4
Figure 1.3	Number of bankrupt IT-companies and employees therein	5
Figure 2.1	Calculation of the resulting force based on concurrent forces	29
Figure 2.2	Forces making up a business network change sequence	31
Figure 2.3	Two distinguished types of forces: Adjustive and Radical	36
Figure 2.4	Visual representation of an adjustive force.....	37
Figure 2.5	Visual representation of a radical force	38
Figure 2.6	Adjustive forces and the resulting evolutionary business network change sequence	43
Figure 2.7	Radical forces and the resulting revolutionary business network change sequence	45
Figure 2.8	The amount indicator of the intensity of business network change.	46
Figure 2.9	The temporal concentration indicator of the intensity of business network change.....	47
Figure 2.10	The radicality indicator of the intensity of business network change....	48
Figure 2.11	Three indicators of the intensity of business network change	48
Figure 2.12	The actor based indicator of the contextual extension of business network change.....	50
Figure 2.13	The structural position indicator of the contextual extension of business network change.....	50
Figure 2.14	The category indicator of the contextual extension of business network change.....	51
Figure 2.15	The business network as the substance of the business network change sequence	52
Figure 2.16	Three indicators of the contextual extension of business network change.....	52
Figure 2.17	The combined character of a business network change sequence.....	53
Figure 3.1	M&A as a Process and Occurrence	65
Figure 3.2	Mergers, acquisitions and bankruptcies in business networks.....	83
Figure 3.3	Categorization of M&A research and this study's relation thereto	85
Figure 4.1	A wider view of an acquisition.....	90
Figure 4.2	Linked network elements within a business network	94
Figure 4.3	Four field matrix describing Temporal Concentration.....	98
Figure 4.4	Indication of the radicality from different types of events	99

Figure 4.5	Product types as a heterogeneity dimension of a business network ...	108
Figure 4.6	Product type heterogeneity shown as layers of actors	108
Figure 4.7	Analytical model of business network change.....	110
Figure 4.8	The dimensions and indicators describing business network change..	112
Figure 5.1	The data structuration technique as an iterative process.....	120
Figure 5.2	The total number of news item in the three selected newspapers	131
Figure 5.3	The number of filtered news items.....	132
Figure 5.4	Filtered news items relative to the total number of news items	133
Figure 5.5	Distribution of news items over the year	133
Figure 5.6	The relevance ratio of Computer Sweden.....	134
Figure 5.7	The first step in the guide to register a new event.....	141
Figure 5.8	The second step in the guide to register a new event	142
Figure 5.9	The third step in the guide to register a new event.....	143
Figure 5.10	The fourth and final step in the guide to registering a new event.....	143
Figure 5.11	The page presenting details of an event	145
Figure 5.12	The page presenting details on an actor.....	146
Figure 5.13	The page handling the relations of an actor	147
Figure 5.14	The page handling the characteristics of an actor	148
Figure 5.15	The opportunities to search for events and actors respectively	149
Figure 6.1	Bankruptcies in government records compared to events in mabIT ...	166
Figure 7.1	Simplified graph of the distribution of forces over time	175
Figure 7.2	Distribution of the events in a radicality scale.....	178
Figure 7.3	Radicality and amount over time	182
Figure 7.4	Structure of the involved actors	189
Figure 7.5	Linking and straggling actors.....	190
Figure 7.6	The distribution of involvements on product types over time.....	193
Figure 7.7	Layout showing involvements between actors from different product type groups.....	194
Figure 7.8	Actors connected through direct involvements in an event.....	197
Figure 7.9	Structure of direct involvements.....	197
Figure 7.10	Star shaped structure of direct involvements	198
Figure 7.11	Structure of actors linked through relations and direct involvements..	200
Figure 8.1	The character of the studied business network change sequence	208
Figure 8.2	Matrix describing four types of business network change.....	210

List of Tables

Table 5.1	Comparison between data collection methods and sources	124
Table 6.1	Overview of the data after the coding phase	158
Table 6.2	Distribution of the events in the different categories	161
Table 6.3	Distribution of the events over time.....	161
Table 6.4	Distribution of the actors in the used product types	162
Table 6.5	Geographical distribution of the actors	163
Table 6.6	Distribution of the relations in different types	164
Table 6.7	The number of relations per actor.....	165
Table 7.1	Reduction of events irrelevant to this study	170
Table 7.2	The distribution of the forces over time.....	173
Table 7.3	Weighted distribution of the types of events	179
Table 7.4	Cross-indicator analysis of temporal concentration and radicality	181
Table 7.5	Reduction of the actors based on involvements in the events	184
Table 7.6	Top 10 involved and acquiring actors	185
Table 7.7	The number of direct and related involvements of the actors	186
Table 7.8	Actor extension for different roles in direct involvements.....	187
Table 7.9	Actor extension for different types of related involvements	187
Table 7.10	Distribution of the actors over the product types.....	192
Table 7.11	Characteristics of aggregated structures	202

1 Introduction

*On those stepping into rivers staying the same
other and other waters flow.*²

Heraclitus (ca. 535–475 BC)

This quote describes rivers as something constantly changing, and in fact, the constant change is what makes it a river and not a lake or a pool of water. In the course of history, the groove in which the water flows guides the constant flow, and over time, the streaming water causes erosion, which gradually alters the course of the river. Thus, history forms the state at any given moment and sets the direction for the nearby future. When describing a river, the width, depth, origin and outflow are certainly interesting, but these do not address this change. Adding a measure of the flow makes the description richer, makes it possible to identify the water as a river and, together with the static measures, gives an understanding of its character.

Taken less literally, another interpretation of the quote above is to say that nothing is constant but change. This thesis is not about rivers, but business networks, which is a way to understand business through the interconnectedness of companies. Applying the philosophy of flux to business networks, it is interesting to consider whether business networks are like rivers, where the constant change is part of its nature, or perhaps more like mountains, whose main characters are their stability and solidity. A mountain is certainly also formed by its history and is not constant, but gradually erupts and sometimes radically cracks apart. However, overall, it is the mainly unchanged character, and slow transformation, that are the main distinction of a mountain.

Whether business networks are like rivers, distinguished by change, or more like mountains, distinguished by stability, is not the primary issue for this thesis, but it is a highly relevant question since general stability is often assumed in business

² The Internet Encyclopedia of Philosophy (<http://www.iep.utm.edu/h/heraclit.htm>) and Stanford Encyclopedia of Philosophy (<http://plato.stanford.edu/entries/heraclitus/#Flu>)
The Diels-Kranz number of the quote is DK22B12

network literature. Nevertheless, describing the character of this change is of utmost importance for the understanding of rivers and mountains, and describing the character of the change of business networks could similarly be relevant for the understanding of business networks. However, due to the diametrically different nature of business networks, as an abstract theoretical construction, from the physically present rivers and mountains, the difficulty of describing the character of business networks is interesting to look into further. Business networks are theoretical descriptions of interlinked exchanges and dependencies among companies, and as such, they are not easily studied. This is, however, the domain of this thesis: describing and understanding business network change.

This doctoral thesis has been preceded by a licentiate thesis (Dahlin, 2005), and the point of departure for this thesis can, to some extent, be derived from the results of the earlier work. This introductory chapter will, with support from those results, introduce a few aspects that together lead to the aim and research questions of this thesis; first is an introduction to a situation containing lots of change.

1.1 Turbulence among Swedish IT-Companies

During the 1990s, and over the turn of the millennium, Swedish companies focusing on information technology (IT) were subject to some dramatic changes. Starting with a large increase in the number of IT-companies due to, among other things, an increased use of IT, this became both an important factor for the companies using IT and a significant part of the economy. Technological advancements and a great interest in investing in IT-companies are two factors that may have contributed to the prosperous growth of IT-companies and the increase in the number of such companies. However, the rise eventually turned to a fall. Or did it?

1.1.1 A Rise and Fall?

Swedish newspapers and the business press give an interesting description of the development of IT-companies. A common perception of this period (the 1990s) in Sweden, is that a large number of companies were founded based on more or less substantial ideas (Lindström, 2000; Pettersson, 2000). Later, many of these ideas were dismissed as unrealistic, and as it turned out, many of the companies based their business on ideas that too few were willing to pay the price for. During this time, many mergers and acquisitions took place (Edenholm, 2001; Lindroth, 2003; Wallström, 1995), and due to difficulties in profitability, bankruptcies among IT-companies were a common topic in the press (e.g. Fahlén, 2001; Lindroth, 2003).

The development of the Swedish IT-sector during the years before and after the turn of the millennium is closely associated with terms like 'bubble', 'boom' and 'crash' in the media (e.g. Computer Sweden, 1999; Dagens Industri, 1998; Dagens Nyheter, 1999; Forsström, 1998; Lindqvist, 2000; Sandén, 1997; Söderström, 2001; Veckans Affärer, 1998a; 1998b) as well as government and commercial reports (e.g.

Finansinspektionen, 2001; Lewis, 2000; Lindroth, 2003; Löfvendahl, 1999; Sandberg & Augustsson, 2002). The headlines that once augmented the IT industry were then proclaiming its death (e.g. Fahlén, 2001; Svenska Dagbladet, 2001) and the “puncture of the IT-bubble” is described as the most spectacular change in the financial market in recent years (Swedish Financial Supervisory Authority, 2001).

By studying government records that hold information about the companies in Sweden, the number of IT-companies was found to increase uninterruptedly throughout the period between 1994-2003 (Dahlin, 2005). Figure 1.1 below is an updated version of that data, and shows this clear rise. This continuous increase in the number of IT-companies raises the question of which aspect of the IT-companies went through a rise and fall; the number of employees in these companies does show some recession after 2001, but is hardly a crash.

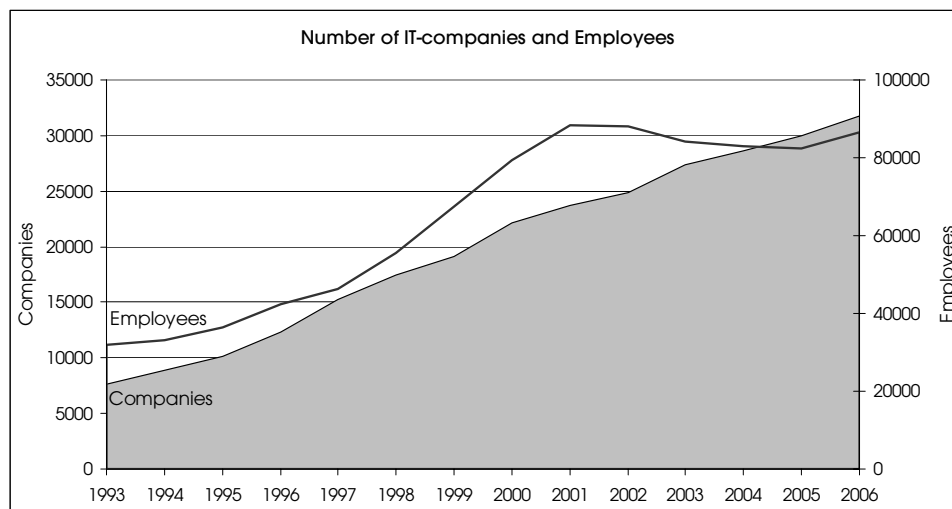


Figure 1.1 Number of IT-companies and employees therein
Defined by the Swedish Standard Industrial Classification (SNI) group 72. Data from Statistics Sweden (www.scb.se).

However, due to a large amount of public interest in the stock market during that time, it is likely that the media reports, largely, reflect what happened on the stock market. Therefore, turning to the stock market valuation, for instance the Stockholm Stock Exchange General Index, shown in Figure 1.2, this reveals some bubble-like development that supports the conception of a sudden rise and just as sudden a fall. After a sharp rise, the stock market peaked on March 6, 2000 (closed at 413.72) and then plunged until October 9, 2002 (closed at 126.41).



Figure 1.2 *The Stockholm Stock Exchange General Index*
 Showing the SX General Index between 1 January 1996 and 1 January 2004. The value was set to 100 at the start of the index, 1 January 1996. Data from Stockholm Stock Exchange (www.omxgroup.com).

So, an increased number of IT-companies indicate that a large number of start-ups took place, but does it mean that the suggested fall never took place, except in the stock market? If it is not visible in the net number of IT-companies, which is a result of the addition and subtraction of companies from one year to another, this decline should be shown in some other form. One must thus look beyond the bare number of IT-companies to understand the suggested change, and this is where bankruptcies, mergers and acquisitions become interesting. Bankruptcies are in a way signs of decline, as they are the result of an unsuccessful development resulting in companies dropping off, whereas mergers and acquisitions are sign of consolidation, which does not have to be associated with decline, but are at least signs of a revolving change. Bankruptcies can be found through the records of the Swedish Companies Registration Office (Bolagsverket), and a compilation of these numbers show a sharp increase in the number of bankruptcies among IT-companies, together with the number of employees in bankrupt companies, starting around the year 2000 (Dahlin, 2005). Figure 1.3 depicts an updated version of that data.

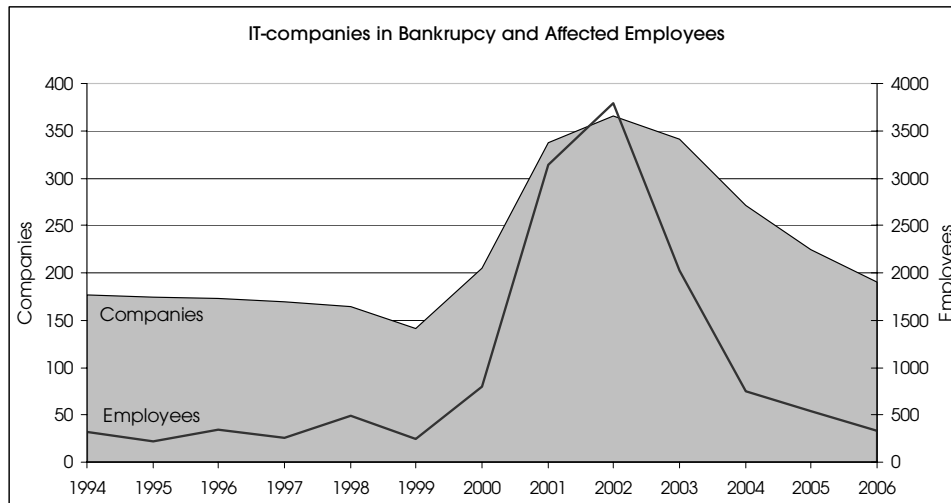


Figure 1.3 Number of bankrupt IT-companies and employees therein
 Defined by the Swedish Standard Industrial Classification (SNI) group 72. Data from Statistics Sweden (www.scb.se).

In this respect, the IT-companies show signs of decline, but as described earlier, the overall development, according to the government records, is a continuous increase rather than a rise and fall. Searching for a bubble gave little result in the bare number of IT-companies, but gives a more fair description when using the bankruptcies of IT-companies. If seen in relation to the number of IT-companies, the share of companies in bankruptcy rather shows a general decrease than an increase over the years, with exception for the peak in 2001-2003. The highest share of bankruptcy is in fact in 1994, when about 2% of the IT-companies went bankrupt. Using the data from the government records can also give other types, and more extensive, descriptions of the number of IT-companies and bankruptcies among them (cf. Dahlin, 2005). However, mergers and acquisitions (M&As) are, unfortunately, not well covered in Swedish directories (Holtström, 2003; Rydén, 1971), although some commercial databases exist. Therefore, getting a description of the occurrence of M&A in Sweden during this period is not as easy as getting data on bankruptcies, and thus, gaining an understanding of the mergers and acquisitions in the turbulent time for Swedish IT-companies thereby remains a challenge. A high frequency of mergers and acquisitions in the end of the 1990s have however been reported from, for example, the United States (Wang, 2007; Weston & Weaver, 2001).

1.1.2 A Situation of Change!

Whether or not there was a fall in the number of the IT-companies depends on which aspect is considered, and as shown, the bare number of IT-companies does not reflect a fall. There has, however, been some revolving changes in the form of

start-ups, bankruptcies, and, if the media stories are to be believed, mergers and acquisitions. The possible rise and fall of the IT-sector is less important to this study, but of greater relevance is the development of the IT-sector during the 1990s and 2000s as a period of change. A situation of this kind, with large amounts of change during a relatively short period, is interesting from many perspectives. From a macro level point of view, it means a revolving transformation of an entire industry, and from the perspective of an individual IT-company, it means being in a situation where many changes occurred and perhaps the company itself was involved in some of these changes. This makes it an interesting situation from an industrial as well as managerial perspective.

The scope of the change, and the conception of it as, for example, ‘the IT-boom’ and ‘the IT-crash’, suggests that it is some kind of coherent phenomenon. This implies that each of the changes, to some extent, is a result of earlier changes, but is also a contributing cause to future changes, and what is behind this assumed coherence is interesting to look into further. Some previous acquisition research has described “merger waves” (e.g. Auster & Sirower, 2002; Broaddus, 1998; Linn & Zhu, 1997; Town, 1992) and “merger movements” (e.g. Hanweck & Shull, 1999; Melicher, 1969; Nelson, 1959; Smythe, 2001; Weston, 1952), which treat mergers and acquisitions as a coherent phenomenon at a macro level by using aggregated industry numbers. M&As are suggested to be a continuous chain of events in the form of variations in the overall number of such events. Although this thesis does not explicitly pursue the merger wave idea, it does see the mergers and acquisitions among IT-companies as a situation of coherent change, but a more nuanced approach would be beneficial for understanding what is behind the coherence. The motives behind mergers and acquisitions can be widely varying (cf. Trautwein, 1990), and a merger or acquisition can also be contextually driven. Öberg and Holtström (2006) have described situations where one merger or acquisition causes other M&As, which can be seen as a kind of ‘contagiousness’. Whereas merger waves concern industry aggregates on a macro level, the suggested contagiousness concerns individual M&As on a micro level. In between these two would be an approach to the possible coherence as a wider trend while still acknowledging internal variations to get a more nuanced picture.

Multiple explanations and multiple perspectives can be used to explain the situation of change, but despite the approach, M&As are consequently not seen as isolated phenomena since they are suggested to affect each other. Another contextual influence is evident when looking at which companies are likely to be affected by a merger or acquisition. Besides the two companies that are directly involved, i.e. merging, acquiring or being acquired, it is reasonable to assume there is an effect on other companies, with which the directly involved companies are doing business, in different ways. This widened way of looking at the effects of a merger or acquisition gives another view of the contextual interdependence. Since actors other than the directly involved IT-companies are likely to be affected by the changes, a perspective that sets the company in the context of other companies

should be interesting to apply to the many mergers, acquisitions and bankruptcies that took place during the turbulent situation among the Swedish IT-companies. In this turbulence, there were many companies acting in various ways. If seeing each company as part of a larger structure, the business firm and its actions should be set in a context of other firms and their actions. Not only is this relevant for recognizing the wider effects of the firm's own actions, but it also acknowledges the individual firm's dependence on the aggregated actions of the company's context.

1.2 Changing Business Networks

A central part of doing business is the interaction with customers and suppliers, through which exchanges of resources take place in order to fulfil the needs of each company. The needed resources are bought from suppliers, and produced products are sold to customers that in turn are in need of such resources. All parties are naturally of great importance in order for this exchange to take place and a company would not be a company without its customers, suppliers and other important actors. Different perspectives can be applied to companies and their contexts (cf. Easton & Håkansson, 1996; Porter, 1980; Richardson, 1972; Swedberg, 1994; Thorelli, 1986). The business network perspective offers a way to describe, analyse and understand business, i.e. companies and their activities, with an emphasis on the interdependence between companies, thereby clearly setting companies and business activities in a context.

1.2.1 Business Networks

The business network perspective described here originates from an interaction approach (cf. Håkansson, 1982) which forms the basis for descriptions of exchange between companies as business relationships (Ford, 1980; Johanson, 1989). The natural initial advances in what has become a theoretical field describing business networks have been in understanding inter-organizational exchange and interaction, thereby describing what has been labelled 'business relationships'. One of the most fundamental assumptions and characteristics of business relationships, according to this theoretical strand, is that they are long-term oriented, highly reciprocal, and built up from mutual adaptation. They are the result of past interaction and constitute the frame for future interaction. In particular the development of business relationships has been addressed in the research, and the change of relationships has been studied as an incremental process mostly dealt with through adaptation within the existing business relationships (e.g. Dwyer, Schurr & Oh, 1987; Håkansson & Snehota, 1995).

A business network is often defined as connected business relationships. Adaptations and interlinked activities, i.e. different kinds of dependence, makes the relationships connected in the meaning that what happens in one relationship affects other relationships (Forsgren & Olsson, 1992; Hallén, Johanson & Seyed-

Mohamed, 1991; Håkansson & Snehota, 1995). If a company adapts its products or procedures to suit one business relationship, it will most likely affect other business relationships in which that company is involved, in either a positive or a negative way. This interdependence between business relationships is of outmost importance, and as most companies have more than one customer or supplier, a typical company is involved in numerous business relationships, all connected to each other. The connectedness of business relationships adds the network dimension to this analytical tool, and the connected relationships form a consistent unity: a business network, which makes the actions of a company dependent on not only the business relationships it is involved in, but also the relationships connected in the second line or even further away (Anderson, Håkansson & Johanson, 1994; Axelsson & Easton, 1992; Håkansson & Snehota, 1989).

Some of the literature on market interaction or business relationships includes the notion of business networks in the sense that the actors and the business relationships are embedded in a network context (e.g. Chetty & Eriksson, 2002). Thus, this equates the business network with a rather limited set of business relationships instead of ascribing a specific meaning to the business network as a structure. Fewer studies take the business network concept further, and the concept is being used in quite different ways. A group of business relationships is not necessarily a business network, as connectedness is a prerequisite for describing a number of business relationships as a business network (Anderson, Håkansson & Johanson, 1994; Blankenburg Holm & Johanson, 1997). Studies with this view of business networks tend to emphasize, and take an interest in, the parts constituting the business network, i.e. the actors, the business relationships and the connections between them. Such studies can, for example, be concerned with how one business relationship affects, or is affected by, other business relationships. It is not the business network at large, but rather the parts of the network, that is of interest in that kind of relational view.

It is, however, also possible to look at business networks as something more than just a set of business relationships. With a focus on the business network as a structure, where the composition is more important than the parts, a 'structural view' can be pursued. Cook (1982, p.177) describes a shift in the focus of social network research; that the advances "have moved exchange analysis from a focus on relatively isolated dyadic exchange relations at the micro-level to a more macro-level consideration of exchange systems where dyadic relations are viewed as components of larger social structures". This should also be interesting from a business network point of view, for example to address wider business networks.

1.2.2 The Swedish IT-related Business Network

As has been indicated, the intention is to apply this business network perspective to the turbulent situation among Swedish IT-companies. The delimitation of business networks is a problematic topic (Johanson, 1989; Prenkert & Hallén, 2006), but instead of going further into that issue, this study will use a pragmatic approach.

Essentially, 'the Swedish IT-related business network' originates from Swedish IT-companies and consists of the business relationships between these companies, which include, for example, customers, suppliers, partners and owners. In addition, these related companies' business relationships, as well as business relationships further away from the IT-companies, are of outmost interest and relevance to the IT-related business network, and the actual delimitation will eventually be an issue for the empirical study. In short, 'the Swedish IT-related business network' refers to the Swedish IT-companies and all companies and business relationships that are of importance to them or their business relationships. This means that a supplier's supplier's supplier, and even companies further away, can be included, as long as they are of importance to a Swedish IT-company or its business relationships. What is described here is thus a business network that is based on IT-companies, but that also includes other companies, which have some kind of effect on the IT-companies and their business.

Starting with the IT-companies, which constitute the basis of this IT-related business network, these can be defined in different ways. To keep this conceptual reasoning separate from methodological considerations, it is not relevant to point out the use of a particular categorization, such as the Swedish Standard Industrial Classification (SNI). Instead, the definition of an IT-company is a company whose products, either services or goods, are largely based on information technology in the form of components or knowledge. IT is a multifaceted and widely used term that can be defined and treated in many different ways (Orlikowski & Iacono, 2001), but for this purpose, it is used to denote "a computing resource (that) is best conceptualized as a particular piece of equipment, application or technique which provides specifiable information processing capabilities" (Kling, 1987, p.311). The IT-companies are thus dealing with some kind of IT in accordance with this rather wide definition, which includes hardware products, software products and various services (Hoch, 1999).

Following the enormous developments in information technology during the last decades, when technology itself has evolved and the use of IT has come to characterize more and more of society and business (Cairncross, 2001; Chandler & Cortada, 2000; Friedman, 2000), promising business has arisen to help companies handle these changes. Not only is IT used in administration and as the backbone of production, but it is also more and more embedded in all type of products, and companies invest a large amount of money in IT (Brynjolfsson & Hitt, 2000). Therefore, besides the IT-companies, the IT-related business network described here includes their customers, i.e. the users of information technology. Business relationships between an IT-supplier and its customer can be characterized by a relatively great dependence due to the complexity of IT. An IT-system might permeate an organization, which makes it greatly dependent on the system and consequently also the supplier of the system. This dependence can be enhanced if the customer lacks the competence to understand its own IT-system, or if the IT-system is largely adapted for the customer, implying requirements of thorough

understanding from the supplier. This suggested character of the IT-related business network, with a high degree of dependence, has some implications for how changes involving the IT-companies might affect the business network. The character of the IT-related business network regarding the business relationships will not be considered further as it would make this thesis too wide. Furthermore, the suppliers, partners and all other actors that are of importance to any of the IT-companies are part of the IT-related business network. Since IT is used in all types of business, these related companies can be any type, and the IT-related business network is thus not limited to include only IT-companies.

Start-ups, bankruptcies, mergers and acquisitions were all mentioned earlier as events making up the situation of change involving Swedish IT-companies. When applying a business network perspective to this situation, these events are likely to cause changes of the business network. A start-up means, from a business network perspective, that a new actor enters the business network as business relationships develop. Developing business relationships is a gradual process (Håkansson & Snehota, 1995), whereas mergers, acquisitions and bankruptcies can be more definite and radical, since positions are changed and established and business relationships are terminated when a company disappears or consolidates (Havila & Salmi, 2002). The gradual change caused by start-ups could thus have less effect on the business network, and will therefore not be considered further as business network change. Bankruptcies, however, are quite evident changes, since all the business relationships of the company are terminated as the company disappears. Mergers and acquisitions can also mean the termination of business relationships, but such a concentration of companies at least implies a structural alteration as two sets of connected relationships are joined when two nodes become one.

A bankruptcy is not primarily a managerial action, and might thus appear to be of less interest to business research than mergers and acquisitions, but also bankruptcies affect more than just the directly involved companies. The surrounding companies, e.g. customers and suppliers, are likely to be affected by these kinds of events, and from that respect, mergers, acquisitions and bankruptcies are of relevance to more companies than just those merging or going bankrupt. The definite ending of a bankrupt company can, consequently, have continued effects on the business network, although the bankrupt company cannot be followed after the event. M&As are, in contrary to bankruptcies, generally managerial actions taken in order to obtain a positive change. Although a positive outcome is not always the case, it is however an event where the business of the involved companies continue in some form, and thus enables studies following the companies over a period of time.

It is, consequently, quite easy to see that the turbulent situation among the Swedish IT-companies, with mergers, acquisitions and bankruptcies, causes change of the IT-related business network. The potential effect from these events on the involved companies' contexts, i.e. the IT-related business network, is especially interesting due to the nature of it, as described earlier. For example, the great dependence a

customer can have on an IT-company that provides an information system permeating the entire company, makes the effect from a merger, acquisition or bankruptcy involving that IT-company even harder to disregard.

1.2.3 Stability and Change of Business Networks

Change is a natural part of business as companies act on perceived opportunities, abandon unprofitable efforts and adapt to changed conditions (Ghauri, Hadjikhani & Johanson, 2005; Penrose, 1959). From a business network perspective, this shows as change in and of the business network, and just as change is a fundamental part of business, it is also a fundamental part of business networks.

Business relationships, which are an important component of business networks, describe long-term directed interactions rather than discrete transactions (Håkansson, 1982). This long-term characteristic of business relationships is considered to make them relatively stable over time (Johanson, 1989; Low, 1996), although mutual adaptations as well as more profound changes do occur. Business networks are thus based on components that are considered stable, but not constant. Consequently, business networks are, somewhat vaguely, by some, described as stable yet constantly changing (e.g. Gadde & Mattsson, 1987). Within business relationship research, changes ranging from mutual incremental adaptation (e.g. Hallén, Johanson & Seyed-Mohamed, 1991; Iacobucci & Hopkins, 1992) to the more radical ending of a business relationship (e.g. Halinen & Tähtinen, 2002; Tähtinen, Blois & Mittilä, 2004; Tähtinen & Halinen, 2002) have been described. Therefore, although developmental change might have received the most attention, there is a span in the coverage of the research on business relationship change.

Changing business networks have received less attention, and there is a need for more studies on this topic (Knoben, Oerlemans & Rutten, 2006). Depending on the approach, change can mean very different things simply because if the focus is on the parts of the business network, the relevant change to study is change of the parts whereas if focus is on the business network as a wider structure, change on a structural level becomes most interesting. With a view of business networks as wider structures, governing mechanisms that work through the business relationships and connections can be introduced (cf. Håkansson & Johanson, 1993; Jones, Hesterly & Borgatti, 1997; Newman, 2003). It is thus not likely that business networks change randomly, but rather within these governing mechanisms, and understanding how business networks change is an important part of understanding business networks in general (Benassi, 1995; Forsgren & Olsson, 1992). Mechanisms and functions, irrespective of the object in which they work, can be hard to identify without change, so from that aspect, change is necessary to enable the understanding of business networks.

The general stability of business relationships and business networks has thus been a prominent assumption in research and literature, whereas business network change has been handled quite vaguely. However, the turbulent situation among Swedish IT-companies calls for attention to studies of wider business network

change and makes it quite evident that also more revolving changes are relevant to include in a business network view. Business network change is here seen to comprise both the alterations of the structure and the underlying dynamics, i.e. what is behind the alterations, and an increased understanding of business network change is believed to increase the overall understanding of business networks. Therefore, it would be interesting to find a way to address, discuss and explain business network change and its underlying dynamics (Mattsson, 1997), and by doing so, a step would be taken towards understanding the mechanisms of business networks and the varying conditions in different business network settings.

1.3 Studying Business Network Change

The turbulent situation among Swedish IT-companies called for further understanding of wider business network change. Learning more about business network change, however, requires more than just a way to theoretically reason on it; it should also be possible to study this empirically. In this section, the turbulent situation among Swedish IT-companies is not only considered a reason, but also an opportunity, to empirically study business network change. However, doing so is not easy. As business networks, and business network change, are conceptual and abstract descriptions, they are quite hard to study. A great challenge is thus, how business network change can be studied empirically, and that issue will be further addressed next.

The view of business networks as wider structures naturally requires a method that is capable of capturing such, relatively wide, business networks. Furthermore, the time aspect is important to consider as the described turbulent situation, and thus the studied business network change, extends over a certain past period. A need for longitudinal studies of business network dynamics has been expressed (Knoben, Oerlemans & Rutten, 2006), but the longitudinal necessity, together with the retrospective intention, yields some problems associated to the lapse of time. The current research method, including data collection, handling and analysis, should therefore be able to cover an extended, past, period of time and, in the extent possible, should the weaknesses associated with retrospective studies be avoided, such as loss of memory or elucidation of past events (Dahlin, Fors & Öberg, 2006).

To perform this kind of study, there is a need for a data source containing information that can be used to study business network change, based on the turbulence among Swedish IT-companies. As noted in section 1.1, the availability of such data sources is limited, and although some records of start-ups, bankruptcies, mergers and acquisitions exist, of varying degree, they comprise little information that can be used to study business networks. In Dahlin (2005), a 'data structuration technique' was developed to enable studies of business network change. The technique aims at collecting pieces of information, which are structured in an analyzable form, and the technique has a preference for a wide coverage of the studied business network rather than a deep understanding of the

parts of it. The data source used in this technique is computer-based archives holding newspaper articles, which enables both a wide coverage and access to information from the time the article was written, which allows the study to extend back in time without having to rely on retrospective information. A systematic use of this kind of data sources can be beneficial for studies of business network dynamics, but does not seem to be very common (Dahlin, Fors & Öberg, 2006). The wide availability is perhaps counteracted by the scarcity of the wanted information, but this data source offers an arms-length distance to the empirical situation, which facilitates a structural view and extensive coverage, and it also avoids getting the auto-consistency that snowball sampling can yield (Salganik & Heckathorn, 2004; Tsvetovat & Carley, 2007).

The described situation of change in the IT-related business network offers an opportunity to study business network change, but the result of such a study is consequently contingent on the approach, both theoretically, analytically and methodologically. When continuing the work reported in Dahlin (2005), the data structuration technique should be adapted to this study's conditions and more data should be added.

1.4 Focus of the Thesis

Together, the three areas presented indicate the topic of this thesis. First, a description of a turbulent situation, where many mergers, acquisitions and bankruptcies took place during a relatively limited period of time, and this revolving period for Swedish IT-companies is interesting to consider as one phenomenon. Although this changing situation was the point of departure for the introductory chapter, it is not the focus of the aim and research questions of this thesis. Instead, the main focus of this thesis is more theoretical. The turbulent situation among Swedish IT-companies raises an interest for change as a coherent phenomenon, and the dynamics behind it, not least concerning changing situations that involve wider sets of companies. The focus of this thesis can thereby be expressed as:

Purpose *The purpose of this thesis is to explore and describe business network change and its underlying dynamics through the occurrence of events.*

The many mergers, acquisitions and bankruptcies involving Swedish IT-companies are not only an excellent relevance indicator for looking further into business network change, but also offer a good opportunity for studying such change, which furthermore calls for the development of a method that enables it to be studied empirically. Hence, the aim of this thesis is to develop an approach to business network change, including a descriptive framework, through theoretical reasoning as well as an explorative application in an empirical study of mergers, acquisitions and bankruptcies involving Swedish IT-companies. To make the aim a bit more

manageable and comprehensible, there are three more specific research questions relating back to the issues presented in this introductory chapter. Following the expressed focus, the first question is:

Q1 *How can business network change be approached and described?*

This research question is largely theoretical and preparatory analytical, but it also heavily relies on the learning from an exploratory application of the approach in an empirical study. It addresses the vague understanding of business network change as a wide, structural phenomenon, and thus aims at developing a way to approach it. The outcome of this research question is in the form of a suggested approach to business network change that offers a way to address, describe, discuss and understand business network change.

Developing this approach includes theoretical reasoning building on existing literature, but it also requires empirical experiences, based on new data. This leads to the second research question:

Q2 *How can business network change be studied empirically?*

Studying business network change empirically faces a number of challenges, and the second research question addresses some methodological issues. The abstract and intangible nature of business networks, not to mention the change thereof, is clearly a difficult prerequisite. Additionally, the desire and ambition to capture a wide structure complicates it further, and so does the longitudinal and retrospective nature of describing past changes. The expected result of this part is a research design and method, concretely enabling an empirical study of business network change. Largely, this means continuing the started development of the so called 'data structuration technique' (Dahlin, 2005). Finally, the third research question has a larger focus on the empirical situation:

Q3 *How can the mergers, acquisitions and bankruptcies involving Swedish IT-companies be described and understood from a business network perspective?*

To some extent, this question concerns adapting and applying the approach to the studied situation by specifying how mergers, acquisitions and bankruptcies can be seen as business network change. However, it also concerns the actual description and understanding of the turbulent situation obtained when applying the developed approach to business network change. The answer to this question is thus twofold, as it both implies an exploratory test of the suggested approach to business network change, which enables further development of it, and a description of the studied mergers, acquisitions and bankruptcies involving Swedish IT-companies as a coherent phenomenon.

1.5 Outline of the Thesis

This first chapter has introduced the topic of the thesis by describing the empirical situation as well as the theoretical domains and the methodological ambitions. The outcome is a specification of an aim and three research questions setting the direction for the thesis. In Chapter 2, there is a focus on the theoretical aspect through the suggestion of an approach to business network change based on earlier literature from business network research and other areas. In Chapter 3 and 4, the suggested approach is adapted and applied to the empirical situation, thereby joining the theoretical and empirical domains. Chapter 5 describes the methodological aspects of the study in the form of the developed data structuration technique. The result of the encounter between the used methodology and the empirical situation is in the focus of Chapter 6, which provides a general description of the obtained data. Chapter 7, on the other hand, applies the suggested model to a part of the data, and is thus the primary analysis section of the study where the mergers, acquisitions and bankruptcies involving Swedish IT-companies are described as business network change. Finally, the concluding chapter, Chapter 8, joins all the parts of the research as the research questions are revisited when the accomplishments and implications of the thesis are discussed.

2 Approaching Business Network Change

This chapter contains three main parts, which aim at making three points clear. Firstly, this chapter offers a description of the basics of business networks along with a description of how this thesis regards business networks, namely as structures. Secondly, change in business networks can be approached in many different ways, and this chapter suggests an approach, which sees business network change as a result of forces acting within the business network. Thirdly, understanding, studying and discussing business network change requires a way to describe it, and proposing dimensions to describe business network change is the last fundamental part of this chapter.

2.1 The Basics of Business Networks

“Networks” are somewhat of an in-thing, and the word is frequently, and perhaps overly, used. Many different topics apply the idea of a network. There are, for example, communication and computer networks (e.g. Forouzan, Fegan & Coombs, 2001), neuron networks (e.g. Balaban, Korshunova & Bravarenko, 2004), social networks (e.g. Barnes, 1954; Scott, 2000; Wellman & Berkowitz, 1988), citation networks (e.g. Leydesdorff, 2007), business networks (e.g. Håkansson & Snehota, 1989; Johanson, 1989) and many other kinds of phenomena described as networks (Buchanan, 2002; Watts, 2004). The different applications of the network idea concerns different phenomenon and thus implies fundamentally different units of analysis, conditions and, not least, different purposes.

The wide applicability and powerful explicability are some of the fundamental strengths of the network approaches (Buchanan, 2002; Watts, 2004), and social network analysis, i.e. the analysis of social phenomena as networks, is by Gartner described as one of the ‘hot technologies’ that will have the greatest impact on businesses over the next 10 years (Gonsalves, 2006). The network idea offers a way to describe complex situations, and when it is applied to companies, it becomes a way of looking at companies and a tool to understand business (Forsgren, Holm & Johanson, 2005). Two of the main components of business networks are business relationships and connections between such relationships and these will be described next.

2.1.1 Business Relationships

A central part of doing business is the interaction with customers and suppliers (Ford, 1990; Håkansson, 1982; Turnbull & Valla, 1986). Through these interactions, there is an exchange of resources to fulfil the needs of each actor. The

resources needed are bought from suppliers, and produced products or services are sold to customers that in turn are in need of such resources. All parties are naturally of great importance for this exchange to exist and the business would not be a business without its customers, suppliers and other important actors.

A business relationship is a description of a long-term interaction between two companies, where both parts are active, and it refers to situations with repeated exchanges rather than discrete transactions (Håkansson, 1982; Johanson, 1989). A business relationship comprises different kinds of exchanges, and the interaction involves many different functions of the companies. The development of business relationships is a mutual process where the involved actors gradually invest resources in the cooperation (Forsgren, Holm & Johanson, 2005; Håkansson & Snehota, 1995). As the interaction proceeds, with ongoing exchanges and adaptations, the business relationship evolves and becomes more than exchanges. Adaptations in, for example, products, production or routine implies commitment to the business relationship, which requires a proper level of trust (Morgan & Hunt, 1994). Furthermore, the actors become dependent on each other, both due to a limited substitutability of the counterpart and to the consequential loss of the idiosyncratic investments (Anderson & Weitz, 1992). Altogether, the atmosphere surrounding the exchanges is a fundamental part of business relationships (Sandström, 1990).

Although business relationships primarily describe the interaction between a buyer and a seller, with products vs. money as the main business exchange, other types of exchanges can also be the foundation of a business relationship. A business relationship can thus consist of actors other than a buyer and a seller. For example, the technological exchange within partnership cooperations, the information exchange between a company and the media, and the regulations imposed by the government can have an affect on the company's business. Also these kinds of interactions, involving non-business actors, can be described as business relationships (cf. Boddewyn, 1988; Hadjikhani, 1998; Hadjikhani & Thilenius, 2005).

2.1.2 Connections between Business Relationships

As most companies have got more than one customer or supplier, a typical company is most likely involved in several business relationships, although they can be of varying strength and importance, and business relationships can best be understood in a context of other business relationships (Forsgren, Holm & Johanson, 2005; Håkansson & Snehota, 1989). Adaptations, interlinked activities, and other aspects creating dependence makes the business relationships connected, in the sense that what happens in one relationship affects other relationships (Forsgren & Olsson, 1992; Hallén, Johanson & Seyed-Mohamed, 1991). If a company adapts its products or procedures to suit one relationship, it will probably affect other relationships involving that company either in a positive or negative way. This interdependence between business relationships is of outmost

importance as it adds the network dimension to this perspective. Together, the connected relationships form a consistent unity, a business network, which makes the actions of a company dependent not only on the business relationships it is involved in, but also the relationships connected in the second line or even further away. (Anderson, Håkansson & Johanson, 1994; Axelsson & Easton, 1992; Håkansson & Snehota, 1989)

The connectedness between business relationships is related to both the exchange and the behaviours following it. The exchange in one business relationship can be contingent on an exchange, or non exchange, in another (Cook & Emerson, 1984), and resources must thus be coordinated between the business relationships. The connections may, however, also be related to other aspects of a business relationship. For example, the level of trust in one business relationship can affect the level of trust in another. One can also imagine cross-dimensional connectedness, such as an effect between the level of commitment in one relationship and the level of trust in another. Connections should be considered changeable over time, and different characteristics of the connections can be described, such as the reciprocity, strength and delay (Dahlin & Thilenius, forthcoming; Forsgren, Holm & Johanson, 2005; Yamagishi, Gillmore & Cook, 1988).

2.1.3 Views on Business Networks

Business relationships, and consequently the connections between them, are theoretical constructs; they are tools to understand business. What has been described is thus *one* way, not *the* way, to look at business relationships. As mentioned, the connectedness between business relationships enables a view where the business relationships are seen as a coherent phenomenon: a business network. A business network is often defined as connected business relationships, but a group of business relationships is not necessarily a business network, as connectedness is a prerequisite for describing a number of business relationships as a business network (Anderson, Håkansson & Johanson, 1994; Blankenburg Holm & Johanson, 1997). Nevertheless, since business networks are made up of theoretically constructed business relationships and connections, business networks can also be seen in very different ways.

The business network approach is merely a description of the structure of interdependences among actors, and there is nothing but the application and definition of the approach that decides what a business network is and what it looks like. The business network approach can be seen as a tool or map, which can be helpful for describing, explaining and understanding business (Forsgren, Holm & Johanson, 2005). However, the business network is a conceptual phenomenon, so we cannot study the *object* 'business network' but only the *concept* 'business network'. This enables the possibility of attributing various meanings to business networks, and the flexibility of the concept has resulted in different interpretations and usage of the business network idea. Even within the definition of business

networks as connected business relationships, different views of the business network are possible (Henders, 1992). In this and the following section, two contrasting views of business networks will be described; a part-focused view where the business network is seen as a context to some business relationship(s) or actor(s), and a structural view where the composition of the connected business relationships is central to the understanding of the business network.

2.2 The Business Network as a Set of Parts

The part-focused view evidently emphasizes and takes an interest in the parts constituting the business network, i.e. the actors, the business relationships and the connections between them. A business network study with this view is concerned with how one business relationship affects, or is affected by, other business relationships. There is certainly much to explore about business relationships, but one business relationship does not form a business network. What constitutes how these part-focused studies describe business networks is that the studied business relationships are considered to be embedded in a network context, although the network dimension is not developed more thoroughly (e.g. Chetty & Eriksson, 2002; Hedaa, 1993). 'Embeddedness' acknowledges a wider dimension of economic actions by seeing them as being embedded in structures of social relations (Granovetter, 1985). This notion is reflected in the opinion that an individual business relationship only can be understood when considering the other business relationships, with which it is connected (Forsgren, Holm & Johanson, 2005; Håkansson & Snehota, 1989). In such studies, the focus is thus clearly on the business relationship, as what is to be understood. The surrounding business network is however considered very important for the studied part. This approach can be used on a variety of levels, with different parts in focus. For example, Halinen and Törnroos (1998) describe three levels: actor-network embeddedness, dyad-network embeddedness and micronet-macronet embeddedness. Although different 'objects' are made central, they all have a clear part-focus even though the micronet-macronet perspective moves towards treating a business network as a structure.

With an emphasis on the actors, business relationships and connections within the business network, the point of departure lies in the parts of the network. Some specific actor or business relationships can be of interest for some reason, for example interesting technology (e.g. Anderson, Håkansson & Johanson, 1994; Waluszewski, 1990), changes of the actor (e.g. Bångens & Araujo, 2002) or perhaps specific characteristics of the business relationship. Studying the embeddedness of the focal part is, thereby, a matter of identifying the business network surrounding this central business relationship or actor. Through this approach, the business network becomes the context in which the particular actor or business relationship acts (Snehota, 1990). Network context has been discussed in previous research as the connected business relationships that an actor considers relevant, and is more or less directly affected by (Blankenburg Holm, 1996a; Grabher, 1993; Håkansson

& Snehota, 1989; Snehota, 1990). The limited number of business relationships that are of great importance to the actor or its business relationships are what make up the business network context (Thilenius, 1997), which thus per definition implies that there is a centre.

Regarding business networks as the context of a particular actor or business relationship clearly shows the strengths of the part-focused view. Management, from a specific firm's perspective, is probably best understood by setting the firm as the central point in the study since considering the business network to be the context of the firm is quite natural from an individual firm's point of view. This is just one example of the suitability of the part-focused view when the main interest is in the parts, whether it is a specific actor, business relationship or perhaps a smaller set of business relationships, for instance a triad (cf. Havila, 1996; Havila, Johanson & Thilenius, 2004). The part-focused view of business networks has natural advantages for understanding parts of the business network. It is, for good reasons, not the business network at large that is of interest, but rather the parts of the network. The weaker business network level of this view justifies describing at least some of the part-focused studies to deal with "sets of connected relationships" rather than business networks (cf. Anderson, Håkansson & Johanson, 1994, p.1). The next section will describe how to put more focus on the business network level.

2.3 The Business Network as a Wider Structure

The basic idea of business networks is that business is best understood as a coherent phenomenon. This coherence is what the business network approach is all about as it sees a network-like structure of business exchanges. Treating business networks as contexts to certain actors or business relationships does, however, not capture the business network as a wider structure. The business network is often vaguely treated and the functions and characters of business networks are not nearly as investigated as those of business relationships. Therefore, a more strict business network level of both theoretical reasoning and empirical studies, in combination with looking at wider structures, should enable more focused look at business networks.

Cook (1982, p.177) describes a shift in the focus of social network research, that the advances "have moved exchange analysis from a focus on relatively isolated dyadic exchange relations at the micro-level to a more macro-level consideration of exchange systems where dyadic relations are viewed as components of larger social structures". This is also interesting from a business network point of view, as an alternative way of addressing business networks is to focus on the structural aspects of business networks rather than the constituent parts. The business network is, thereby, seen as a structure with certain characteristics and functions.

The term 'business network structure' might seem tautological, but such a connotation emphasizes that business networks are seen as structures rather than

sets of components. This view is more of a holistic approach to business networks and deals with network-wide issues (cf. Gadde & Håkansson, 1992). Such a view of business networks is based on the same assumptions as part focused business network studies, i.e. reciprocal long-term business relationships and connections between the business relationships, but the difference lies in how the business network is approached. The following sections will describe how business networks can be seen and treated as wider structures, which enables an increased focus on the characteristics of business networks. This is done both by briefly looking into the social network domain, and by reflecting on how similar approaches have been used in earlier business network research.

2.3.1 The Network in Social Network Analysis

Social network analysis (SNA), as an application of diktyology, is based on the observed interconnectedness of social actors and entities, and it particularly looks at the structural arrangement of the actors and relations (Freeman, 2000a; Parkhe, Wasserman & Ralston, 2006). It is a field with quite a history and has found many different areas of application (cf. Barnes, 1954; Freeman, 2000a; 2004; Laumann, 2006; Scott, 2000). It has a tradition primarily based on sociology, but the network way of thinking has been applied in many different areas, for example genealogy, chemistry, scholarly publication and citation, economics, business cooperation, as it can handle any kind of situation that can be described as a network (Breiger, 2003; Buchanan, 2002; Laumann, 2006).

Newman (2003) describes the simplest form of network as a set of vertices joined by edges, but also notes that there are many more complex forms of networks. The fundamental parts in network analysis are actors (or vertices) and relations (or edges), but Wasserman and Faust (1994) also mentions ties, dyads, triads, subgroups, groups and network as fundamental concepts, although these concepts are not treated equally within the literature (Parkhe, Wasserman & Ralston, 2006). Instead of emphasizing the characteristics of individual actors and relationships as determinants of the studied phenomenon, social network analysis is based on the conviction that the individual actor best can be understood as being part of a structure. So, what network theory does is to shift the focus from the parts, and the attributes of the parts, to relations between them and the structure they form (Parkhe, Wasserman & Ralston, 2006; Wellman, 1988).

So, primarily, the network is a structure, and as such it has been described in many ways (cf. Wasserman & Faust, 1994). Examples of characters of social network structures are size (Anderson, Butts & Carley, 1999), density (Breiger, 2003; Scott, 2000), structural holes (Burt, 1992), subgroups and clusters (Wasserman & Faust, 1994). Such measures can be used separately, but get more interesting when they are combined, for example as ‘small world networks’, which have a low degree of separation but a high degree of clusteredness (Buchanan, 2002; Uzzi & Spiro, 2005; Watts, 2004; Watts & Strogatz, 1998). This way of treating the network allows the

possibility of considering different functions of networks (Newman, 2003), which will be returned to later in this chapter.

Social network analysis also takes an interest in structural properties of the individual actors. The measures used are often relative to the delimited network, which advocates treating the network as an entity. Examples of structural characteristics of individual actors are centrality (Freeman, 1979; Marsden, 2002), positions and roles (Wasserman & Faust, 1994) and the description of certain actors as gatekeepers (Freeman, 1980), whereas regarding the relations and their strength has been a topic in some literature (e.g. Granovetter, 1973; Granovetter, 1982; Krackhardt, 1992; Nelson, 1989). Methods and measures for structural network analysis are available in a large variety (Carrington, Scott & Wasserman, 2005; Wasserman & Faust, 1994) and although manual analysis is possible (e.g. Bjerstedt, 1963) a wide variety of computer software is also available (de Nooy, Mrvar & Batagelj, 2005; Huisman & van Duijn, 2005), facilitating both the analysis and visualization (Freeman, 2000b; Lüdemann et al., 2004). It is thus relatively easy to perform calculations on a large network, which in fact may risk under-emphasizing the understanding of the components of the network (Parkhe, Wasserman & Ralston, 2006).

The approach pursued in social network analysis is thus good at handling networks, and treating them as structures, but the measures and methods from SNA cannot be fully applied to business networks. Who the actors are, the possibility for relationships to exist and the delimitation of the network are some aspects which have to be handled with caution (Dahlin, 2007a; 2007b). With individuals as the actors, and friendship relationships, the possible network structure is fundamentally different from when the actors are heterogeneous companies and the relationships are based on the relevance for business exchanges to take place. Combining the business network approach with SNA could be useful as, for example, the clarity of the basic components could be borrowed from the business network approach whereas SNA could provide a structural view and the focus on characters of the network, but such a combination must be undertaken with great caution.

2.3.2 The Business Network as a Structure

Some research on business networks takes a kind of holistic approach to business networks, dealing with network-wide issues and addresses structural aspects of networks, although the meaning of 'structure' is often not defined. Håkansson and Johanson (1993) describe the structure of the industrial network as constituted by the "patterns and character of the connections between the relations" (p.42), and further claim that the network structure is formed and modified through the interaction within the structure. Håkansson and Snehota (1995) regard business relationships as part of a broader network structure, and later claim that business relationships are elements making up the network structure, which is similar to Forsgren, Holm and Johanson's (2005) definition of the business network as a structure of connected business relationships. Easton (1992), on the other hand,

focuses more on the actors, stating that the structure “is based upon firms as the elements of structure” (p.17). Structural aspects of business networks in some literature are, however, mentioned without any specific explanation, and are sometimes almost synonymous with ‘business network’ (e.g. Benassi, 1995; Halinen & Törnroos, 1998).

Seeing business networks as structures suggests a focus on the business network rather than the parts, but the primary interest of these studies is often something other than furthering the business network idea. Describing the evolution of a business network surrounding technological development is one example of what such studies may be directed at (e.g. Lundgren, 1995; Waluszewski, 1990). Concerning the effects of a business relationship dissolution, Alajoutsijärvi, Möller and Tähtinen (2000) claim that a ‘tightly structured’ network enables a beautiful exit, but what makes a business network tightly structured is, however, not specified.

Among the examples of studies with a clearer focus on the business network are some that concern the change in positions, for example Andersson and Mölleryd’s (1999) study of changing patterns of connectedness during variations in demand and conditions in a business network of telecommunication actors, and Henders’ (1992) study that describes variations in the positions of actors in a newsprint network. With the concept of ‘power balancing’, Forsgren and Olsson (1992) studied change of the interdependencies in a business network during a period of change which started with an acquisition. Another example is the use of the ‘structuring’ of a business network to label the formation of the network (Uusitalo & Möller, 1997). Also business networks can be ascribed different structural characteristics, such as the density and size of the network (Coviello, 2005) as well as the power distribution (Forsgren & Olsson, 1992).

2.3.3 This Study’s View of Business Networks

This study’s approach ascribes greater value to the business network concept and sees it as something wider than just a narrow context to an actor or business relationship. A contextual view is useful for understanding business relationships, as business relationships can best be understood in the context of other business relationships (Håkansson & Snehota, 1989; 1995), but the connectedness extends beyond the immediate context. Thus, as the aim of this study is to further the understanding of business networks rather than business relationships, it is reasonable to regard them as structures that are wider than merely a context to an actor or business relationship.

This study’s pursued view of business networks sees the business network as a larger structure rather than directing the interest to the components of a business network, i.e. the actors, business relationships and connections. The connectedness between the business relationships does not stop a few steps out from a focal business relationship, although the business network beyond the immediate context may well be of less (perceived) importance to the focal unit. It is therefore

reasonable to regard business networks as wider structures, and by treating the business network as a structure, properties, mechanisms and functions of the business network as a 'whole' can be addressed. Furthermore, and this will be returned to in the next section, the overall development of the business network can be studied.

Referring to a business network as a structure, as if it is an entity, implies that the business network in some way is delimited, not that it is an observable object physically separated from other objects (cf. Penrose, 1959, p.10 regarding a 'firm'). Boundary specification of networks is a complex issue (Knoke & Kuklinski, 1982; Wasserman & Faust, 1994). Although the limits of a business network will always be arbitrary, it is necessary to delimit the network in some way, to make it possible to study (Johanson, 1989). This raises the question of the meaning of "a business network" and "business networks". It is possible that all companies can be included in the same structure of business relationships, which supports the denotation "the business network" and renders "a business network" and "business networks" meaningless. However, including all companies in the world in the same structure makes it very hard to study and even discuss, so it can be assumed that some boundaries are always applied (Easton, 1992). Consequently, "a business network" is equivalent to "a delimited business network", which is a part of the worldwide business network, and "business networks" are thus several delimited business networks. From this it is also evident that the boundaries are analytical, not actual, and there is something beyond the boundaries of the studied business network. Halinen and Törnroos' (1998) micronet-macronet embeddedness illustrates this quite well. A micronet is "a distinct business activity involving several identifiable business actors, e.g. a triad", and the micronet is "embedded in larger network structures" (p.193).

When the focus is not on a specific actor or relationship, but on a wider setting, a structural network focus is required. Covielli (2005) refers to a 'structurally' hard network dimension in opposition to an 'interactionally' soft dimension, and the gained understanding of the larger picture probably means sacrificing a deep understanding of the details. The origin in the exchanges, and the interaction between companies, has influenced the business network field to have a strong focus on the parts, i.e. the business relationships, and they are truly important for understanding the foundations of the business network idea. But the structural view can treat the business network as a 'black box' or focus on the arrangement and composition of the network, although it is still based on the same assumptions as the part-focused business network view, i.e. reciprocal long-term business relationships and connections between these.

The vague treatment of business networks as structures in the business network literature makes it suitable to be open to influence from the field of social network analysis. SNA offers the approach, tools and methods to treat the network as a structure, and integrating network theory with perspectives in management research could be rewarding according to Parkhe, Wasserman & Ralston (2006). So,

whereas the business network approach has a relatively clear understanding of the basic components of what is seen as a network of companies, network theory and social network analysis is good at understanding and studying social phenomena as network structures. The view of business networks used in this thesis has its basis in the, predominantly European, business network tradition but is slightly inspired in the way of thinking of networks by the social network analysis tradition. This combination is believed to have potential to take the business network idea further. In short, business networks are, in this thesis, seen as structures that are wider than merely the context of a certain actor or business relationship. To achieve this, the focus must shift from the components of business networks to structural aspects.

2.4 Business Network Change

Change is a natural part of business networks (Håkansson & Snehota, 1995) and following the research questions of this thesis, it is a central part of this work. Depending on the view of business networks, change is apprehended differently, and following the described dichotomy of how business networks can be viewed, studying change of business networks can be done with an origin either in the parts of the business network, or in the business network as a wider structure.

After determining this thesis' structural view of business networks, this section continues by describing how to approach business network change from that perspective. This means that the rich literature on business relationship dynamics, including for example changed content (e.g. Lindh, 2006), initiation and development (e.g. Batonda & Perry, 2003; Ford, 1980; Wilson & Möller, 1995) and dissolution (e.g. Giller & Matear, 2001; Halinen & Tähtinen, 2002; Tähtinen & Halinen, 2002), will not be relevant to the current study. Before getting to the used approach to business network change in this study, the varying emphasis on stability and change will be considered.

2.4.1 Emphasizing the Continuous Business Network Structure

Roughly categorized, studying change of business networks can either be made from an origin in the alterations of the business network or from an origin in the changes. It might seem natural to approach business network change by studying a business network and look at how it changes, and this is also an approach that is quite often used. The change of the studied network can either be described as a process, where the business network is studied over a period of time, or by studying it at different stages, thus comparing states to capture the change (cf. Halinen, Salmi & Havila, 1999 Fig. 1 & 2; Johanson, 2001). Such studies thus originate in the studied business network and, depending on the method, somehow learn about the changes either explicitly or through analysis of differences.

These kinds of business network change approaches allows great richness in the details captured, and can be concerned with, for example, the cause, process or effect of the changes. They offer the opportunity of including characteristics of the

actors and relationship, as well as looking at how change propagates from one business relationship to another (Hertz, 1998; Håkansson & Snehota, 1995), but such issues are not in line with the structural view of business networks. The processual and state-comparing approaches to business network change can, however, concern aspects such as the power distribution in the business network (e.g. Forsgren & Olsson, 1992) or the technological development within a business network (e.g. Lundgren, 1995; Waluszewski, 1990). They are certainly interesting and powerful approaches, but they also have some shortcomings, which might have come to limit the advancement of business network studies. What tend to dominate in these kinds of studies are the parts of the business network that remain intact, since the actors and relations that do not change are included throughout the entire study. This naturally sets the focus on the ongoing business network structure, i.e. the lasting relationships and actors, rather than the changes. The result could be that the stability of business networks, and the limited degree of change, is overemphasized; when looking for stability, stability is what will be found. This is to some extent a methodological issue, but it also has major conceptual implications.

Business networks are often considered long-term oriented and quite stable (Ford, 1980; Low, 1996). However, even though the longevity creates a notion of stability, business relationships continuously change in content and strength, and some are even established or dissolved (Håkansson & Snehota, 1995). There is a continuity of change, and the business networks, as an aggregate of the business relationship changes, are consequently subject to continuous change. The long-term orientation and stabilizing mechanisms, in combination with the constant adjustments and pursuit of business opportunities, makes business networks stable yet continuously changing (Gadde & Håkansson, 1992; Gadde & Mattsson, 1987; Håkansson & Snehota, 1995). In order to perceive a change, something else should be stable, so change in one dimension requires stability in some other dimension, which is one explanation for the coexistence of stability and change (Håkansson & Snehota, 1995; Kjellberg & Andersson, 2005). The meaning of “stability” is thus not that the business network does not change (Freytag & Ritter, 2005; Gadde & Håkansson, 1992), or is in a state of equilibrium, which for several reasons is an incongruous state for business networks (Håkansson & Snehota, 1995), but rather that the change is within the ‘normal’ scope of the business network.

The literature on business networks has generally been shaped by a preference for stability, although continuous change is admitted, and business network change has been handled quite vaguely. It is likely that a larger focus on the changes could further the understanding of how business networks change and how such change appears.

2.4.2 Emphasizing Change through Dynamics and Forces

It might seem natural to approach business network change by looking at how a studied business network changes, but with this study’s strong interest in the

dynamics of business networks, a stronger focus on the changes is warranted. This study does not set out to disprove the notion of general stability of business networks, but it does have a desire to gain a better understanding of business network change. So, for that reason, this study pursues a more change-focused approach. Through this, business network change can be studied more closely which, potentially, contributes to the understanding of business network in general. The study reported in this thesis will, consequently, not look for a business network and try to capture its changes, but rather look for changes and describe business network change from that angle. The first step is, however, to have a way to approach change, and the remains of this chapter will be devoted to suggesting such an approach.

Sometimes, change of business networks is referred to as business network dynamics. Taking this literally, the etymology points to the basic Greek element 'dynamo', meaning power or force, and 'dynamics' can generally be defined as "that branch of any science in which force or forces are considered", although being most frequent in physics (Oxford English Dictionary). In the construction of this suggested approach to business network change, earlier research on business networks will be used, but one source of inspiration is also fundamental physics. A physicist's definition of dynamics can be "the relationship between the motion of a body and the causes for this motion" (Alonso & Finn, 1967, p.152). The interaction between an object and its context can be described as 'forces', and forces are consequently central to the understanding of the physical world, and not least how objects move and behave. A force (F) can be defined as "the rate of change of the momentum of a particle due to its interactions with other particles" (Alonso & Finn, 1967, p.161) and is often measured in Newton (N). If not going deep into defining forces, it is enough to think of them as pushes or pulls that affect a particular object, and such influences can be relevant to consider in order to understand both static and motion.

Just as there are forces involved when a hammer hits a nail or a horse pulls a cart, a book lying on a table exposes the table to a force corresponding to the mass of the book and Earth's gravity ($F = mg$) whereas the table responds with a counteracting force of the same size, or else the book would fall. An object can be subject to a number of forces at the same time, and whether an object moves or remains static is thus a matter of the joined effects of the forces that acts on it. It is important to note that a force is a vector quantity, which means that it has both a direction and magnitude (hence correctly denoted \vec{F}) and thus obeys the rules of vector algebra (Alonso & Finn, 1967; Weidner & Sells, 1975). The joint effect of several forces must therefore take both the size and direction of the forces into consideration. Newton's second law states that if several forces are concurrent, i.e. applied at the same point, their resultant is the directed sum of the vectors (Weidner & Sells, 1975), whereas they otherwise give rise to a torque (Alonso & Finn, 1967). An example of a situation with a composition of concurrent forces is shown in Figure 2.1.

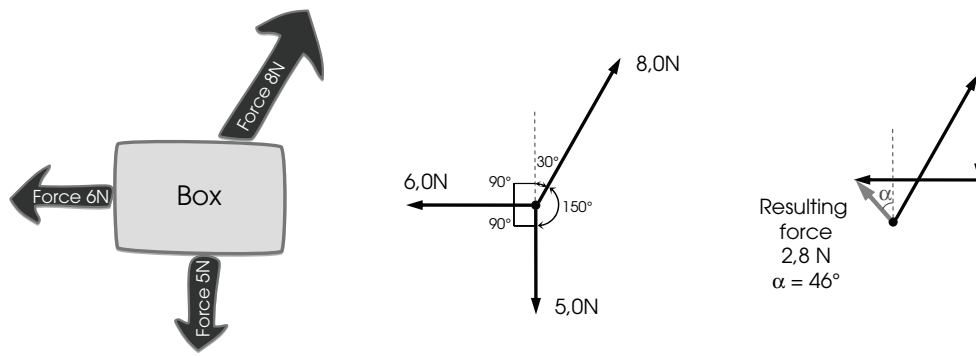


Figure 2.1 Calculation of the resulting force based on concurrent forces

Starting from the left, a box is viewed from above. Three strings, represented by arrows, are attached to the box, and as these strings are pulled, forces are applied to the box. The size of each force is noted in the arrows, and as this example will not consider torque, the box is seen as one point on which all of the forces are assumed to act. To make the example simple, it will neither consider the friction between the box and the surface it rests on. In the middle part of the picture, the forces are shown as arrows extending out from the common point (representing the box), which is a way to identify the interaction between the forces. The length of the arrows represents the size of the force, and the angles are also fairly accurately represented. In the right part of the picture, the forces are graphically added up, starting from the small circle at the bottom, following the 8N-force at an angle of 30° , then turning 150° to the 5N-force and finally turning another 90° to end with the 6N-force. The distance from the original circle to the end of this last force makes up the resultant force, shown as a grey arrow, which in this case is 2.8N at $\alpha \approx 46^\circ$. Mathematically the addition of concurrent vectors is simply $\vec{R} = \sum \vec{F}_i$ or, in an XY-plane:

$$R_x = \sum F_{ix} = \sum (F_i \cos \alpha_i) \quad \text{and} \quad R_y = \sum F_{iy} = \sum (F_i \sin \alpha_i)$$

giving
$$R = \sqrt{R_x^2 + R_y^2} \quad \text{and} \quad \alpha = \tan^{-1} \left(\frac{R_x}{R_y} \right)$$

The mathematical formula handles an undefined number of forces (i), and is a rather simple way of adding up many inter- and counteracting forces, acting on the same object. An object that over time is subject to a number of forces, i.e. they are not contemporary, is likely to show a number of moves during that time, but the resulting trajectory will still be a directed addition of the individual forces. In the example above, the three forces were applied to the box at the same time, resulting in a joint force of 2.8N at an angle of -46° to the y-axis. If the three forces instead

were applied one at a time, the box would first be subject to the 8N-force and would thus move at 30°. Then, as the 5N-force occurred, the box would instead move at 180° from the y-axis. Finally, the 6N-force would push the box at -90° making the box move to the same location, which the joint 2.8N-force would in the contemporary situation.

So, also complex situations involving many forces and incorporating the passing of time can make use of the calculation of resultants through vector algebra. The many forces thus causes many individual changes, some interacting and some counteracting each other, and the overall trajectory can be seen as a sequence of the individual changes. The trajectory's overall character will consequently be a result of all the involved forces. This reasoning will now be applied to business network dynamics, not literally measuring forces in Newton and degrees, but as a way to regard the joint effect of forces affecting an object.

2.4.3 Suggesting a Force-Based Approach to Business Network Change

Following the idea of individual changes, or forces, together forming a sequence (cf. Hertz, 1998), one approach to business network change could be through an explicit focus on forces. The concept 'forces' is used with various meaning in business research. One example is Michael Porter's well known model describing "five forces" through which industries can be analysed (Porter, 1979; 1998b). However, forces have also been described within the business network field. Håkansson and Snehota (1995) claim that "forces that generate change in business networks can be identified" (p.270), and different kinds of forces in business networks are described in some literature (e.g. Gadde & Håkansson, 1992; Halinen, Salmi & Havila, 1999; Keep, Hollander & Dickinson, 1998), but what is meant and what the forces do is quite vaguely described. Håkansson and Henders (1995), on the other hand, make a more thorough use of the forces, or 'change vectors' as they also denote them, to describe business network dynamics. Their reasoning is based on the idea that "intersecting vectors are together shaping the trajectory of the network" (p.146). Business network change is thus seen as a result of the forces that act on the business network, which is quite similar to the calculation of a resultant force from the component forces in physics.

This thesis will, inspired by existing literature on business network dynamics and the fundamental understanding of forces from physics, suggest an approach to business network change. Discussing forces in relation to business networks should not be taken literally in a physical sense. It does not mean that the business network is pushed or pulled, or that it can move right or left. Instead, it should be seen as a non-physical explanation of change, just as business networks are non-physical to their nature. With this suggested force-based approach, business network change is described through the forces that occur within the studied business network, which is delimited by some criteria, and the forces together makes up the change of that business network as time passes, in the form of a sequence. Figure 2.2 illustrates this and should be studied carefully, as variations of

the figure will occur repeatedly throughout this chapter. Through this approach, focus can be set on the changes, in line with the aim of this study, and it should be noted that it is not the actual alterations of the business network that are studied, but the forces that underlies the change. This thesis will thus combine and continue earlier literature's suggested understandings of business network change, but also find inspiration in fundamental physics, and suggest a way to describe the morphology of business networks through the forces occurring within them.

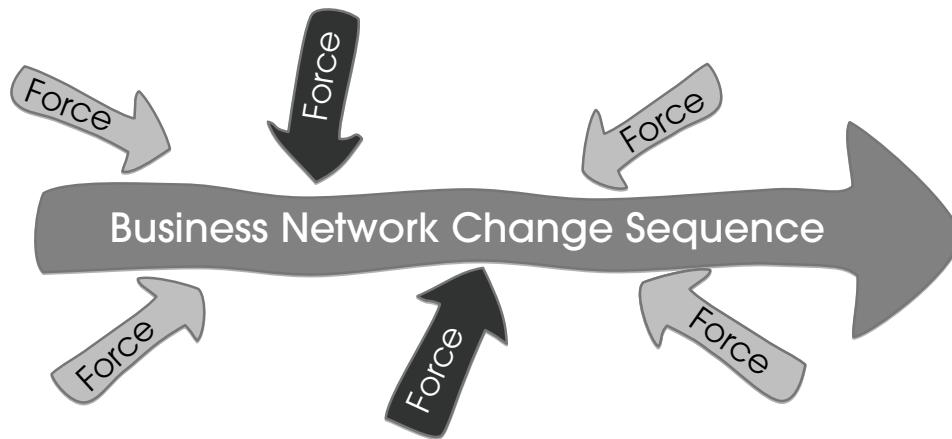


Figure 2.2 Forces making up a business network change sequence
The overall business network change sequence as a result of inter- and counteracting forces.

The most central part of this suggested approach is that all the inter- and counteracting forces which affect the business network together make up the overall change and development of the business network in the form of a business network change sequence. However, there are a number of interesting aspects within this suggested force-based approach to business network change, and while the business network change sequence is the central topic in this thesis, some aspects preceding and building up this sequence are relevant to consider. The remaining sections in this chapter will therefore be devoted to describing the suggested approach to business network change in more detail, based on a few specific aspects.

Firstly, the forces do not occur out of nowhere, so a natural aspect to start with is the **origin of the forces**. The source of the forces can certainly vary, and so can the intentionality of them, but the simple division made at this stage is between forces that originate from within the studied business network and forces that originate from outside the business network. This thesis makes this distinction since the effect of changes in the environment may be quite different from the effect of actions taken by an actor in the business network. Although the origin of the forces is not the central point of this thesis, and is not explicitly shown in the figure

above, it is an important part of the force-based approach to business network change.

So, different sources can give rise to the forces, which are illustrated by the six labelled arrows in Figure 2.2. Irrespective of the source, a force is a force because of its potential impact on the business network, and depending on what is behind a force in combination with the impact of it, the characters of the force can vary, described here as different **types of forces**. Whereas some forces are likely to cause minor change, others may have major effects. For example, the forces originating from the merger of two companies will most likely have a greater effect than the forces from a minor internal reorganization of a company, and the imposition of a high customs duty can cause different forces than a minor variation in the currency exchange rate. The different types of forces are in the figure illustrated as arrows of different appearance, and are, as mentioned, not only dependent on the origin of the force, but also the actual effect of the force, all dependent on the situation and how the change is received. A force could, for example, cause effects varying from adaptations within a business relationship to the ending of a business relationship.

Therefore, the effect of a force is important to consider, not least since forces are defined based on their potential impact on the business network in which they occur. However, the forces are not unimpeded in their effect on the business network. Some might be moderated, and some might even be neutralized and made ineffective, through the existing structure's resistance to reformation, created by commitments within the existing business relationships, which stabilizes the business network. This can be described as **inertia and stabilizing mechanisms** of business networks, and has the effect that not all forces actually reach through, and change the business network. Of the forces shown in the illustration, all might thus not actually affect the business network, as the stabilizing mechanisms may interfere and render some ineffective.

The forces that do affect the business network are seen to inter- and counter-act each other and together form a **business network change sequence**. This is shown as the large horizontal arrow in Figure 2.2, which can be seen as a "trace" or "trajectory" of the business network as it over time is being impacted by the different forces. The resulting sequence is thus an aggregate of the forces occurring within a business network and the joint effects of the forces are used to represent the business network change. Being what forms the change sequence, the forces that do have an effect on the business network are decisive for the character of the overall change of the business network. Consequently, **dimensions describing business network change** can be based on an aggregation of the character of the forces and their contexts, whereby the reasoning moves from individual forces to a business network level. This is the focus of the thesis and the dimensions through which the resulting business network change sequence can be described will be given much attention in this thesis.

The mentioned aspects gives a logic of reasoning as follows: different types of forces, with different origins, that occur within a business network together form a business network change sequence after an intervening moderation by stabilizing mechanisms, and the character of such a business network change sequence can be described through the occurring forces. This means that the business network, just as business relationships, is a result of its history, which in the words of Snehota (1990, p.132) is expressed as: “its pattern is the product of history, of past experience of market actors both individual and collective.” With this view, business network change is a sequence of forces transforming and reproducing the business network, and such forces occur continuously (Håkansson & Snehota, 1995). The business network is however not only the result of previous actions, interactions and changes, but it also constitutes the basis for future development and makes some directions more likely than others (Håkansson & Snehota, 1995).

The wanted focus on the changes is achieved by seeing business network change as a sequence of all the forces acting within it. However, whereas some other approaches to business network change are less inclined to capture change, and tending towards emphasizing the stability of business networks, this force-based approach is very apt to capture changes, but misses many of the stable parts. This overrepresentation of change, perhaps resulting in a biased picture of business networks, can be necessary in order to make the changes appear, and to make business network change easier to study.

Some literature within the business network domain, which has some resemblance to this suggested force-based approach, is worth mentioning. Concerning the development of business relationships, interaction episodes are considered central (Schurr, 2007). In a multi-level model of business relationships, developed by Holmlund (1997; 2004), several interconnected actions, which is the lowest level, forms episodes. In turn, these interrelated episodes form sequences, defined by, for example, a time-period or a project, which at a higher level forms relationships. The concept of ‘sequences’ in terms of defining several actions, episodes, changes, forces, or whatever sub-unit that is used, is indeed quite similar to the business network change sequence formed by the forces in the suggested force-based approach. These are however on a relationship level, but another example from the literature, that shows similarities to the suggested approach, is Blankenburg Holm’s (1996b) network approach to foreign market entry. She sees the entry process as a result of actions taken by various actors, driven by external and internal entry forces, which she shows in a picture with great resemblances to Figure 2.2.

2.5 Origin of the Forces

According to physics, an object is affected by a force when its momentum changes, i.e. it departs from the present velocity and direction (Weidner & Sells, 1975). Expressed in a simple way, it can be described as a push or pull (Alonso & Finn, 1967), which thus indicates that it is likely that there is another object which exerts

the push or pull. It is easy to give examples of forces: e.g. muscular forces competing in a tug-of-war, the accelerating force from a car engine, the force in a collision between two cars, and the force of a magnet holding a postcard on the refrigerator door. Despite the variety of these examples, they are all versions of four basic forces. Two of the forces, called the strong and weak force, operate within atomic nuclei, and are thus normally not perceivable. The other two, electromagnetism and gravity, on the other hand account for almost all perceivable forces. (Weidner & Sells, 1975)

These four types of physical forces are discussed at different levels, i.e. concerning different particles, ranging from quarks to atoms, and they all originate from within the respective particle. However, if disregarding these fundamental forces and instead going back to the everyday examples the origin of forces can be described in relation to the studied object. For example, think of a car. If the car and its components are the studied object, we can assume that pushing down the accelerator pedal causes an increased generation of power in the engine, which will probably cause acceleration. The acceleration, created by its engine, can clearly be seen as an *endogenous* force, i.e. it originates from within the car itself. In terms of a collision, where another car collides with the focused car, this would be an example of an *exogenous* force affecting the car. These simple examples set the focus on two important aspects of the origin of forces, namely what causes the forces, and from where they originate. Due to the theoretical focus of this chapter, the first aspect is not essential here, but will instead be returned to in the next chapter. For this theoretical reasoning, it is enough to assume that there is some kind of ‘event’ behind each force.

Concerning the second aspect, Gersick (1991) points out two basic sources of change: internal or environmental. This is quite similar to another dichotomy, labelling the sources endogenous and exogenous, where exogenous means a response to environmental change (e.g. Harrison & Easton, 2002), and endogenous implies an origin in actions by actors within the business network (Low, 1997). Some claim that organizations and their environment are inseparable (Chaffee, 1985), which largely questions this division between endogenous and exogenous origins of forces. Such a division will, however, be used here to make the concept of forces more nuanced. Naturally, the division between endogenous and exogenous forces completely depends on where the dividing border is set. Returning to the example of an accelerating car; the increased throttle, and the resulting power increase from the engine, is considered endogenous if the entire car is the focal object, but exogenous if the car is seen as a set of parts and, for example, the chassis of the car is the focal point. When applying this reasoning to business network change, the studied business network is the natural focus and it is the sources of the forces that are addressed through the dichotomy endogenous-exogenous. It means, quite simply, that endogenous forces thus originate from within the studied business network, e.g. from actions taken by actors within the

business network, whereas exogenous forces originate from outside the studied business network, e.g. macro-level factors.

2.6 Types of Forces

So, forces are theoretical concepts representing occurrences of potential impacts on the studied business network, and although the idea of using the force-based approach in this study is to get to the overall business network change, this section will deal with the forces as separate, or at least not necessarily connected, occurrences. The current passage will deal with the different characteristics of individual forces whereas the next section describes different characters of business network change sequences, and thereby handles the forces as a collective phenomenon.

It is important to note that a force is not equal to its effect. Behind each force is some kind of action (Håkansson & Henders, 1995), and the radicality of the force is dependent on the likely effect of the action. This section will start by describing a rough dichotomization of forces based on the (likely) appearance from a structural point of view. The actual change is thus the effect of a force, and it varies not only with the force *per se*, but also what the force impacts. Similar forces can thus yield diametrically opposed effects depending on the business network structure on which the force acts, and the kind of forces that are likely to occur and have an effect consequently varies accordingly.

2.6.1 The Size and Direction of Forces

The forces that this approach to business network change is based on are not homogenous. As the brief description of forces according to physics clarified (found in section 2.4.2) a force is a vector quantity with both a direction and magnitude (Alonso & Finn, 1967; Weidner & Sells, 1975). One way to describe forces in business networks is consequently to borrow this view and see them as vectors of varying size and direction (Håkansson & Snehota, 1995) and both aspects of the forces are important in order to understand the character of forces and together, they can be used to describe two main types of forces.

Starting with the size of the force, this indicates how much impact the force will have on the business network, which is naturally hard to assess. The size of a force is dependent both on the force itself and on the receptiveness of the business network, for example the nature and degree of connectivity and responsiveness in the business network (Wilkinson, Wiley & Lin, 2001); the effect of a force is as important as the force itself. This can be compared to measures of earthquakes, where the Richter scale measures the magnitude of the actual earthquake, and the Modified Mercalli Intensity Scale instead measures the intensity of the observed effects (U.S. Geological Survey).

The other component of the force description, when using a vector resemblance, is its direction. The term 'direction' might be perceived quite deceptive when related

to business networks, but it is here used to denote whether the force acts in accordance with the current trajectory of the business network and conforms the existing business network structure, or if it challenges and alters it. These are by Håkansson and Snehota (1995, p. 276-277) called “restructuring” or “structuring” and by Madhavan, Koka and Prescott (1998, p.440) “structure-reinforcing” or “structure-loosening”, whereas Gadde and Håkansson (1992) make a distinction between changes (which from this view are forces) that have a stabilizing effect and those which lead to a new network structure. Another quite common way to dichotomize changes is to divide them into either incremental and radical, where incremental change can be described as adjustments within ongoing business relationships, whereas radical change is rather the break or establishment of a business relationship (Gersick, 1991; Halinen, Salmi & Havila, 1999; Kamp, 2005; van de Ven, 1992; Van de Ven & Poole, 1995).

From this thesis’ structural view of business networks, which is rather rough, there is a diametrical difference between changes that occur within the existing structure and changes that alter the business network structure. There is also a difference between weak and strong forces, irrespective of its direction. Therefore, to simplify the characteristics of forces, the thesis considers two main types of forces: *adjustive* and *radical*, explained more in the next section, and the dichotomy’s relation to the size and direction of forces is illustrated in the figure below.

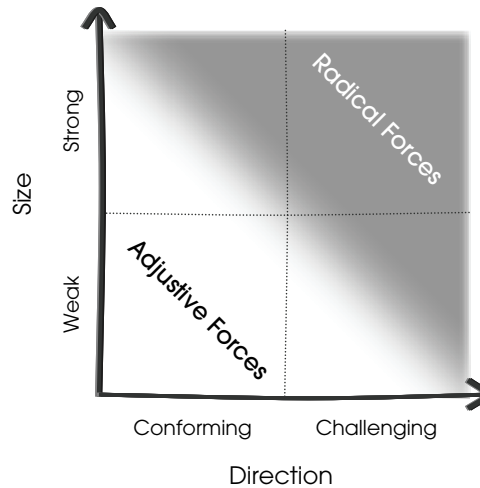


Figure 2.3 Two distinguished types of forces: Adjustive and Radical
Shown in relation to the size and direction of the forces.

Depending on the level of details included in the structural view, adjustive forces, causing changes within the existing business network structure, might be hard to notice. Due to this diametric difference, the structural impact-dimension will make up the main basis for the subsequent description of forces as either adjustive or

radical. It should however be noted that categorizing a force or change at the time it occurs can be problematic. It is hard to know if it is an adjustive force, causing a minor change, or the beginning of a revolving change, thus appearing to be a strong radical force (Gadde & Håkansson, 1992).

2.6.2 Adjustive Forces

The first type of force distinguished here is called 'adjustive', which indicates that this type of force is relatively weak and mainly cause adaptations of the existing business network structure. In all forthcoming illustrations, adjustive forces will be shown as light grey arrows, as in Figure 2.4, to the right. The main characteristic of this type of force is that it causes change within the existing business network structure. It builds on the existing structure and does not alter it, other than in business relationship characteristics. As the force follows the existent structure, it means that it also follows the current trajectory, or path, of the business network.



Figure 2.4
Visual representation of
an adjustive force

Adaptations are important in the development of business relationships (cf. Batonda & Perry, 2003; Håkansson & Snehota, 1995). Through adaptations of, for example, products, production and routines, the level of commitment to the business relationship increases, but doing so requires certain amounts of trust (Morgan & Hunt, 1994). Together these variables make up a central part of business relationships, and contribute to their long-term and mutual nature (Chetty & Eriksson, 2002; Hallén, Johanson & Seyed-Mohamed, 1991; Sandström, 1990). Thus, the structure-reinforcing adjustive forces can have a stabilizing effect on the business network (Gadde & Håkansson, 1992); largely a result of the increased inertia caused by idiosyncratic investments. However, it is important to note that adjustments of the existing business network can both strengthen and weaken the structure (Keep, Hollander & Dickinson, 1998). The term 'development' is often used in the sense that something is taken further, but some have also acknowledged various aspects of weakening which may or may not lead to a structural change (cf. Pradhan, 2000; Tuominen & Kettunen, 2003; Åkerlund, 2004).

An adjustive force can thus be defined as a force that has, or can be assumed to have, an effect, which takes place within the existing business network structure. This is quite similar to, for example, Halinen, Salmi and Havila's (1999) incremental changes and Gadde and Håkansson's (1992) stabilizing changes, but these concepts do not include the structure weakening forces, which are neither necessarily incremental (in the meaning of 'additional') nor stabilizing. The minor, successive adjustments caused by adjustive forces are necessary to keep the business relationships and business network going, and adjustive forces are in that sense 'everyday forces'. All the relatively small decisions made by the actors in a business network can require responding adjustments by their counterparts, and adjustive

forces thereby occur continuously (Gadde & Håkansson, 1992; Håkansson & Snehota, 1995). The scope and frequency of adjustive forces are part of setting the 'normal' state of the business network, and as they are relatively frequent, actors are likely to find handling adjustive forces more convenient. In that sense, the adjustive forces are a bit trivial and may even be hard to notice and identify for the involved actors as well as an observing scholar.

2.6.3 Radical Forces

Another type of force is the radical force, illustrated in Figure 2.5 as a dark grey arrow and substantially larger than the adjustive force arrow shown earlier. These rather strong forces challenge the existing structure and trajectory of the business network, so unlike the adjustive forces, the radical type of forces alter, or are likely to alter, the business network structure. The label 'radical' has been used in previous literature to describe larger changes, often the addition or ending of a business relationship (e.g. Halinen, Salmi & Havila, 1999; Kamp, 2005; Knobon, Oerlemans & Rutten, 2006) but also more general as restructuring changes (Gadde & Håkansson, 1992; Håkansson & Snehota, 1995).



Figure 2.5
Visual representation of a
radical force

Defining radical forces through their changing of the business network structure makes it relevant to consider what a structural change is. Depending on the level of details included in the business network structure, variations in the character of business relationships could well be considered to be a structural change, but as the adjustive forces cover most such changes, it is reasonable not to include them also in the radical forces. The radical type is thus more revolving and, in principal, results in structural change through the ending or addition of a business relationship (Halinen, Salmi & Havila, 1999). Whereas the termination of a business relationship clearly alters the business network structure, and the action or decision to end a business relationship consequently is a radical force, the establishment of a business relationship is a bit different. The basic idea of the business relationship as a mutual interaction, where trust and commitment are central aspects, makes the establishment of a business relationship inevitably a process dominated by change through adaptations, which in this division are mainly adjustive forces. Therefore, although the evolving business relationship at some point of time goes from not being defined as a business relationship to fulfilling those requirements, the addition of a business relationship to a business network is a less sudden change, which makes it a less radical force. For an actor to be part of a business network, it has to be involved in a business relationship with another actor within the business network. This means that adding, removing or merging actors is not what changes a business network; instead, it is the addition, ending or joining of business relationships that come with such a change.

The long-term character of business relationships shows that actors dare to adapt and commit to their business relationships (Hallén, Johanson & Seyed-Mohamed, 1991), which would not be the case if sudden endings were too common. This makes it reasonable to believe that radical forces are less common than adjustive forces, which should mean that most actors are probably less comfortable with and experienced in handling such forces. Relatively little knowledge, but serious effects, is a combination that motivates a further investigation into the radical forces. The assumed relatively low frequency of radical forces can make them problematic to study, and if the nature of business networks is studied based on radical forces, a low number of changes will probably be found, which can be one explanation for the perception of stability in business networks (Gadde & Håkansson, 1992). However, by looking at this stronger type of forces, the business network change may appear more clear, which makes it easier to study business networks and the change of them.

2.7 Inertia and Stabilizing Mechanisms

One of the elementary laws in physics is Galileo's Principle of Inertia, which is also incorporated in Newton's first law of motion (March, 1996). It says: *When an object is subject to no resultant external force, it moves with constant velocity* (Weidner & Sells, 1975, p.94). Velocity and direction created by some forces will thus be preserved until other forces influence the object in question. One such influencing force is friction. Friction occurs when two surfaces are in contact while one is moved in relation to the other, and has always a direction opposite to the object's movement. One effect of friction is the static-friction force (f_s), which makes up a threshold for other forces (F) to overcome in order to set the object in motion. If poking weakly on a box on a floor ($F \leq f_s$), it will not move. Instead, you must push harder, and when a force that overcomes the static-friction force is applied ($F > f_s$), the box will move.

If the box is given a hard push, it will slide away but quite soon stop again. As Newton's first law says that an object will remain in steady motion in the absence of any influence (Alonso & Finn, 1967; Bloomfield, 1997), there must be some force influencing it and making it decelerate. This is the second effect of friction, called kinetic-friction force (f_k), and if no force, or a force smaller than the kinetic-friction force ($F < f_k$), is applied in the current trajectory of the object, it will soon stop moving. To keep it moving, a force equal to or greater than the friction ($F \geq f_k$) must be applied in the direction of movement. The size of the friction force is decided by the normal force (given by the mass of the object and the gravity at its location), the object's velocity and the smoothness of the surfaces (Alonso & Finn, 1967; Weidner & Sells, 1975).

If not taken literally, the idea of frictions and inertia can be applied to business network and the suggested force-based approach to business network change. The inertia in physics is a stabilizing mechanism, and that concept is applicable also to business networks. Which overall direction the business network sequence will take

is not only dependent on which types of forces act in the business network, and the frequency of them, but also on how they are received by the business network. This selective reception makes up a kind of mechanism of the business network; a mechanism that decides which forces that will have much impact and which will be subdued, regardless of the size and direction of the force. This is called ‘network support’ by Håkansson and Henders (1995), and this ‘network logic’ can consequently be found by looking at patterns of the changes that occur (Håkansson & Snehota, 1995) as the mechanisms affect the behaviour of the actors (Gulati & Gargiulo, 1999; Johanson & Vahlne, 1990). There is also a resemblance to Gersick’s (1991) “deep structure”, and her work will be returned to later.

The mechanisms make the business network structure manage itself (Wilkinson, Wiley & Lin, 2001), and Jones, Hesterly and Borgatti (1997) describes social mechanisms as the core of the entire ‘network governance’ form of economic activity (cf. Powell, 1990; Uzzi, 1996). These mechanisms can thus be seen as the core of the business network, since they in a way are what makes it a business network. Understanding the mechanisms is thereby important in order to grasp the nature of business networks and business network change. It can be noted that what is here referred to as ‘mechanisms’ are in some literature called ‘forces’ (e.g. Gadde & Håkansson, 1992; Halinen, Salmi & Havila, 1999), which should not be confused with the forces described earlier. Nevertheless, there is an agreement in the belief that the mechanisms are a kind of collective characteristic of business networks. They are the base of the ‘network logic’ and create a purposeful, and consequently also comprehensible, path for business networks (Håkansson & Snehota, 1995).

An adaptation perspective has frequently been adopted, where business networks are assumed to be flexible and highly adaptive to cope with the creation and ending of business relationships (Kim, Oh & Swaminathan, 2006). This can, for example, be related to the organizational adaptability assumption within the resource dependency perspective (e.g. Pfeffer & Salancik, 1978). However, different barriers, such as switching costs (cf. Nielson, 1996) and a limited number of alternative counterparts, which are results of the dependence and commitment in business relationships, counteracts this flexibility. From a business network perspective, the development of strong business relationships, which are costly to replace, moderates the occurrence of radical forces in the business network and creates a tendency towards stabilising and preserving the business network structure (Halinen, Salmi & Havila, 1999; Håkansson & Snehota, 1995). With inspiration from organizational ecology, this is called ‘network inertia’ and can be defined as “a persistent organizational resistance to changing inter-organizational dyadic ties or difficulties that an organization faces when it attempts to dissolve old relationships and form new network ties” (Kim, Oh & Swaminathan, 2006, p.704). Network inertia can be caused by constraints in either the actors, relationships, network positions, the wider network and the environment, but should not be considered a failure, and is not to be confused with over-commitment (Kim, Oh &

Swaminathan, 2006). On the contrary, it is a consequence of a selection process, where the sustainable parts of the business network have survived (Hannan & Freeman, 1984).

Whereas the inertia keeps the business network in a relatively stable state, a “critical event” can break the stability and set the business network into a state of radical change (Halinen, Salmi & Havila, 1999). This view follows the description of business networks as stable yet constantly changing and suggests that stability is the normal state, i.e. change has to be created. Some question this assumption, and instead consider stability to be a surprising condition and suggest that stability has to be created whereas change is natural (Gadde & Håkansson, 1992; Weick, 1979). Due to resource heterogeneity (cf. Penrose, 1959), differences in knowledge and perceptions of the actors and limited information, there will always be opportunities to pursue (Eckhardt & Shane, 2003; Ghauri, Hadjikhani & Johanson, 2005; Johanson & Vahlne, 2006), and there is thus a constant source of change. A business network is never in a state of equilibrium (Halinen, Salmi & Havila, 1999; Håkansson & Snehota, 1995), and the network inertia should not be interpreted as such.

These stabilizing mechanisms are important in the force-based conceptualization of business network change as they are what the forces act against (cf. Kim, Oh & Swaminathan, 2006). The change-moderating inertia can be seen as the difference between the speed of reorganization, i.e. a kind of flexibility of the business network, and the rate and amount of forces (Hannan & Freeman, 1984). The mechanisms of business networks can consequently be revealed through the forces and the occurrence of change. Mechanisms, no matter what kind, can be hard to grasp in static situation, so the occurrence of forces could provide an opportunity to challenge and reveal the mechanisms.

Based on the mechanism aspect of business networks, the adjustive and radical forces can be described as either being within the allowing scope of the stabilizing mechanisms, or as challenging them. The adjustive forces are within what the stability mechanisms can handle, and thus preserve the overall business network structure as the changes mainly are in the form of adaptations. The radical forces, on the other hand, challenge the stabilizing mechanisms to the extent that some business relationships are actually added or removed from the structure. However, it is likely that too large a difference between the flexibility and the amount of forces, i.e. a large inertia, can be challenged also by a large number of adjustive forces. The mechanisms of business networks are however not only noticeable at the challenge of a force, but also after a force has caused a change of the business network. After a restructuring of a business network, further reconfiguration can be a result of the power balancing which sets the business network in a new sustainable configuration, as new opportunities are pursued (Forsgren & Olsson, 1992; Yamagishi, Gillmore & Cook, 1988). The mechanisms reduce or moderate the effect of some forces, whereas others are more likely to affect the business network. Different types of forces, with different origins, have a potential impact

on the business network, but they have to get through the stabilizing mechanisms in order to actually affect the business network. The inertia of the mechanisms increases the likelihood that forces in line with the current path of the business network are let through to affect the business network more easily than those forces that challenge it. Not only can the inertia neutralize, and remove, inappropriate forces, it can also have a moderating effect and make forces more in line with the prevailing path. The stabilizing mechanisms in business networks thereby explain how some forces have more affect than others do, but the mechanisms are not constant as they are products of the ever-changing business network.

2.8 Business Network Change Sequence

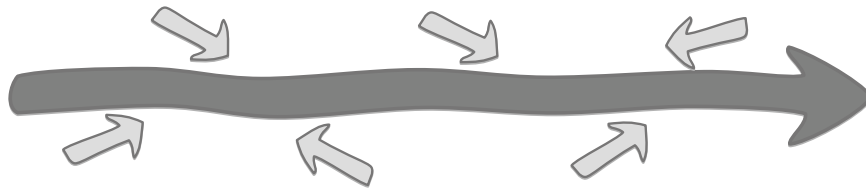
Just as different types of individual forces can be described, for instance the dichotomy of adjustive and radical forces, the compiled change sequence of the business network can be ascribed different characters. The previous sections have described how different types of forces can act on business networks and the focus has thus been on the individual forces rather than the overall business network change. All the forces occurring within a delimited business network cooperate with, or oppose, each other and the forces are seen as components, which together form the development of the business network. The overall business network change, when regarding the business network as a structure, is thus the resulting sequence of the forces and the forces that make it through the filtering effect of the stabilizing mechanisms can consequently be used as indicators of a business network change sequence. Based on that idea, this section will describe a dichotomy of business network change sequences as either evolutionary or revolutionary (cf. Håkansson & Henders, 1995; Håkansson & Snehota, 1995), which is a first step in describing business network change.

2.8.1 Evolutionary Business Network Change

Business network change has normally been seen as an evolutionary process, with gradual development (Halinen, Salmi & Havila, 1999). Evolution can be defined as: “The development or growth, according to its inherent tendencies, of anything that may be compared to a living organism (*e.g.* of a political constitution, science, language, etc.); sometimes contrasted with *revolution*. Also, the rise or origination of anything by natural development, as distinguished from its production by a specific act; ‘growing’ as opposed to ‘being made’.” (Oxford English Dictionary). The conception of change processes is thus often inspired by Darwin’s descriptions of evolution as a relatively slow stream of minor mutations, gradually being shaped by environmental selection (Gersick, 1991). Evolutionary models stemming from biology have also been used in business network research (e.g. Wilkinson, Wiley & Lin, 2001).

Taking the concept of evolution to business network change thus implies that the business network should evolve in line with “inherent tendencies”. Returning to Gersick (1991), and the punctuated equilibrium model, one finds that “during equilibrium periods, systems maintain and carry out the choices of their deep structure. Systems make adjustments that preserve the deep structure against internal and external perturbations, and move incrementally along paths built into the deep structure.” (p. 17). The current path, or trajectory, of the business network was earlier described as being set by the current structure and the stabilizing mechanisms. The evolutionary business network change sequence is consequently dominated by minor adaptations, and in the extreme case, only incremental change occurs (Halinen, Salmi & Havila, 1999).

Taken to its edge, this means that only adjustive forces act on the business network. Either there are no radical forces, or the filtering stability mechanisms of the business network are able to suppress or moderate the radical forces, making them less challenging for the business network. Evolutionary periods of business network change preserve the general pattern, and continue the contemporary path of the business network (Gersick, 1991; Halinen, Salmi & Havila, 1999). Figure 2.6 below illustrates a number of adjustive forces and the resulting smooth evolutionary business network change sequence.



Evolutionary Business Network Change Sequence

Figure 2.6 *Adjustive forces and the resulting evolutionary business network change sequence*

The continuation along a general and relatively smooth trajectory does, however, not implicitly mean that the evolution is towards an improvement and reinforcement of the current structure (Gersick, 1991). Whereas biological evolution perhaps mostly is associated with forwarding the species through a selection process, evolutionary business network change can also imply a degradation of the structure, which might seem like a setback. Following the current change path does allow for change in its direction through minor adjustments, and not only implies strict reinforcement of the present state. The gradual refinement of business networks can thus imply dissolution as well as strengthening, and expansion as well as reduction (Koka, Madhavan & Prescott, 2006).

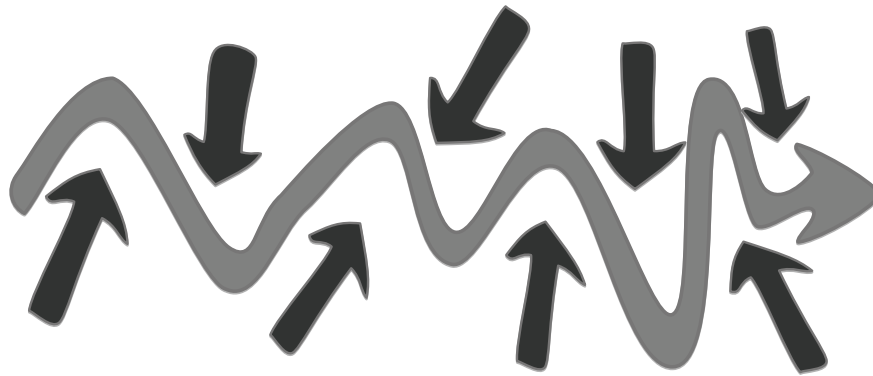
The everyday, and 'normal', adaptive changes makes the business network evolve gradually, and an evolutionary development of the business network can be considered the normal state (Halinen, Salmi & Havila, 1999; Håkansson & Snehota, 1995). Although the business network is changing, the change is stabilized by the business network structure and its mechanisms, and this can be interpreted as a kind of stability. Following the punctuated equilibrium model, long periods of evolutionary change is the normal state (Gersick, 1991), which could mean that companies are quite experienced in managing such situations. An important part of the punctuated equilibrium model is, evidently, the occurring punctuations of these evolutionary periods, causing revolutionary change.

2.8.2 Revolutionary Business Network Change

Central to the punctuated equilibrium model is the alteration between long periods of evolutionary development and brief periods of revolutionary disruption. A dictionary definition of revolution is "an instance of great change or alteration in affairs or in some particular thing" or "a turn or twist; a bend or winding" (Oxford English Dictionary). This great change is thus suggested to work as a description also of business network change, and the punctuated equilibrium has not only been used to explain the change of individuals, groups, biology etc. (Gersick, 1991), but also to explain the development of organizations (e.g. Feldman, 1998; Rajiv, Rudy & Tim, 2001; Tushman, Newman & Romanelli, 1986; van de Ven, 1992) as well as business relationships and business networks (e.g. Halinen, Salmi & Havila, 1999; Street & Cameron, 2007).

Gersick's (1991) description of revolutionary change gives further input on how it can be perceived: "Revolutions are relatively brief periods when a system's deep structure comes apart, leaving it in disarray until the period ends, with the 'choices' around which a new deep structure forms. Revolutionary outcomes, based on interactions of systems' historical resources with current events, are not predictable; they may or may not leave a system better off. Revolutions vary in magnitude." (p. 20). Firstly, this suggests that revolutionary periods are relatively short, and are an interruption of the normal evolutionary period. Revolution thus occurs when the deep structure is overcome, i.e. the current business network and its stabilizing mechanisms, and when the basic premises changes, all that is based on them also changes (Gersick, 1991). This leads to an unpredictable transition, but is a necessity for fundamental changes and a truly innovative result. Kuhn (1962) made good use of this way of reasoning in his explanation of scientific revolutions, where current mind structures have to be broken in order to achieve new perspectives. With the force-based approach to business network change, revolutionary change is a result of radical forces strong enough to outwit the stabilizing mechanisms (Håkansson & Henders, 1995). The radical forces interfere with the business network change path, and sets a new direction. A series of impacting radical forces are thus likely to seriously sway the trajectory of the business network. Instead of smoothness, a

revolutionary business network change sequence is characterized by unpredictable and overwhelming fluctuations, as is illustrated in Figure 2.7.



Revolutionary Business Network Change Sequence

Figure 2.7 Radical forces and the resulting revolutionary business network change sequence

A period of revolutionary change of the business network may be caused by reduced possibilities to pursue the current business, for example because of changed control of resources, and revolutionary change is likely to result in new business opportunities. It may also be caused by, for example, technological advancements, actors entering the business network and government legislation (Håkansson & Henders, 1995). Whereas evolutionary change is common and rather well described, revolutionary change is not. The relative infrequency of revolutionary change, and not least the revolving nature of it, means that managing a company through revolutionary change is a truly challenging task. Such situations are also harder to find as they, per definition, are not as common as the normal evolution (Gersick, 1991). On the other hand, when revolutionary change does occur, it shows. Studying revolutionary change could thus be a feasible way to further the understanding of business network change, as they make the change more notable. Gersick (1991) actually sees the occurrence of revolutionary change patterns as a way to get to the deep structure, which makes studies of radical forces and revolutionary change sequences very promising.

2.9 Dimensions Describing Business Network Change

By approaching business network change as a sequence of forces, the focus is on the changes, which allows for a more nuanced view of it. The contrasting of evolutionary and revolutionary descriptions addresses a possible variation in the character of the business network change, which is the first step in describing

business network change. However, that dichotomy does not offer a much-nuanced view, so this section is dedicated to suggesting a set of dimensions going deeper into the character of business network change. Following the force-based approach to business network change, the forces and their contexts will in this study be used to get to the resulting business network change sequence, and the occurrence of forces is what makes up the basis of these change descriptions. Worth emphasizing is that although the forces are what is analysed, they are aggregated to form a sequence of forces making up the change at a business network level, and it is the business network change sequence that is described through these dimensions.

This section contains a generic discussion of how business network change can be described, whereas further specification and suggested measures will follow later on. Two main descriptive dimensions, referred to as the intensity and contextual extensions of the change, together with some indicators of these dimensions, will be introduced next. Carefully considered dimensions of the change are required in order to enable a structured way of describing business network change, and one important issue is what kind of scales the dimensions should use. In this generic discussion, categorizations and dichotomizations will be used in the presentation of the dimensions, whereas more detailed ordinal categorizations and scales will be used in the specification and analysis in later chapters.

2.9.1 The Intensity of Business Network Change

To start with, the **intensity** of a business network change sequence is of outmost relevance. It reflects how much change that occurs, when it occurs and how radical the changes are. To start with, the *amount* of forces is suggested as a fundamental indicator of intensity. The idea is simply that a larger number of individual changes, or forces in this approach, mean a more intense business network change. This is naturally a highly relative aspect, as the scale hypothetically could extend from zero (0) to infinity (∞), so the use of relative categories that indicate whether there have been few or many forces should be useful. Figure 2.8 is an illustration of this aspect of business network change.

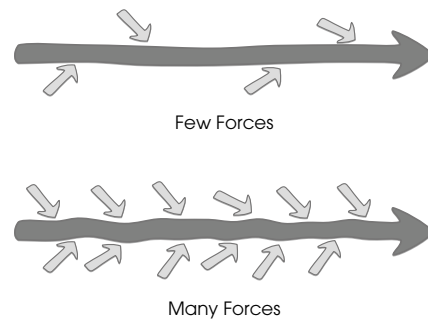


Figure 2.8 The amount indicator of the intensity of business network change. Showing few compared to many forces.

From the interest in including a longitudinal aspect, which is natural when studying change, the bare amount of forces becomes of limited interest in itself. One hundred forces might be much during a month, but is definitely less if they occur over a period of ten years, which clearly emphasizes the relativity of this aspect. The intensity dimension is therefore suggested to include an indicator reflecting the *temporal concentration* of the forces. The temporal patterns of changes have been addressed in some research (e.g. Dowling, 1983; Emery & Trist, 1965; Sheth, Gardner & Garrett, 1988), and although it can be addressed and measured in different ways, the basic issue is that there is a fundamental difference between a certain amount of forces spread over a long period of time, and the same amount of forces concentrated into a much shorter period. However, not only is this a question of including the length of the time period, it should also take into account the evenness of the distribution of the forces. The extremes of this indicator could be a spread versus a concentration, which is illustrated in Figure 2.9 where the same amount of force is distributed different in the two pictures. Which of these are the most intense could be discussed, but in the continued reasoning, a concentration of the forces to a shorter time-period is considered the most intense. Such a concentration of the changes makes it likely that the business network is seriously altered during that period, even though it implies that longer periods may be left without much change.

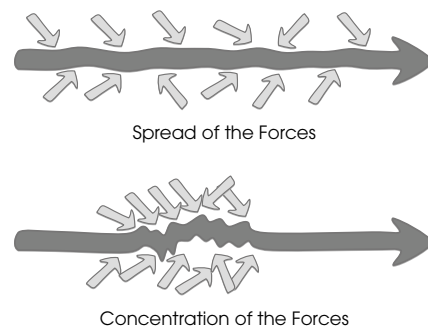


Figure 2.9
The temporal concentration indicator of the intensity of business network change.

Showing a spread compared to a concentration of forces.

Looking back at the dichotomy between evolutionary and revolutionary change shows that what was primarily addressed was the types of forces acting within the business network. That aspect is certainly worth including also in the set of descriptive dimensions, and considering the extreme cases, one end of this scale could be a sequence of only adjustive forces whereas the other consequently would be a sequence of merely radical forces. A more realistic and relevant division is perhaps that of a sequence of mainly adjustive forces compared to a sequence of mainly radical forces. These two archetypes are illustrated in Figure 2.10 to the right. Following how forces were described earlier, this indicator of the intensity aims at including the sizes and directions of the forces into the intensity of business network change and is henceforth referred to as the *radicality* of the business network change sequence.

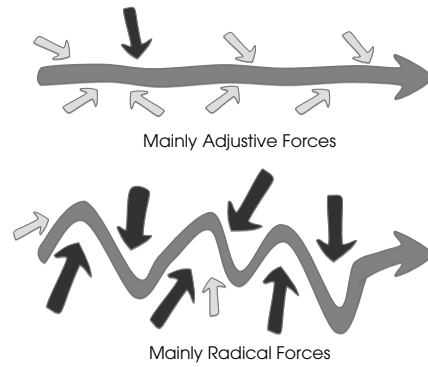


Figure 2.10 The radicality indicator of the intensity of business network change. Showing mainly adjustive compared to mainly radical forces.

Combining these sub-dimensions, the **intensity** of business network change is consequently a resultant of the amount, temporal concentration and radicality of the occurring forces. The intensity dimension can thus be considered to be a three dimensional construction, depicted in Figure 2.11 below.

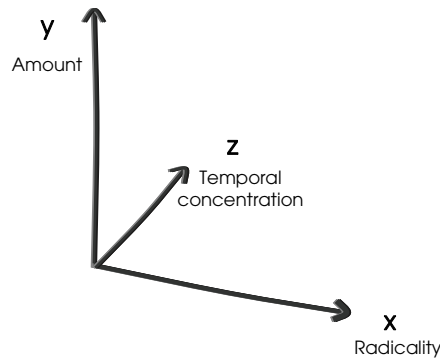


Figure 2.11 Three indicators of the intensity of business network change. With a basis in the occurring forces, the indicators are: the amount of forces, the temporal concentration of forces and the radicality of forces.

In essence, the maximum intensity of business network change is reached when a high level is estimated in all three indicators, i.e. the change sequence is made up of many forces (y) that occur during a relatively concentrated period of time (z) and are of a radical type (x), whereas few forces (y) that are spread out over an extended period of time (z) and are mainly adjustive (x) is the lowest thinkable intensity, according to this reasoning. The lack of absolutism of these scales means that the overall intensity, just as the indicators, is hard to assess with a continuous scale, which could make it reasonable to categorize the intensity of business network change rather roughly.

2.9.2 The Contextual Extension of Business Network Change

An interesting aspect, remaining untouched by the intensity dimension, is where the changes occur and how large part of the business network that is affected. The intensity dimension of business network change reflects how much, what type and when change occurred, approached through the forces, but just as a concentration of the forces in time differs from a spread of the forces over time, a concentration of the forces to a limited part of the business network differs from the spread of the forces over larger parts of the business network. This is here described as the **contextual extension** of business network change, which thus is based on the characteristics of the contexts of the occurring forces.

First of all, it is reasonable to consider in which dimension the contextual extension is assessed. In some situations, “spatial extension” has been used to reflect, for example, a geographic dispersion (e.g. Collins & Glenn, 1991) but in the current use, extension rather indicates a spread in the business network structure. Whereas the intensity was relatively manageable, the contextual extension is not as clear due to complexity and problems related to the metaphoric nature of spatial aspects of business networks (Henders, 1992). Somehow, the business network structure must be described in order to make it possible to place the forces in a spatial dimension, and this is done by analysing the parts of the network where the forces occur, i.e. the immediate contexts of the forces. Finding homogeneity in those parts indicates a spatial concentration whereas heterogeneity indicates widely spread change since the forces act on many different parts of the business network. Consequently, it is necessary to decompose the business network, and this can be done in various ways. This section will describe three general alternatives of decomposing business networks to address the character of the contexts of the forces, and a more specific approach to assessing the extension in the subsequent study will be described in chapter 4. The three suggested indicators all rely heavily on actors, and less on business relationships. Relationship-focused indicators of the contextual extension could offer a different understanding of the characters of business network change sequences, but an actor-focus has been taken to simplify the indicators.

Perhaps the simplest way to look into the contextual extension is to relate the forces to *individual actors* and thereby study actor extension, which is the spread of the forces over individual actors, shown in Figure 2.12. A low actor extension means that a large share of the forces is concentrated to a small share of the actors, which thus evidently affects those actors but also means that many actors, making up a large part of the business network, are not affected. A high actor extension consequently means that the forces affect large portions of the actors in the business network. In order to get to this aspect, the involvement of each actor in the forces are focused, and if also the roles of the actor in the involvements are included, another level of detail is added to the actor based indicator of the contextual extension of business network change. From an overall business network view, the change is considered greater if a large number of actors in the business network are affected by the change than if a confined part is changed repeatedly. This actor-based extension does, however, not delve deep into the diversity of a business network.

When regarding business networks as structures, it makes good sense to assess the extension of business network change based on the spread of the change over *structural positions*. 'Position' is a concept that sometimes is used as an actor characteristic in business network research (e.g. Anderson et al., 1998; Henders, 1992; Johanson & Mattsson, 1992), mainly as a qualitative variable, but positional aspects are also quite central within social network analysis, where there are many different quantitative positional measures (Everett & Borgatti, 2005; Freeman, 1979; Wasserman & Faust, 1994). Irrespective of the type of assessment, the occurrence of forces can be related to some kind of position of the actors involved, for example centrality, and if aggregating such an analysis, a measure of where in the business network the change occurs is obtained. As is shown in Figure 2.13, a high positional extension means that the forces act in a variety of positions rather than constantly in certain, for example peripheral, positions. Another meaning of the structural position

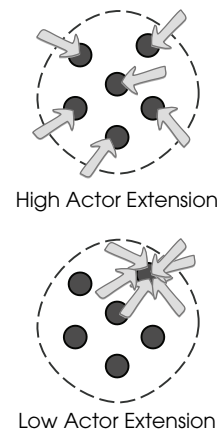


Figure 2.12
The actor based indicator of the contextual extension of business network change.

Showing a spread compared to a concentration of forces with respect to individual actors.

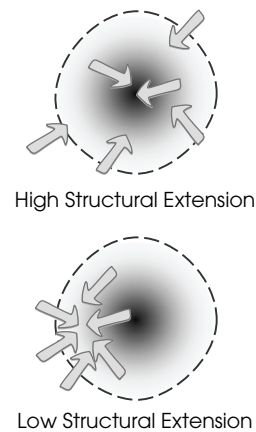


Figure 2.13
The structural position indicator of the contextual extension of business network change.

Showing a spread and a concentration of forces with respect to an assumed centre.

indicator of the contextual extension is how structurally coherent the changing parts of the business network are. If the parts on which forces act form a coherent structure, the extension of the change is considered lower than if they are more widely dispersed, which however depends on the amount of change and the size of the business network.

A third way to make an assessment of the extension of business network change is to use the heterogeneity of business networks, which offers a multitude of possibilities to get to the contextual extension. As all actors and business relationships, to some extent, are unique, formed by a large number of variables, business networks are heterogeneous (Easton, 1992; Hägg & Johanson, 1982) and the configuration of the actors and business relationships is likely to reflect this uniqueness. By dividing the actors into a number of categories, based on some characteristic of them, the heterogeneity of business networks is used to assess the spread in *actor categories*, which forms a third indicator reflecting the extension of business network change and is shown in Figure 2.14. Assessing the category extension of business network change is thereby done by looking at the character of the changing parts. The basis for the categorization could be different aspects relevant in business network settings, for example size of companies (Dean, Holmes & Smith, 1997), internationalization (Forsgren, Holm & Johanson, 2005; Johanson & Mattsson, 1988) and technology (Cunningham, 1995; Håkansson & Lundgren, 1995; Thomas & Ford, 1995), which all have been used as a variable in business network research. Besides these actor characteristics, the properties of business relationships could also be the basis for heterogeneity categorization in similar ways, which would require additional levels of detail.

Figure 2.2, which explained the general idea of the suggested approach to business network change, illustrated the overall trajectory of the business network as an arrow representing the result of the forces. As time passes, the business network moves along its path, which is affected by the sequence of occurring forces, and the business network can be considered the actual substance of the arrow. It is thus the

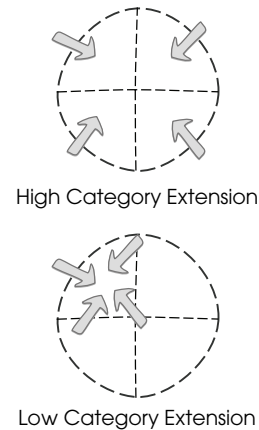


Figure 2.14
The category indicator of the contextual extension of business network change.

Showing a spread compared to a concentration of forces based on the four distinguished categories.

'traces' of the business network over time that forms the sequence, and consequently also the arrow representing the sequence, as shown in Figure 2.15 below.

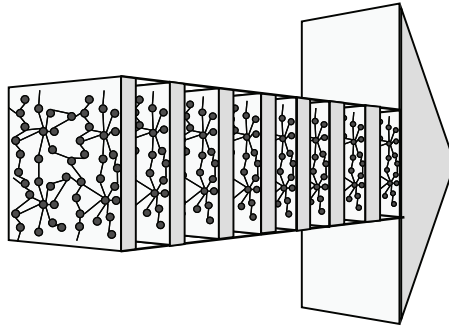


Figure 2.15 *The business network as the substance of the business network change sequence*

By identifying where the forces occur, the spread or concentration of the forces in actors, positions and categories can be assessed for that particular point in time. Where in the business network the forces act can vary over time, and the contextual extension of business network change hence reflects the spread or concentration of forces seen over the entire studied business network change sequence. Assessing the overall extension of the business network change is enabled by using the three types of spread: in actors, positions and categories. These are illustrated in Figure 2.16, and as shown, the contextual extension of business network change is suggested to be the joint result of these three indicators.

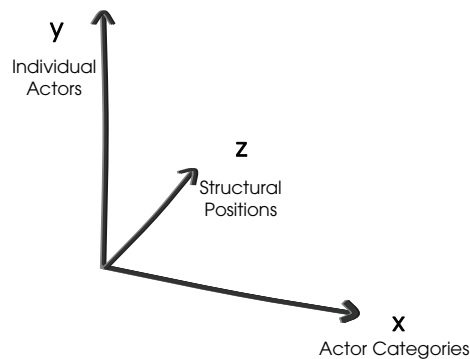


Figure 2.16 *Three indicators of the contextual extension of business network change*
This dimension is based on characteristics of the context of the occurring forces, which is assessed through: individual actors, structural positions and actor categories.

A maximum extension of the business network change is thus obtained when the forces are widely spread in regard to individual actors, structural positions and the selected actor categories. The three indicators are suggested to interact in such a way that a high spread is required in all three indicators in order to result in a high overall contextual extension. If the forces are concentrated in, for example, a certain category, the overall extension is significantly reduced. The suggested indicators offer a multifaceted approach to understanding where the forces occur, which is what the extension dimension reflects, based on the immediate contexts of the forces.

2.9.3 The Resulting Business Network Change Sequence

The intensity dimension, reflecting the amount, radicality and temporal concentration, and the contextual extension dimension, reflecting the spread in actors, positions and categories, address different aspects of the character of business network change. The two aspects could however be joined and together make up a description of the combined character of business network change. This is illustrated in Figure 2.17 below, where intensity and contextual extension make up the axes of a two dimensional matrix, and the combination of the two, i.e. the resultant, is the combined character of the business network change sequence.

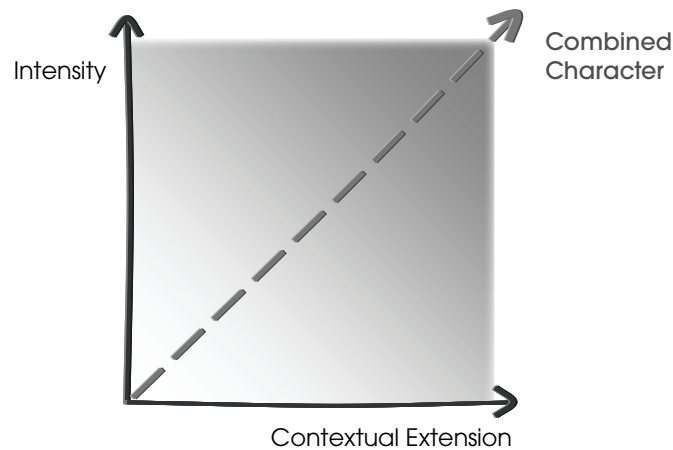


Figure 2.17 *The combined character of a business network change sequence
Seen as the resultant of the intensity and contextual extension*

High intensity is, quite naturally, positively contributing to the potential impact of the resulting business network change sequence. Whether a high contextual extension of the changes increases or decreases, the overall impact can be discussed, but in this model, it is believed that a high contextual extension, meaning that a large part of the business network is affected, leads to a greater overall business network change. A situation of the most revolving type of business

network change thereby means that many radical forces occur during a concentrated period and that the forces affect a large part of the business network, i.e. many different actors in different positions and representing different categories. A generally low overall business network change contains few, and mainly adjustive, forces which are spread out over a longer period, but constrained to a small part of the business network, thereby keeping the main part of the business network intact.

By judging the intensity and contextual extension of a business network change sequence during a certain period of time, the character of the studied business network change sequence can be assessed and the observation can be placed in the matrix shown in Figure 2.17. With the outlined force-based approach to business network change, the intensity and contextual extension describes the occurrence and spread of forces in the business network. It is thus the characteristics of the forces and the parts of the business network in which the forces appear that make up the basis of the placement in the intensity and contextual extension dimensions with this approach, but what is positioned in the matrix is an entire change sequence of a delimited business network during a delimited period.

2.10 Concluding the Suggested Approach

This chapter has described the basics of the business network perspective and this study's view of the business network as a structure rather than as a set of components. It has its focus on the business network level, making the business network extend beyond just being the context of a particular actor or business relationship. Following this view of business networks, and the desire to look further into the change and dynamics of business networks, a force-based approach to business network change has been suggested, based on ideas from fundamental physics and earlier business network literature. Following that approach, this study sees business network change, thereby meaning the overall change of a (delimited) business network, as a resulting sequence of the forces acting within that business network. This section concludes chapter two by summarizing the suggested force-based approach to business network change before the two following chapters further specify it.

Starting with the most elementary part of the approach, the forces are potential impacts on a business network, originating from within or outside the delimited business network. The forces are context specific, and the impact on their context is what defines them. A distinction has therefore been made between adjustive and radical types of forces. All inter- and counter-acting forces together form a business network change sequence, which is a result of all the forces occurring within a business network and thus describes change at a business network level rather than at a level of individual changes. The sequence of forces that actually affect the business network may not consist of all the occurring forces, so this chapter has also described stabilizing mechanisms in business networks, a kind of inertia

moderating the change. Although they are believed to be an important aspect for understanding business network change, these stabilizing mechanisms will however not be investigated in the upcoming empirical study.

This chapter has furthermore suggested two main dimensions describing business network change, namely the intensity and contextual extension, and these are an important part of the suggested approach. Some generic indicators through which these dimensions can be assessed have been presented in this chapter, and together they offer a way to evaluate the impact of a business network change sequence. The intensity of a business network change sequence is assessed based on the forces and their characters, and the three indicators of intensity are amount, radicality and temporal concentration. The contextual extension, on the other hand, is based on characters of the immediate contexts of the forces. It shows how widely spread the forces are in the business network and is assessed through individual actors, structural positions and actor categories.

The suggested force-based approach to business network change is, hopefully, an accessible way to get to the change of business networks while treating the business network as a structure, and its focus on the changes rather than the continuing business network structure should be advantageous when wanting to explore business network change. This is thus not a study of a business network and how it changes, but rather a study of the combined effect of forces underlying business network change. The way in which business network change is handled in this thesis is not primarily aimed at understanding how change spreads, but rather at being able to describe characters of business network change. Much could be learnt about the nature and mechanisms of business networks by studying its change, but it is important to understand the sacrificed understanding of stability that has been made to obtain a focus on the changes.

The suggested approach will be refined to an analytical model in the upcoming chapters, and applied in the subsequent empirical study. The approach is believed to make change appear more clearly, since looking at forces potentially affecting the business network makes business network change easier to identify and study. The approach varies between focusing on individual changes and change at a business network level, and this division will guide the next two chapters, where the suggested force-based approach to business network change will be adapted and specified based on the turbulence among Swedish IT-companies. Firstly, a chapter defining the forces and then a chapter defining the descriptive dimensions, based on the turbulent situation.

3 Mergers, Acquisitions & Bankruptcies as Events & Forces

The previous chapter described the suggested force-based approach to business network change in rather general terms in order to make it applicable to a wide variety of situations and events. The specific situation which this thesis will analyse was however described already in the introduction: the many mergers, acquisitions and bankruptcies involving Swedish IT-companies. The turbulent situation is thus considered a situation with several potential sources for business network change and the force-based approach will consequently be applied to mergers, acquisitions and bankruptcies involving Swedish IT-companies in the remains of this thesis. Before turning to the details of the study, some steps towards making the approach usable in empirical studies will be taken and the approach will be specified based on the studied situation. The specification, found in this, and the following chapter, is largely about describing assumptions, choices and statements of how mergers, acquisitions and bankruptcies are seen in relation to the suggested force-based approach. This chapter will focus on the parts of the approach that concerns individual changes, while change at the business network level is covered in the next chapter. Although the main interest of this thesis is on business network change, it is necessary to clarify the view of the individual forces before turning to the aggregated business network change.

3.1 Events Giving Rise to Forces

Central to the suggested force-based approach to business network change are the forces, which potentially causes change in a business network. As such, forces are a theoretical concept and can thereby not directly be captured empirically. Therefore, a bridge between the empirical phenomena and the theoretical concepts is needed, and to fulfil that need, ‘events’ are introduced to the force-based approach in order to get to the forces.

Quite simply, the forces are considered to be caused by ‘events’ that have potential effects on its context. ‘Events’ have been used in some of the extant literature to describe the origin of changes in business networks (e.g. Håkansson & Snehota, 1995; Madhavan, Koka & Prescott, 1998). Hedaa and Törnroos, for example, define events as “an outcome of acts or changes caused by man or nature” (1997, p.6) and “temporally specific outcomes of performed acts” (2002, p.35). In this thesis, ‘events’ are used to denote empirical occurrences that give rise to forces. Following the suggested force-based approach to business network change, all events that are likely to give rise to forces in the studied business network are of

relevance. An event is thus what is behind a force; it is a way to get to forces empirically. There is a close relationship between events and forces, but they are not equivalent and it is important to understand the difference. Events describe empirical phenomena whereas forces are abstract descriptions of the potential impact they have on business networks. Halinen and Törnroos (1995) describe events as being “our principal points of access to the structuring of social action in time.” (p.512). ‘Events’ are thus closer to what is observable, whereas ‘forces’ are part of the theoretical model, and this difference in the level of abstraction is essential to recognize.

Events and forces both address individual rather than aggregated ‘changes’, but the forces are not unhindered reflections of the events. This means that an event can give rise to several different forces, and separate events of differing kinds can cause two similar forces. The events do not necessarily cause change automatically, but they might create the need and conditions for change (Gersick, 1991) and each event can be considered a result of earlier events. This could be seen as forming chains of events, or “event trajectories” (Hedaa & Törnroos, 2002), but from a business network perspective, it is more relevant to analyze sequences of forces than sequences of events, although the latter may be used to get to the first.

There are naturally many different kinds of events that can give rise to forces, for example, alterations of a product or ceased purchasing of a particular component, and various events are likely to give rise to different types of forces. What causes the events may vary, and although the cause of the events is a wide issue largely left untouched in this reasoning, it is believed that there to some extent always is some kind of action taken by an actor (Hedaa & Törnroos, 2002; Håkansson & Snehota, 1995). A simple categorization of events can be made based on where the events occur, similar to how the origin of forces earlier was described as being either endogenous or exogenous. Hedaa and Törnroos (1997) describe events as being internal or external (p.3) or as being intra-net or extra-net (p.10), but in the following sections, events will be described with the same dichotomy as the forces; namely as being either endogenous or exogenous to the studied business network. In brief, endogenous events occur within the studied business network whereas exogenous events occur outside the studied business network.

3.1.1 Endogenous Events

Endogenous events are events that occur within the studied business network, i.e. events that involve some of the companies within the defined boundaries. A central part of business is management, which is a multiplex concept that includes for example strategy and leadership, but basically addresses companies’ ability to act (cf. Barnard, 1938; Thompson, 1967; Webster, 1979). Whereas the business network does not have the ability to act, the actors within it do, and some types of actions, made by actors included in the studied business network, can be events causing forces that affect the business network. Such events thus occur within the studied business network, i.e. they are endogenous. They have an important role

for the development of business networks, which makes the companies very important sources of change (Gadde & Håkansson, 1992; Hertz, 1998).

Strategy can be seen as either a plan or pattern (Mintzberg, Ahlstrand & Lampel, 1998), but regardless of which, it is a plan or pattern of events, with underlying actions. If looking at a company's behaviour as a designed strategy (cf. Selznick, 1957), it is a deliberate process of conscious thoughts. On the other hand, if looking at strategy as a retrospective description of the behaviour, the intentionality of the chain of events might be less evident. Regardless of whether strategy is an intended or emergent course of events, events can be more or less intentional. The span of endogenous events is really wide, covering minor internal adjustments of the company as well as larger changes affecting also other actors, such as changes in market presence, mergers and acquisitions or internationalization (Melin, 1992). If looking at strategy related to the suggested force-based approach to business network change, it concerns an individual actor's part in the business network change sequence. Each actor can perform actions that affect the business network, i.e. that give rise to forces, but each actor is also affected by all the forces created by the other actors involved in the business network. Strategy is thus about manoeuvring in the stream of forces, and although an individual actor's actions can have some effect, the actor may not end up where intended due to the many other forces occurring at the same time and due to the difficulty of predicting the forces yielding from specific events. Actors are thus both subject to forces and the objects causing the force, which means that they both get affected but also can affect others (Håkansson & Snehota, 1995). Consequently, actions should be seen in a wider context, which might render strategies less powerful as intended plans by one actor (Håkansson & Snehota, 1989), and acknowledging this interlacing of actions is possible through the force-based approach to business network change.

The environment of a company can be understood in various ways; from unpredictable and confusing to comprehensible and controllable (Mintzberg, Ahlstrand & Lampel, 1998). From a business network view, the context of a company consists of interconnected business relationships, and the role ascribed to the environment is thus affected by the used definition of business relationships. A business relationship involves two parties and implies a mutual dependence. This mutuality has the effect that the actors affect each other, but also that a business relationship cannot be created or changed by only one of the actors (Hedaa & Törnroos, 2002). Whether it concerns product adaptation, altered exchanges or relationship formation, both actors must be engaged (Forsgren, Holm & Johanson, 2005). An imbalance in the activity and engagement can lead to changes in interdependence, which affects the business relationship (Keep, Hollander & Dickinson, 1998). Actions taken by one of the actors affects the other (Forsgren, Holm & Johanson, 2005), but the other actor must "accept" the change in order for the intended effect to be achieved (Gadde & Håkansson, 1992). So, actors can act purposefully, but the results are always bound by the business relationship and the wider business network (Håkansson & Snehota, 1995). Strategic management

thus becomes complicated when companies are seen as being dependent on other companies, as the business network view implies.

Since business relationships are best understood in the context of other business relationships, thereby forming business networks (Håkansson & Snehota, 1989), the interconnectedness of business relationships should also be considered for understanding events. Whereas individual forces, manifested through events, can be ascribed to specific actors, the overall business network change cannot (Håkansson & Henders, 1995). Management should include consideration of the wider business network (Forsgren, Holm & Johanson, 2005), but change at that level is hard to predict, understand and handle (Håkansson & Snehota, 1995; Ritter, Wilkinson & Johnston, 2004). By acknowledging the environment of companies, a business network approach could give a more nuanced view of strategy (Forsgren, Holm & Johanson, 2005), and understanding the mechanisms and processes of business network change should therefore be advantageous to management (Håkansson & Snehota, 1995).

Why different actions are taken naturally varies, but since a company can be described as a set of productive resources of which entrepreneurial and managerial functions should discover and accomplish various combinations (Penrose, 1959), strategy can be considered closely related to resources. It is thus about making choices and actions in order to make the most out of a limited set of resources, and all actions taken by a company can, with this view, be seen as pursuits of productive opportunities. As the business relationships and the business network makes up the setting for the company, they both provide opportunities to act on and impose restrictions on the company's actions (Andersson, Blankenburg Holm & Johanson, 2005; Ghauri, Hadjikhani & Johanson, 2005). An opportunity is something valuable occurring in the market, which can be discovered and made use of by a company. Opportunities can be developed through ongoing business relationships, thus being a continuous process (Pahlberg & Thilenius, 2005), but they must be discovered (cf. Kirzner, 1997) and acted upon to be of any value (Pahlberg & Persson, 2005).

Business relationships are results of past interaction and make up the basis for future development. The existing structure imposes some expected activities, 'taken-on-activities' derived from their positions, but is at the same time constantly reproduced through intentional activities, 'made-up-activities' derived from roles (Anderson et al., 1998). The opportunities on which companies can act are thus given from the business network's current state, but the current business network also restricts the possibilities through commitments, which reduces the input of new opportunities, and this can be apprehended as stability (Gadde & Håkansson, 1992). So, actions such as mergers and acquisitions, which on one hand can be seen as attempts to exploit and realize profit opportunities (Baraldi & Strömsten, 2005), can shake the current structure, which in some cases might be necessary to challenge the more central actors, and create new opportunities (Gadde & Håkansson, 1992). The basis for opportunities can, for example, be differences in

knowledge (Penrose, 1959) or different perceptions of future outcomes (Gadde & Håkansson, 1992), but new opportunities can also be revealed or created by endogenous and exogenous events. However, even if an action is triggered by the environment (cf. Pfeffer & Salancik, 1978), it is considered endogenous as long as it is taken by an actor within the studied business network. So, when an opportunity is acted upon, and causes change, it might create, or make visible, new opportunities, so one change is thereby likely to cause further change through the new opportunities.

The actions of a company, or 'strategy' in a wider sense, are thus based on the opportunities given by the current situation, and although business networks are generally not manageable by an individual company, a firm can be proactive and, to some extent, manage the allocation of resources (cf. Håkansson & Ford, 2002; Ritter, Wilkinson & Johnston, 2004). Change is thus a natural part of business as companies act on perceived opportunities, abandon unprofitable efforts or adapt to changed conditions (Eckhardt & Shane, 2003; Ghauri, Hadjikhani & Johanson, 2005; Johanson & Vahlne, 2006), and from a business network perspective, this shows as change in and of the business network. So, just as change is a fundamental part of business, it is also a fundamental part of business networks.

3.1.2 Exogenous Events

Turning to the exogenous events, these are events that take place outside the studied business network. As have been mentioned, events within the studied business network that are caused by external factors are still considered endogenous, but the external factors can, simultaneously, in themselves give rise to forces, and it is thereby reasonable to also consider exogenous events. This includes macro level issues, but also issues in the network structure extending beyond the studied business network. Exogenous events are thus events that occur outside a studied business network and have a (potential) effect on it, but should not be confused with events caused by reactions from actors in the studied business network to exogenous events. The exogenous events are, in this line of reasoning, not considered in their affect on individual actors (cf. Pfeffer & Salancik, 1978), but as giving rise to forces impacting the studied business network.

Examples of external factors of the macro level type that can be seen as exogenous events are changes in economic conditions, political issues and jurisdiction (Harrison & Easton, 2002; Madhavan, Koka & Prescott, 1998) technological development (Forsgren, Holm & Johanson, 2005; Gadde & Håkansson, 1992; Madhavan, Koka & Prescott, 1998) and market growth (Keep, Hollander & Dickinson, 1998). This kind of environmental events are most likely very complex to predict and understand for a company (Håkansson & Snehota, 1995), and nor are they part of a process that can be fully controlled (Forsgren, Holm & Johanson, 2005). Koka, Madhavan and Prescott (2006) describe business network change as being driven by environmental changes, where the strategic orientation of a company can have a moderating effect.

Different types of environment can be described, for example based on the organization of environmental elements and the rate of change of the environment, which leads Dowling (1983) to a categorization of 'placid random', 'placid clustered', 'disturbed reactive' and 'turbulent' forms of environment. The difficulty of predicting exogenous events is reflected in the focus on environmental uncertainty, which is considered to cause change (Keep, Hollander & Dickinson, 1998), and, for example, strategic alliances are claimed to manage environmental change and uncertainty (Gulati & Gargiulo, 1999). It should, however, be noted that most literature addresses the environment of a specific firm, not of a business network as is intended here.

3.2 Mergers, Acquisitions and Bankruptcies as Events

A large variety of events can be considered to give rise to forces of different kinds, and an empirical study of business network change thus needs a situation with some sort of events. Returning to the turbulence among the Swedish IT-companies, as was described in the introduction, the many mergers, acquisitions and bankruptcies could be one such situation. Quite a large amount of research, with different approaches and focuses, has been done on mergers, acquisitions and bankruptcies, the first two in particular. Furthermore, looking into the business press, and judging from the availability of relatively normative literature, mergers and acquisitions are also a popular topic for managers.

This section will provide an explanation of mergers, acquisitions and bankruptcies in two parts: first regarding mergers and acquisitions, then bankruptcies. This is an important start for viewing mergers, acquisitions and bankruptcies as events giving rise to forces, in accordance with the suggested force-based approach to business network change. Further aspects of regarding mergers, acquisitions and bankruptcies as events will thereafter be described in order to specify some of the implications of viewing them as events. More specifically, later sections will address individual mergers, acquisitions or bankruptcies as occurrences rather than processes, and they will be assumed to give rise to forces, i.e. to affect the context in which they occur.

3.2.1 Mergers and Acquisitions

Mergers and acquisitions (M&As) are not new phenomena, neither to companies nor research. Rydén (1971) points out that an increase in the interest on M&A during the 1960s must not be confused with the phenomenon as such; mergers of organizations has probably been occurring ever since the industrialization started during the eighteenth and nineteenth centuries. Research goes back at least to include mergers and acquisitions during the later half of the nineteenth century in both America (e.g. Conant, 1901; Nelson, 1959) and Sweden (e.g. Ljunggren, 1912). The fact that M&A has attracted the attention of scholars for more than one hundred years has naturally resulted in an extensive body of literature describing

studies performed in different ways and with different focuses. However, Bower (2001) is of the opinion that “we know surprisingly little about mergers and acquisition, despite the buckets of ink spilled on the topic” (p.93). Bower continues with an ironic summary of the knowledge contained in the, by all means respectable, amount of research on M&A in a few sentences: “Acquirers often pay too much. Friendly deals done using stock often perform well. CEOs fall in love with deals and don’t walk away when they should. Integration’s hard to pull off, but a few companies do it well consistently.” (p.93).

Mergers and acquisitions have thus been studied quite a lot, but what is meant with a “merger” or an “acquisition” varies. What is interesting with mergers and acquisitions to this study is the consolidation of two companies that they imply. The difference between a merger and an acquisition is by some disregarded and the two terms are thus used synonymously (e.g. Jensen, 1984; Trautwein, 1990). Inherent in the word ‘acquisition’ is, however, that one company takes over another, and when a difference between the two terms is made, ‘merger’ is often used to denote an equal consolidation of two or more companies, while ‘acquisition’ is used when one company is gaining direct or indirect control over another (Larsson, 1990; Rydén, 1971). A difference is furthermore made between mergers and acquisitions in a legal sense (Justitiedepartementet, 2005), and the legislation imposes a number of different requirements associated with the types of consolidation (Holtström, 2003). However, the legal aspects are not essential to this study.

Rydén (1971, p.31) uses the terms “merger by acquisition” and “merger by consolidation”, which clearly points at the similarities since they both involve a merger aspect. Due to the many similarities, especially concerning the integration of the consolidating companies, much of the literature deals with “M&A” as one concept and this chapter will describe both mergers and acquisitions, as well as research about them, without making a definite distinction. It is naturally hard sometimes to decide whether a consolidation of two companies is on equal terms, making it a merger, or if one of the companies has a more dominant position, making it an acquisition. Just looking at the ownership percentage might not be enough, and the definition, as well as the precision, clearly varies with the objective and perspective of whatever study is intended. What M&A is about is businesses combined in some way, but this can be anything from merely a legal classification or ownership change, to a complete integration of the businesses and organizations.

It is of relevance to note that mergers and acquisitions do not just happen; companies must act in order for them to take place, and it can thus be seen as a strategic action, e.g. to handle globalisation, competition and technological development (Bower, 2001). As much of the M&A research has been based on a strategic perspective, quite an amount of literature have taken an interest in strategies and choices concerning mergers and acquisitions. In which order the choices are made might be hard to tell, but primarily they deal with questions such

as the 'direction', extension and counterpart of the merger or acquisition. These decisions make up different types of M&A and the effects may vary with the decision. Without going further into the strategic decision making in connection to them, the relevance of considering mergers and acquisitions from a managerial point of view is worth noticing.

3.2.2 Bankruptcies

Bankruptcy is a legal act involving liquidation of a company due to insolvency, i.e. inability to pay its debts. The idea behind bankruptcies is closely related to the limited liability of most types of companies, and enables reorganization of businesses (Claessens, Djankov & Mody, 2001). There is quite an amount of literature on insolvencies, dealing with issues such as reasons for bankruptcy (e.g. Bulow & Shoven, 1978; Koponen, 2003), prediction of bankruptcies (e.g. Back et al., 1996; Norton & Smith, 1979), laws and regulations (e.g. Falke, 2007; Jackson, 1985), and bankruptcies in relation to mergers and acquisitions (e.g. Bulow & Shoven, 1978; Shrieves & Stevens, 1979). The effects of bankruptcies have been studied in monetary terms (Iqbal, 2002; Warner, 1977), but the effect on business networks seems largely untouched.

There are different types of, and reasons for, bankruptcy, and consequently, a difference can be made between variations such as insolvency, default and illiquidity (Claessens, Djankov & Mody, 2001; Ventura, 2004). The formal type of bankruptcy is however of minor interest to this study. Instead, the term bankruptcy denotes all situations where a company is put out of business because of economic difficulties. From a management point of view, which is of great relevance to business studies, bankruptcies are quite different from mergers and acquisitions. One evident difference is that bankruptcies, or at least the financial distress behind it, are normally not deliberate and planned (for exceptions, see McCullough, 1991; Moulton & Thomas, 1993), and the unintentional nature of this kind of event is an important characteristic in comparison to, for example, deliberate actions such as the closure of a subsidiary. Bankruptcies are thus, by their nature, of limited managerial value at least in terms of creating future value, even though present losses could to some extent be governed and limited through filing for bankruptcy. Bankruptcies are not primarily intended to gain a future value quite logically because the company ceases to exist and thus has no future. This is another important point to make. Regarding this study's interest in change of a structure over time, such a structure would, if dominated by bankruptcies, be characterized by a constant decomposition.

3.2.3 Mergers, Acquisitions and Bankruptcies as Endogenous Events

The earlier division between endogenous and exogenous events strongly relates to whether the event takes place within or outside the studied business network, which makes it relevant to know the boundaries of this study's business network. The focus of this study is on mergers, acquisitions and bankruptcies involving

Swedish IT-companies, and the changing business network, as will be specified later, is delimited based on these mergers, acquisitions and bankruptcies. Consequently, the mergers, acquisitions and bankruptcies that will be included in the study are all events taking place within that business network, which means that they are endogenous. The causes of mergers, acquisitions and bankruptcies are not specifically looked further into in the current study, but classifying the events as endogenous makes it relevant to reflect on the intentionality of the events. Mergers and acquisitions are surely more often strategic actions, i.e. the result of managerial decisions, than bankruptcies. The intentionality is thus greater in mergers and acquisitions than in bankruptcies, which make them more interesting from a managerial point of view.

3.3 Ways to Treat Mergers, Acquisitions and Bankruptcies

It is relevant to consider how mergers, acquisitions and bankruptcies are treated and viewed, and how that relates to the suggested force-based approach to business network change. To keep it simple, two types of treatments will be distinguished: as processes or occurrences. Figure 3.1 illustrates this dichotomy, further described in the following sections specifically addressing mergers and acquisitions, although a similar line of reasoning could be applied to bankruptcies. To start with, it is important to note that the occurrence or process treatment is not a dichotomy of mergers, acquisitions and bankruptcies, but of how they are viewed.

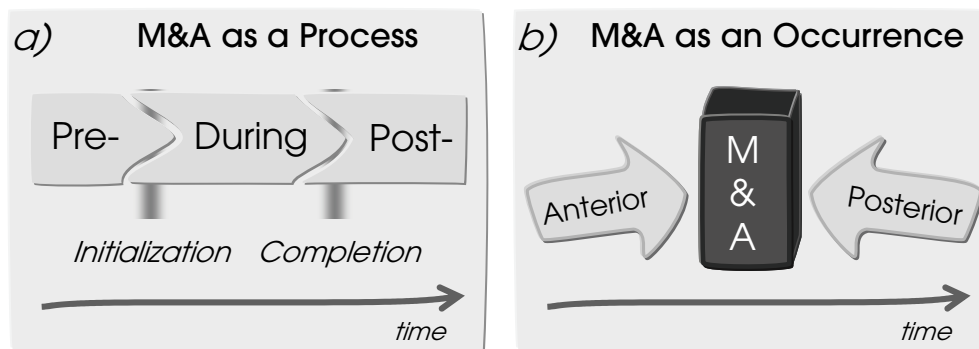


Figure 3.1 M&A as a Process and Occurrence

Part a) shows an elementary phase-model applicable to mergers and acquisitions whereas part b) shows a treatment of M&A as an occurrence.

3.3.1 A Process View

The term '**process**' is used in many different ways (van de Ven, 1992), but some rather unanimous dictionary definitions of the word process as a noun are: "a series of actions or steps towards achieving a particular end" (The Concise Oxford English Dictionary) and "a series of actions or operations conducing to an end" (Merriam-Webster). A process is thus a sequence of actions or steps, which clearly

includes the notion of time; “Course, lapse (of time). [...] in course of time, as time goes on” (Oxford English Dictionary). Time can however be approached and perceived differently, which might be a problem in process studies (Tuttle, 1997). The existence of a specific goal is also recurrent in the dictionary definitions, which elegantly is reflected in the use of the word process to “designate the course of becoming rather than being” (Oxford English Dictionary).

In strategic management literature, van de Ven (1992, p.169) distinguishes three common meanings of the term, which imply very different approaches to change. These three meanings should all be possible to apply to M&A research, which thereby includes studies focused on 1) the causality between states, 2) changes in variables over time and 3) historical developments of sequences of activities. The different approaches are suitable for different aims, and taken together, they are quite extensive in their inclusion. Pettigrew (1997) notes that only the third meaning “explicitly and directly observes the process in action and thereby is able to describe and account for how some entity or issue develops and changes over time” (p.338). The definition he uses is “a sequence of individual and collective events, actions, and activities unfolding over time in context” (Pettigrew, 1997, p.338). Even more simple is Tuttle’s (1997) view of process as “a series of activities spanning a period of time” (p.349).

If looking at mergers and acquisitions as a series of actions that extend over some time, they could firstly be divided into three different stages: pre-merger, during the merger, and post-merger (Appelbaum, Gandell, Shapiro et al., 2000; Appelbaum, Gandell, Yortis et al., 2000). The labels of the phases might vary, but the description of the realization of an acquisition or merger, preceded by a preparation phase and followed by an evaluation phase, is undoubtedly useful in its simplicity. This elementary pre-during-post model can be modified, and specified, depending on the focus. For some purposes, a more detailed model describing sub-stages, or only a part of the whole process, is perhaps more suitable. Examples of stage-models can be found on different occasions, also outside the research literature. For example, one found in a prospectus for admission to the stock exchange (Unlimited Travel Group, 2006) describes a five staged acquisition process: Identification-Assessment-Negotiation-Implementation-Follow-up (p.24), thus emphasizing the pre-M&A phase. The illustration of this simple stage-model of mergers and acquisitions found in part a) of Figure 3.1 has markers at the transitions between the stages, which could also be interesting to study. First is the transition that initializes the merger, and moves from the preparation in the pre-merger phase to the realization during the merger, and second is the point where the merger is completed and the during-merger phase is thus left in favour for the post-merger stage. Obviously, defining these points in time, when the process moves from one phase to another, could be hard or even impossible in practice, but they are useful when discussing M&A conceptually.

A process view of M&A has been common, and a large variety of aspects can be found in literature, which sees the merger or acquisition as a sequence of actions

and stages, of which some part or stage may be focused. Following the simple process-model of M&A, some examples of aspects in the pre-merger phase, during-merger phase and post-merger phase can be mentioned. To start with, an example of a pre-M&A issue, i.e. before the realization of the merger, are *motives*. M&As are made to achieve some kind of goal, and if the goal is unclear, the merger or acquisition will be hard to perform (Bower, 2001). Mergers and acquisitions are ways for companies to grow, to take control over resources or perhaps to overcome some obstacles. A common dichotomy, which can be seen as a foundation of company growth reasoning, is between internal and external growth (e.g. Harrison, 2003; Penrose, 1959; Sirower & Lipin, 2003; Wilson, 1980). Internal growth is accomplished by using the company's own resources to expand its business, which generally is slower but less risky, whereas external growth turns to cooperation with or acquisition of other companies (Harrison, 2003). The possibility to combine resources through mergers and acquisitions enables a greater rate of expansion and a growth in larger steps (Penrose, 1959), although many consider acquisitions to have a very low success rate (Datta, 1991; Norton, 1998; Perry & Herd, 2004). Growth can thus be accomplished through the internalization of another company's resources, including for example personnel and sales, which consequently give control over those, perhaps critical, resources (Wilson, 1980). So, for example market entry barriers can be an obstacle potentially overcome through a merger or acquisition (Yip, 1982), and the role of mergers and acquisitions in foreign market entry has been devoted some attention (e.g. Andersson, Johanson & Vahlne, 1997; Barkema & Vermeulen, 1998; Buckley & Casson, 1998; Cheng, 2006; Malkoff, 1979).

The reasons behind a merger or an acquisition has attracted a substantial amount of attention (Larsson, 1990) and a number of reviews and categorizations of M&A motives have been undertaken (e.g. Erixon, 1988; Goldberg, 1983), although some scholars consider mergers and acquisitions to be driven by a complex pattern of motives, thus not explainable by a single motive (Lu, 2006; Rydén, 1971; Trautwein, 1990). However, some of the categories presented by Trautwein (1990) are interesting to mention. In a category called 'process theory', M&A is seen as an unintended result of a company's business processes, even though managers might claim otherwise. However, more dominating is the view of M&A as a rational choice, of which 'Efficiency theory' is one example. It sees M&A as planned action with the objective to achieve favourable synergies, which is a commonly claimed motive from merger makers that want to justify their actions, and likewise a common M&A motive discussed in literature (Holtström, 2003; Larsson, 1990; Ljunggren, 1912; Porter, 1998a; Schmitz & Sliwka, 2001). The field of theories on synergy is extensive, and different types of synergies can be achieved, for example market power, financial, operational and managerial (Ansoff, 1965; Chatterjee, 1992; Lubatkin, 1983), economies of scale (Ljunggren, 1912), and available information (Trautwein, 1990). The results from different studies however seem ambiguous, as some confirm synergies while others claim that they are rarely realized. For example, some positive effects on the stock market have been found,

mostly beneficial to the target's shareholders, but the rationality and real performance of merging companies is questioned on various grounds (Anderson, Havila & Salmi, 2001; Pfeffer, 1972; Trautwein, 1990). Turning to another driving force, namely personal incentives of the managers, 'empire-building theory' ascribes M&A to the desire of managers to extend their power and increase their personal utility. The desire to build an empire could even result in managers overpaying for the target company (Varaiya & Ferris, 1987). The empire-building theory has received popularity in the press and support in studies, but is seldom admitted by managers.

The motives for the target firm to be acquired are certainly less acknowledged than the motives to acquire. One such could be to avoid demanding and costly administrative measures legally imposed on medium-sized companies (Calegari & Turetsky, 2006), but in some cases, the target company might not have a positive attitude towards the acquisition, which can be referred to as a hostile takeover (Franks & Mayer, 1996; Hanly, 1992; Hirshleifer & Titman, 1990; Neale et al., 1998; Pearce & Robinson, 2004). In the pre-merger phase, the *target selection* is very important, and requires quite some information collection. It has attracted some interesting research (e.g. Nakamura, 2005; Salter & Weinhold, 1981; Sharp, 1983; Singh & Montgomery, 1987), and much has come to centre around strategic and organizational fit (e.g. Datta, 1991), e.g. if the companies are similar or easily adjustable. Part of the preparation is also the financial aspects of *target valuation* (Melicher, 1969), which is preceded by an analysis sometimes labelled *due diligence* (Perry & Herd, 2004; Puranam, Powell & Singh, 2006). Such informative work is naturally important to improve the outcome of the M&A (Fluck & Lynch, 1999), and earlier experiences from acquisitions are a good help (Haleblian & Finkelstein, 1999; Haleblian, Kim & Rajagopalan, 2006; Hayward, 2002). Following the preparations is *negotiation*, containing for example financial, legal and power issues (Pablo, Sitkin & Jemison, 1996; Walsh, 1989), and eventually also an *announcement* of the deal, which for example can cause some reactions on the stock market (Shusterman, Norsworthy & Bessler, 2000; Tan & Hooy, 2004), together with other forms of *communication* (Appelbaum, Gandell, Shapiro et al., 2000; Appelbaum, Gandell, Yortis et al., 2000; Sirower & Lipin, 2003).

The during-M&A phase comprises many issues related to the integration of the two companies. The integration is largely where and when the goals, e.g. expected synergies, are to be realized, and the potential value can easily be destroyed if this integration is not managed carefully (Belcher & Nail, 2000; Cappelli, 2006; Chatterjee, 1992; Datta, 1991). Integrating merging companies is a complex procedure that must be adapted to the prerequisites and goals of the specific merger (Bower, 2001). A number of integration models and typologies addresses this complexity by describing differences in the integration process, for example based on acculturation (Nahavandi & Malekzadeh, 1988), the desired level of integration (Haspeslagh & Jemison, 1991) or the mode of integration (Schweiger & Goulet, 2000).

One way of looking at integration issues is to divide them into the acquiring firm's management's integration decisions and actions, and the target firm's members' reactions (Stahl & Sitkin, 2002). Another approach, described by Shrivastava (1986), is to divide integration into three types: procedural, physical and managerial & socio-cultural integration. The procedural integrations contain, for example, information systems, which are critical to many companies. Integrating two different information systems, operating in two different organizations, has turned out to be quite problematic (Evgeniou, 2002; Giacomazzi et al., 1997). The physical integration concerns physical assets and production systems, and although difficulties can arise, especially if the companies are geographically dispersed, they are relatively tangible (Shrivastava, 1986). Less predictable are the more tacit aspects of the organizations that must be handled, for example *employee attitudes* and *corporate culture* (Gertsen, Søderberg & Torp, 1998; Larsson, 1990), which are considerable fields within the M&A research (Napier, 1989). Cultural factors, i.e. differences in the collective mental programming (Hofstede, 1983), and acculturation, where two companies' cultures are combined into one, is perhaps the most critical part of the integration (Shrivastava, 1986), even more so in international M&A (Larsson & Risberg, 1998). A merger or acquisition can by some employees be regarded as a threat, creating great uncertainty (Cappelli, 2006; Risberg, 2001), and communication is thereby of outmost importance (Appelbaum, Gandell, Yortis et al., 2000), not least to avoid losing many important employees, managers and competences (Choi, 2001; Krug & Hegarty, 1997; Walsh, 1989)

The post-M&A phase contains some aspects related to the *outcome* of the consolidation, which sometimes is described in terms of success or failure, both among scholars and practitioners. The success rate is often considered low, and as much as 80% (Johnson, 2006; Norton, 1998) or 50% (Datta, 1991; Perry & Herd, 2004; Porter, 1987) have been deemed as failures. Weston and Weaver (2001) divide the reasons for failure into three areas: due diligence, cultural factors, and implementation difficulties. From a somewhat simpler view, the outcome is naturally highly dependent on the expectations, i.e. the motive and goals of the M&A, and the extent to which the goals are reached, whatever they are, should be the basis of discussing success or failure. Interesting to consider is that the proposed high failure rate should have a deterrent effect, but companies still continue to do acquisitions. The discouraging numbers may be presented to promote the business of M&A consultants, and the allocation of more resources to the research on M&A, but whatever the success rate is, there are surely good reasons for doing more studies on mergers and acquisitions.

3.3.2 An Occurrence View

Treating mergers and acquisitions as **occurrences** is here used as the opposite to treating them as processes, which can be expressed as "a thing that occurs, happens, or takes place" (Oxford English Dictionary). Studies with an occurrence view of mergers and acquisitions treats them as a black-box; the consolidation of

the companies has occurred, or is potentially occurring in the future, but how it is performed is of minor interest (cf. Rydén, 1971). As was shown in part b) of Figure 3.1, the merger or acquisition can be approached both from an anterior stage and from a posterior stage, and in that sense, the M&A is a separator between two states. Studies made with an occurrence view can roughly be divided into three main approaches: 1) studying aspects preceding the M&A, 2) studying occurring M&As in aggregate, and 3) studying aspects following the M&A. Seeing M&A as a separator between states enables various kinds of comparative studies, where some aspects are studied before and after the merger or acquisition (Dooley & Zimmerman, 2003). The retrospective approach is understandable and relatively manageable, but the anticipation of a merger or acquisition is much more complicated. Finding companies that are about to acquire most likely requires insight from the companies involved, which could be associated with major issues such as jurisdiction regulating insider behaviour for companies listed on stock markets.

The occurrence view is beneficial when the studied phenomenon is something other than the acquisition, but still being a phenomenon that, at least potentially, is related to the acquisition, whereas a process view is most likely used when the problematization is concerned with the merger or acquisition itself. The M&A literature cover a number of aspects with an occurrence view, and studies with an anterior approach could, for example, look into which companies are likely to acquire or to be acquired (e.g. Thompson, 1997), or the causes for M&As, for example the choice of the growth mode (e.g. Penrose, 1959). Due to the difficulty of knowing which companies that will be part of a future merger or acquisition, studies of *acquisition propensity* (cf. Wilson, 1980) are addressed in posterior studies to reflect past activities, but can be used for predictions in anterior studies.

Concerning the actual merger or acquisition, the occurrence of M&As are often treated, studied and understood as an aggregated phenomenon, and a substantial amount of research has focused on showing how many M&As occur (cf. Bushnell, 1961; Nelson, 1959; Rydén, 1971), for example, studied over time and analyzed with an origin in distinguishing different types of acquisitions. Mergers and acquisitions have been described as a mode of growth, and looking further into this, the direction of growth is a major issue (Harrison, 2003). Different types of mergers and acquisitions can be distinguished, referred to as acquisition strategies, and there are naturally different ways to describe the 'direction' of a merger or acquisition, although a commonly used typology is one credited to the Federal Trade Commission (FTC). The FTC typology is based on similarities in the product, technology or market of the consolidating companies and divides mergers and acquisitions into vertical, horizontal and conglomerates (Federal Trade Commission, 1968).

According to this typology, a 'horizontal' M&A takes place between two companies in the same industry, described as competitors (Larsson, 1990; Vaara, 1992) and can, for example, be made to reduce competition or to coordinate product

development (Larsson, 1990). If the M&A instead is made in line with a presumed value chain, i.e. merging with a customer or supplier, it is labelled 'vertical' (Larsson, 1990; Vaara, 1992). When acquiring a supplier, control of the resources the supplier is providing is gained, and similarly, distribution channels and market shares are internalised when acquiring a customer. Such integrations can be seen as defensive actions as the systematic risk is reduced through the secured access to resources. This could be especially important in situations with hard competition, but Thompson (1967) also describes vertical integration as closely related to the technology employed. The third category of M&A is 'conglomerates', which implies some level of newness to the company, either concerning markets, products or both. A merger or acquisition to an unrelated market, called 'market extension', means that the two companies are in the same general line of business, but are operating in different markets, which extends the business possibilities and lowers the risk. Unrelated product M&As, called 'product extension', means an extension of the business into another line of products, although somehow related in terms of marketing, distribution or sales. The product extension type could be furthered by distinguishing between technological and marketing relatedness regarding the products (Didrichsen, 1972; Hopkins, 1987). Finally, the 'unrelated conglomerate' is a situation where the similarities between the acquiring and the acquired firms are few (Federal Trade Commission, 1968).

Of these, the horizontal are, according to Rydén (1971), dominant with 80% of all M&A, whereas the Federal Trade Commission (1968) reports conglomerates to account for about 68% of the acquisitions. This has however changed over time (Nelson, 1959), and as time has passed since then, some believe that new types of M&As occur today, types which are not adequately captured by the FTC typology. One such example is the work by Bower (2001), which has attracted some support (e.g. Aguilera & Dencker, 2004; Cappelli, 2006; Ranft & Lord, 2002). It describes five distinct M&A strategies based on the challenge that the acquiring company faces, and acquisitions are thus the strategic activity that follows to handle the challenge. Whereas FTC categorizes individual M&As, Bower's typology rather describes a larger trend, based on the state of the industry or industries in which the merger or acquisition takes place. The M&A typologies are often used in aggregate studies where the number of different types of mergers and acquisitions is reported. Another use of M&A typologies, irrespective of the basis of it, is that the different types are likely to yield different results in a number of aspects, for instance the organization form after the M&A (Hopkins, 1987), the industry structure and entry barriers (Federal Trade Commission, 1968).

It is possible to approach the *outcome* of mergers and acquisitions with an occurrence view just as well as with a process view, but when the merger or acquisition is seen as an occurrence, the outcome is not explicitly related to actions taken in the process. What differs from the process view is thus that actions and parts of the M&A are of less interest, and the studied variable is rather related to the bare occurrence of a merger or acquisition. Roughly, the acquisition

performance can be described as the value achieved after the consolidation, in relation to the expected value before it, and the failure is thus that the anticipated gains do not appear (Chatterjee et al., 1992; Hunt, 1990; Lubatkin, 1983), which can be caused either by a badly handled execution or by unrealistic expectations (Cappelli, 2006). A more detailed definition of success is naturally dependent on which aspect is the primary focus and whose perspective is taken, but assessing the change, irrespective of the variable, is advantageously made by comparing the variable before (i.e. anterior) the M&A and after (i.e. posterior). Such variables could include the profitability, stock market value, market share or personnel competence, and the difference obtained could be compared to the change expected. Just as achieving an intended effect can be difficult, measuring such effects, and isolating other, interfering, issues, is not easy.

It is possible to use shareholder's value as a basis for evaluating M&A success, but this can be tricky to measure. A common approach has been to look at stock market performance (Trautwein, 1990), which naturally is only applicable to companies listed on the stock market. In the short run, the shareholders of the acquired company have been found to profit from the deal, but the long run results are not as promising (Cappelli, 2006; Perry & Herd, 2004). So, if acquisitions are made to increase the stock market value, they are not very successful, and that also goes for increased profitability in the form of excess returns (Gaughan, 2005; Pfeffer, 1972). Stock market value could thus be argued to be a bad measure of the success of either a company or an acquisition (Trautwein, 1990), and alternatives could be the turnover rate of management (Choi, 2001) or the retention of important customers. As mentioned, the occurrence view offers the possibility of comparing a variable before and after the merger or acquisition, and characteristics of the acquiring and acquired companies could thus be related to the occurrence or outcome of the merger or acquisition. However, not all aspects have to be discussed with a focus on the success of the M&A, and, for example, changes in corporate culture could be very interesting to study by comparing cultural dimensions before and after the M&A without necessarily evaluating the change (e.g. Chatterjee et al., 1992; Gertsen, Söderberg & Torp, 1998; Shrivastava, 1986).

Following the description of the treatment of mergers and acquisitions as either occurrences or processes, and if applying the same reasoning to bankruptcies, it can be concluded that when regarding mergers, acquisitions and bankruptcies as events giving rise to forces, it is the occurrence of them that is of interest whereas detailed parts of the process are not necessarily needed. This study thus treats mergers, acquisitions and bankruptcies as occurrences, not processes, which is an important positioning as it has implications on how they are handled in the data and analysis in the subsequent empirical study.

3.4 Mergers, Acquisitions and Bankruptcies in a Context

For mergers, acquisitions and bankruptcies to be events in the meaning of something that gives rise to forces, following the earlier definition, they must have a (potential) effect on the business network in which they occur. This means that they must not be seen in isolation, but rather in some kind of context, and what such a contextual view is based on can naturally vary. Examples of some views are given next, and similar to the earlier parts of this chapter, literature on mergers and acquisitions is emphasized. As the term ‘context’ has many different meanings, the apprehension and role of it naturally varies.

3.4.1 Mergers, Acquisitions and Bankruptcies in Different Contexts

Some consider mergers and acquisitions a way to control environmental uncertainty by internalizing activities and independencies (e.g. Thompson, 1967). This yields quite an interesting view of the context, with a strong managerial aim to control the surroundings in order to maximize the own benefits. It has been suggested that environmental interdependence can be dealt with in three different ways; absorb symbiotic interdependence, absorb competitive or commensalistic interdependence, or merger for diversification in order to reduce existing dependencies (Pfeffer, 1972). These thoughts were later supported and extended by Finkelstein (1997), and the perception of the context, and attitude towards it, is an interesting topic when having a contextual view. Mergers and acquisitions have a unilateral relation to the context, in the sense that they can both be influenced by, and have influence on, their context. Regarding mergers and acquisitions in different contexts does not address the context in itself as much as the view of it. This study will primarily base the grounds for exemplifying different contextual views on what makes up the context: other mergers and acquisitions, similar companies or related companies.

3.4.1.1 A Context of Other Mergers and Acquisitions

The recurrent designation of the studied situation as *turbulence* among IT-companies suggests that the mergers and acquisitions are a consistent phenomenon; consistent in both time and space. This supposed consistency can be viewed both from an individual M&A perspective and as an aggregate. To start with, one can look further into the connection between individual mergers and acquisitions. Öberg and Holtström (2006) describe “parallel M&As”, which are “mergers and acquisitions as a response to M&As among customers and/or supplier companies” (p.1268). This indicates a possibility that mergers and acquisitions are triggered by previous mergers and acquisitions (Haunschild, 1993), thereby causing a chain effect or “streams of acquisitions” (Kusewitt, 1985; Larsson, 1990).

Two concepts in the M&A literature that look at chains of M&As from a different perspective, addressing the occurrence of mergers and acquisitions as an aggregate, are ‘merger waves’ (Kusewitt, 1985; Mattsson, 2000; Town, 1992; Walsh &

Ellwood, 1991), and ‘merger movements’ (Du Boff & Herman, 1989; Hanweck & Shull, 1999; Nelson, 1959; Smythe, 2001; Weston, 1952). In short, they denote periods in time when an abnormal amount of mergers and acquisitions occur. Most of the motives described earlier do not provide a good explanation for the consistency in the occurrence of mergers and acquisitions, but some studies indicate a connection to, for example, changes in tax and competition legislation (Erixon, 1988; Rydén, 1971) and rise in the stock market (Rydén, 1971). Such explanations suggest that the contextual cause of the many mergers and acquisitions is some kind of change in conditions. A number of works on this subject describe the idea of merger waves. Rydén (1971) describes a powerful wave of mergers in the USA and Great Britain around the late 1880s, and claims that there have been three merger movements in the USA, one around 1900, one during late 1920s and one that was ‘still going on’ at the time of his study, i.e. 1971. Larsson (1990) continues the ordering, and claims that the fifth major merger movement took place in the 1980s, whereas others claim the fifth wave occurred in the 1990s and continued into the twenty-first century (e.g. Berggren, 2003; Bower, 2001; Weston & Weaver, 2001). The existence of merger waves is, however, not undisputed, which has led to some debate (e.g. Halbheer & Gärtner, 2006; Linn & Zhu, 1997).

When looking at the occurrence of mergers and acquisitions in aggregate, it might seem that most studies are relatively closely linked to an industry view. There is however, an important distinction between looking at M&A as a wave and seeing it as an industry change. A merger wave is identified as a relatively high amount of mergers and acquisitions during a certain period; illustrating an abnormal number of M&As per year. The abnormal frequency of mergers and acquisitions can perhaps be assigned to a certain type of companies, but that still differs from industry studies, which are also interested in variations in the M&A activity over time, but take their point of departure from a particular industry. An example of something in-between, namely a wave of M&A within a particular industry, is the ‘bank merger movement’ (Hanweck & Shull, 1999).

3.4.1.2 A Context of other Companies

Whereas a confined inclusion of actors focuses on a merging, acquiring or target company, and more precisely on some of the functions, resources or aspects of them, an extended M&A view takes an interest in more actors than those directly involved. Such additional actors can, for example, be customers, suppliers, owners and others. Although the coverage of M&A research is wide concerning aspects and stages, the research has been quite narrow in its actor inclusion. It has mostly focused on the consolidating organizations (Anderson, Havila & Salmi, 2001; Finkelstein, 1997; Holtström, 2003; Larsson, 1990) and left external actors largely neglected (Bocconcelli, Snehota & Tunisini, 2006). More precisely, the confined studies are often made from the perspective of the acquiring firm, but the target firm’s perspective is also considered in some studies (e.g. Calegari & Turetsky,

2006). There are naturally many interesting aspects of a merger or acquisition concerning the directly involved companies, and Trautwein (1990) even divides the company perspective into two levels, corporate and business, but never looks outside the company.

Some have however attempted to look beyond the organizational borders and include the surroundings of the companies. Of utmost importance to a company are its customers and suppliers, and some studies of mergers and acquisitions do include such actors (e.g. Anderson, Havila & Holtström, 2003; Anderson, Havila & Salmi, 2001; Holtström, 2003; Öberg, 2004). Furthermore, ownership is a factor that implies some power and control aspects, and should be hard to disregard. The ownership can however vary in its form; from a larger number of passive shareholders, mainly involved for the financial return, to a parent company highly involved in the business of its subsidiary. Another potential external influence is learning from experienced counterparts, which makes acquiring firms pay less for the target firm and, at the same time, makes the acquisition perform better (Beckman & Haunschild, 2002). Other types of actors in an extended M&A view can be actors that are not directly involved in the business of the acquirer or target company. Examples of such actors are legal actors dealing with competition issues that in some way have control over mergers and acquisitions, such as the U.S. Federal Trade Commission (FTC), or Swedish Competition Authority (cf. Handelsdepartementet, 1977; Konkurrensverket, 2002). Those authorities are assigned to enforce merger control as one part of their task to “promote effective competition”³, and if a merger or acquisition is judged to have a negative impact on the competition, it can be prohibited by the Swedish Competition Authority. Authorities of this kind can thus impact the target selection or the entire execution of a M&A, which makes them important to consider (Calegari & Turetsky, 2006; Larsson & Risberg, 1998), and some research has explicitly dealt with society’s control of company concentrations (e.g. Erixon, 1988).

The fact that the situation studied in this thesis has been described as turbulence *among IT-related companies* could be seen as a suggestion of an industry view. The connections between the acquisitions are in that case based on a similarity in the methods of generating profit, i.e. the products and markets of the involved companies. Changes in the structure of a particular industry, caused by mergers and acquisitions, is an example of a focus for industry studies, where also a low number of mergers and acquisitions in an industry is interesting and M&As are considered an important factor to understand industry development (Carr, 2000). There are quite a number of studies of mergers and acquisitions with an industry view, both taking interest in the product or technology relatedness, the industry structure, or simply issues within a particular industry (e.g. Adelaja, Nayga & Farooq, 1999; Finkelstein, 1997; Rydén, 1971; Shusterman, Norsworthy & Bessler, 2000).

³ The Swedish Competition Authority’s webpage, 2007-11-06:
www.konkurrensverket.se/t/Page_____481.aspx

Industry structure can be described in terms of the number of companies, the size, technology, sub-sectors etc. (cf. Baumol, 1982; Salant, Switzer & Reynolds, 1983; Woodward, 1965) When a merger or acquisition occurs, the industry structure is inevitably changed (Porter, 1998a), and the character of such a change, for example the intensity, can naturally vary. The industry-focused studies are wide spread, and include, for example, banking (Berger et al., 2004), construction (Tavakoli & Kefalidis, 1995), food (Adelaja, Nayga & Farooq, 1999; Reid, 2004), insurance (Carr, 2000), pharmaceutical (Higgins & Rodriguez, 2006; Koenig & Mezick, 2004), software (Gao & Iyer, 2006) and telecommunications (Amesse et al., 2004). Various aspects can be addressed, for example intra-industry effects from cross-border acquisitions (e.g. Otchere & Ip, 2006).

The literature using the quite common FTC typology (Federal Trade Commission, 1968), describing vertical, horizontal and conglomerate M&A is based on an industry perspective. What matters in this view are issues such as whether the two merging companies are classified within the same industry or not, i.e. if they are using the same technology, are involved in producing the same products or acts on the same market. Much of the literature on M&As has a confined inclusion of actors and is mainly interested in one, or both, of the merging parties. An extended view however adds a number of aspects, as other actors can be included in much of the reasoning on factors affecting, or being affected by, the merger or acquisition (Anderson, Havila & Holtström, 2003; Holtström, 2003; Larsson, 1990). The process does, however, not change when mergers and acquisitions are put in a wider context, which means that most of the issues that have been mentioned so far also are applicable with an extended view, however with a different set of actors and triggers in focus.

Just as with a confined set of actors, the motive is an important issue, and motives can also be found outside the directly involved firms. The business relationships of the target company may be part of the acquirer's motive (Bocconcelli, Snehota & Tunisini, 2006), which calls for the problematic inclusion of including the target's relationships in the valuation of the company (Kiessling & Richey, 2005). An acquisition can also be made to handle environmental uncertainty (Pfeffer, 1972; Thompson, 1967), or as Pfeffer and Salancik (1978, p.114) write: "Each merger has the effect of managing interdependence, though each is focused on a different form of interdependence and operates differently". This kind of cause can be related to economic disturbances that changes expectations and increases uncertainty (Trautwein, 1990).

The synergy-related discussion has a strong focus on the consolidating companies (Holtström, 2003), and many studies fail to recognize synergies outside the two merging companies (Larsson, 1990). The source of the potential synergy is, in such cases, the joint forces on the market (Ansoff, 1965; Goldberg, 1973; Malkoff, 1979), especially concerning coordinated purchases (Bocconcelli, Snehota & Tunisini, 2006). M&As can be deliberate actions to achieve market power, for example by using a powerful position in one market to support the entry into

another (Trautwein, 1990). M&A can also be made to limit competition both by reducing conflicts with existing competitors (Bocconcelli, Snehota & Tunisini, 2006), but also by deterring potential new competitors. These effects can be seen as collusive synergies, as no efficiency gains are accomplished, but the wealth is instead transferred from the customers. Not many merging parties explicitly state that they are aiming for market power, much because of the insolent meaning, and studies have neither been able to confirm the strive for monopoly (Trautwein, 1990). Rydén (1971) emphasizes differences in the fundamental economic assumptions; either by centring the attention on profit maximizing and assuming that strategic choices can be made from complete information, or by taking a greater interest in surrounding actors and viewing companies as complex organizations with limited information driven by other objectives than financial profit.

If taking a less deterministic view of management, it is possible to consider external factors and influences to be the causes of mergers and acquisitions. Requirements from customers and suppliers to enter a foreign market could be one such influence (e.g. Andersson, Johanson & Vahlne, 1997; Havila & Salmi, 2002), and pressure from shareholders to either do or avoid acquisitions could likewise be a relevant factor to consider (Wright et al., 2002). The motive for doing acquisitions can also be the desire to transfer wealth from the shareholders of the target company to the shareholders of the acquiring company. Such conduct has been criticised to be illogical, as the normal acquisition would require the acquiring party to pay the shareholders a premium price to gain control over the company (Trautwein, 1990). External origins for motives might not only apply to the acquiring company, but also to the acquired party.

The division into the acquiring firm's actions, and the target firm's reactions (Stahl & Sitkin, 2002) should in this approach be extended with a third point: the surrounding actors' actions and reactions. The integration of two companies is not undertaken in isolation from the surroundings of the companies, which means that the surrounding actors and influences must be incorporated into the integration process. Shareholders, suppliers and customers should be consciously handled, and that is not merely a question of dividing market segments between the consolidating companies. An elementary aspect of the considerations of surrounding actors during a merger or acquisition is communication. The importance of keeping the shareholders informed has been spoken for (Sirower & Lipin, 2003), but also the customers and suppliers should be informed, as they are of utmost importance to the company. The media is an important actor capable of affecting the attitudes of both the employees and the shareholders. The picture given of mergers and acquisitions by the media has shown not to be fully consistent with how managers perceive it (Hellgren et al., 2002), and the discourse produced by the media surrounding mergers and acquisitions has also been considered very adaptive, enabling opposing views (Tienari, Vaara & Björkman, 2003), thus calling for an awareness of the media's role.

Anticipating external effects in the outcome of mergers and acquisitions is very difficult as the acquiring and acquired companies are not the only ones involved (Bocconcelli, Snehota & Tunisini, 2006). Surrounding actors should however be included in the performance aspect, which sets the focus on those actors' perceptions or values. What defines success naturally varies, whether it concerns shareholders, a parent company, customers, suppliers, the media or the government. For an owner, success is probably closely related to increased financial returns or a rise in the share price (Gaughan, 2005), a customer might consider an increased quality to be a success, and a supplier perhaps sees increased orders as a positive outcome. Authorities with the responsibility of competition promotion are however probably more positive to mergers and acquisitions where as little coordination as possible is made in marketing and purchasing activities.

3.4.2 Applying a Business Network Approach to Mergers and Acquisitions

Given the business network view taken in this thesis, it is naturally relevant to regard mergers and acquisitions from a business network perspective. Whereas the concept of M&A waves suggests that the contemporary occurrence of mergers and acquisitions make up the context, and the industry view suggests that the similarity between companies is the basis for the context, the business network view sees a context of inter-related companies. Acknowledging business interaction between customers, suppliers and other actors explains how companies are connected to each other with a different basis for the reasoning compared to both the M&A wave and industry view. There is a clear difference in the role ascribed to the surroundings; profoundly based on the basic assumptions about companies and markets. The business network approach is a way to describe and understand the interaction between a company and the actors that are of importance to it, e.g. customers and suppliers. Although some of the existing M&A literature includes different market aspects, such as market power and marketing acquisitions (Lambrecht, 2004; Larsson, 1990; Nguyen, S ror & Devinney, 1990), customers and suppliers have largely been neglected in M&A literature (Anderson, Havila & Salmi, 2001; Homburg & Bucerius, 2005). Mergers and acquisitions can be performed to maximise the use of the market rules and functions (Larsson, 1990), but some have noted that market shares might not simply be acquirable; the target company's market share cannot simply be added to the acquirer's (Mueller, 1985; Ryd n, 1971). A different set of explanations related to the connection between mergers and acquisitions and the effects of them can be expected when applying a business network perspective, and through that, the field may be taken further.

When a business network perspective is employed, focus is moved from issues within the organizations to the business relationships of the merging companies, which means that slightly different aspects will be of interest. The integration of organizational systems is naturally of less interest than how the business relationships of the merging parties are handled and affected. A company's dependence on its relations to customers, suppliers and other actors that have

some kind of influence on the business of the company thus gets more focus. Some studies on the ending, or dissolution, of business relationships (e.g. Tähtinen & Halinen, 2002) are interesting to consider in situations with mergers, acquisitions and bankruptcies, and some business network articles include these kind of events in their empirical descriptions (e.g. Anderson, Havila & Salmi, 2001; Bengtsson & Kock, 1999; Havila & Salmi, 2000). At large, however, mergers, acquisitions and bankruptcies do not seem to have received a lot of attention in business network research, even though many different aspects of M&A should be relevant to consider from a business network perspective and the potential for finding interesting situations is quite large.

Two main affects can be considered: firstly, the possibility that the business network affects the merger or acquisition, and secondly the possibility that the merger or acquisition affects the business network. Mergers and acquisitions can thus both be a cause and a response to business network changes (Öberg & Holtström, 2006). Starting with **the effect of business networks on M&A**, it has been found that mergers and acquisitions can be affected by the relationships to customers and suppliers (Anderson, Havila & Salmi, 2001; Dooley & Zimmerman, 2003), and the business network aspect should be considered in all aspects, actions and phases of M&A. This means that the business relationships, and the actors that are of importance, should be considered in everything from the motive, the decision, the target selection, the integration, and the evaluation. Acknowledging the customers and suppliers sets a new focus, and naturally recognises other aspects of the merger or acquisition. The dominant managerial perspective in business research is, however, somewhat reluctant to include the troublesome context into the perception that managerial actions are what controls mergers and acquisitions (Havila & Salmi, 2002).

Strategies and choices must be approached differently when having a business network perspective, as choices must be made within the restrictions from, and uncertainty in, the context. The management's control over business relationships is not unilateral, so although some effects in the context can be intended and calculated, much is hard to comprehend and control (Anderson, Havila & Salmi, 2001) and a merger or acquisition is not entirely a management decision. It could be caused by the context, and thus be an outcome of earlier processes (Havila & Salmi, 2002), as it is historical and path dependent (Dooley & Zimmerman, 2003). All the attention to different, more or less rational, motives for M&A is questionable, and some have instead considered M&As to rather be the outcome of various influences (Trautwein, 1990), which is more compatible with the business network approach. Furthermore, the common FTC typology of different types of M&A, i.e. horizontal, vertical or conglomerate (Federal Trade Commission, 1968), is based on industry relations between the acquiring and the acquired firm. A similar typology, based on the business network idea, would probably take an interest in whether there was some kind of relationship between the two companies prior to the merger or acquisition, and if so, what kind of relationship it was

(Andersson, Johanson & Vahlne, 1997). Merging with a key customer might differ from merging with a less important, or even unrelated, counterpart, and this should be an interesting issue for future studies. If making this a target selection issue, it is thinkable that the companies, with which established business exists, are plausible objects.

Another issue, related to the target selection, is that not only is the target company bought, but also all business relationships of that company should be regarded as part of the target; “you marry the family”, as Dooley and Zimmerman put it (2003, p.57). Business network considerations in the integration phase are naturally just as important, but have hardly been addressed in M&A literature. Furthermore, the outcome and performance of the merger or acquisition must also be considered from the perspective of the actors that are important to the companies’ business, and highly depends on how well these actors have been included in the delicate task of merging two companies. If an acquisition causes the loss of important customers, it should probably be considered less successful (Anderson, Havila & Salmi, 2001).

Turning to the opposite causality, i.e. **the effect of M&A on business networks**, this idea is not considered in much of the literature. When two actors consolidate, which is what happens during a merger or acquisition from a business network perspective, it is reasonable to assume that their relationships to their respective counterparts are affected (Bocconcelli, Snehota & Tunisini, 2006). A merger or acquisition is thereby likely to affect not only the directly involved companies, but also other actors that are related to the consolidating parties (Anderson, Havila & Salmi, 2001; Holtström, 2003), and Havila and Salmi (2002) found that changes caused by M&A spread through connected business relationships.

The effect of mergers and acquisitions on business networks can be approached as either structural or relational changes, but just as the existing research on business networks is highly focused on a relational level, so are the few studies on M&A in business networks. From a structural point of view, an acquisition would imply a restructuring of the business network, but irrespective of the business network view, the joining of two actors through a merger or acquisition causes the joining of the actors’ network positions and the business relationships of the actors. The effects of such a change can be termination or development of business relationships, new structural formations or isolations, or it might stop at adjustments within the established business relationships. Bocconcelli, Snehota and Tunisini (2006) found substantially larger changes in the set of business relationships of the acquired company during the years following an acquisition compared to the periods before and after it. In their study, 20-80% of the acquired company’s main business relationships had been broken or replaced.

In a study by Anderson, Havila and Salmi (2001), a coordination of purchases was found, which, if the two companies were buying similar goods from different suppliers, means that one relationship to a supplier is terminated. Similarly, if the

two merging companies provide similar products, the customers will have their options reduced. Another effect was found when a customer to the studied company was acquired by a competitor, and soon thereafter ended its purchases from the company. They also describe less distinct connections, such as when a company bought one of its suppliers to complete its production line, whereby the competitors to the company, which were also using the now acquired supplier, questioned their trust and believed that they would be maltreated. The result was ceased purchases from the supplier, which naturally suffered economic losses uncounted for by the acquiring company.

It is possible that within the objective of an acquisition are parts that aim towards increasing control over the exchange relationships, affecting their character or affecting connections between relationships (Forsgren, Holm & Johanson, 2005; Johanson & Mattsson, 1992). However, of the effects from a M&A, only some can be intended and calculated while other probably are unexpected (Anderson, Havila & Salmi, 2001), and having strategic objectives concerning inter-connected business relationship is, however, most uncertain as network change is the result of several actors, which is not controllable by one actor (Havila & Salmi, 2002; Johanson & Mattsson, 1992). In their study of twelve acquisitions, Bocconcelli, Snehota and Tunisini (2006) found that neither the acquiring or the acquired company's management had considered the impact on their business relationships, and its effect on the outcome, at the planning of the acquisition. Recognizing and handling the effects on business networks, is an important aspect of successful M&As, but whereas the research of M&As applying a network perspective shows a clear effect on and from the relationships on the M&A, relationships to customers and suppliers are often not considered. This raises the question of whether the acquiring companies really buy the companies they think they do (Anderson, Havila & Salmi, 2001; Havila & Salmi, 2002).

3.4.3 Forces from Mergers, Acquisitions and Bankruptcies

Mergers, acquisitions and bankruptcies have, in this chapter, been described as events, but for them to be events in the meaning ascribed by the suggested force-based approach to business network change they must give rise to forces. The bare occurrence of a large number of mergers, acquisitions and bankruptcies does not make the turbulent situation well suited for studying business network change with the suggested force-based approach, but the condition for their relevance is that these events are likely to have an affect on their contexts. So in this study, mergers, acquisitions and bankruptcies should be considered from their potential impact on business networks; they must have an effect on business networks in order to meet the set requirements of being events that gives rise to forces.

As has been stated earlier, forces are conceptually separated from events; although the two are strongly related, they are not synonymous. Events, being the origin of the forces, are the bridge between actual actions and happenings, and the abstract concept of forces. An event can give rise to several forces of different kinds, and

similar forces can be caused by different events. The relation between events and forces will not be problematized further, but in line with the indications from studies of the effects of M&A in business networks, mergers, acquisitions and bankruptcies are believed to have potential effects on the business network in which they occur, and are thereby relevant to consider as events giving rise to forces in line with the suggested approach. When regarding mergers, acquisitions and bankruptcies as events giving rise to forces, the change of actors is used to get to the change of business network. Although it is not the change of a specific actor that is of primary interest from a business network perspective, but rather the effect it has on the business relationships in which the actor is engaged, how actors change over time may be a key to the issue of stability and change in business networks (Kjellberg & Andersson, 2005).

What is relevant when taking bankruptcies to a business network setting is that an actor disappears, regardless of the detailed legalities and formalities. As an actor disappears, the business relationships in which it is involved are naturally also likely to disappear, and from this study's business network view, bankruptcies are thus interesting as they cause change of the composition of the business network through termination of business relationships. Part a) in Figure 3.2 contains an illustration of this. Although situations can occur where the actual business continues despite the bankruptcy, this study will assume that a bankruptcy implies the disappearing of an actor and consequently also all business relationships involving that actor. Similarly, mergers and acquisitions from a business network perspective mean that two actors are consolidated. This has the result that two nodes in the network are joined, thus connecting business relationships that were not previously connected to each other, shown in part b) of Figure 3.2. Mergers and acquisitions consequently have an effect on the business network structure as they join two positions, creating a new actor with a new position, but it is also reasonable to assume that business relationships can be established or ended as the two companies are, for example, trying to achieve synergy in their purchases.

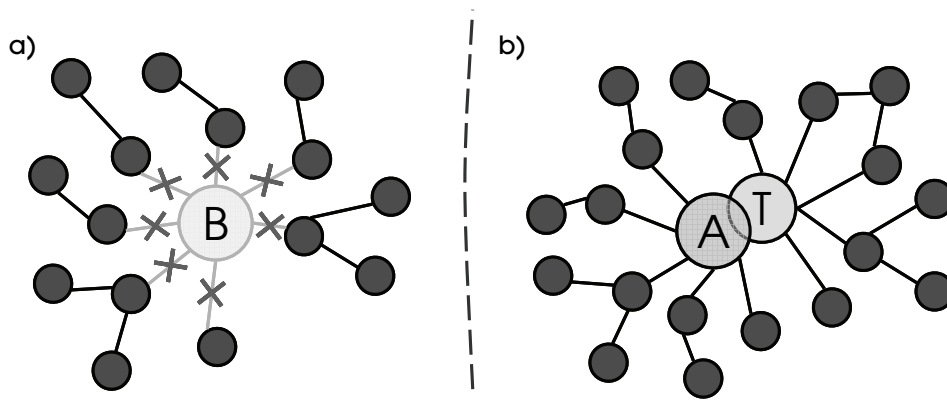


Figure 3.2 Mergers, acquisitions and bankruptcies in business networks
 In part a), the actor **B** goes bankrupt, which ends all its business relationships. In part b), actor **A** acquires actor **T**, which thus joins the two actors, their positions and business relationships.

As stated earlier, bankruptcies are not normally planned actions, which make it reasonable to assume that the business relationships of the bankrupt actor are likely to be terminated rather abruptly. In a planned closure, or consolidation through merger or acquisition, the business relationships can be gradually and premeditatedly terminated, and it has been suggested that some of the ‘energy’ in the business relationship even can be retained (Havila & Wilkinson, 2002). What kind of forces different events cause is an interesting issue to look further into, and offers an extensive research topic in itself, but from the considerations of the proportions of such an ambition, it will not be included in this thesis. Instead, it will here merely be assumed that mergers, acquisitions and bankruptcies are all origins of adjustive as well as radical forces (cf. Havila & Salmi, 2002). However, what makes these events especially interesting is their likelihood to yield a relatively radical set of forces, and the heterogeneity of the three types of events, regarding the radicality, will be returned to later, when the radicality component of the intensity dimension of business network change is described. There is thus an inclination toward the more radical type of forces in this study through its focus on mergers, acquisitions and bankruptcies, and this alignment has the effect that the forces are somewhat easier to apprehend. It naturally makes the studied situation an extreme case, not fully representative for how the business network change would appear if more diverse events, and thus types of forces, had been focused upon. The positive effect on the clarity of this tentative application of the force-based approach to business network change is however considered favourable enough to outweigh the desire to achieve a more balanced setting.

3.5 Mergers, Acquisitions and Bankruptcies Concluded

This chapter is the first of two that describes how the suggested force-based approach to business network change can be applied to the turbulence among Swedish IT-companies. The first step was to introduce ‘events’ as the empirically observable occurrences that gives rise to forces on the business network in which they occur. Events are, however, not equivalent to forces, and it is important to understand the difference between the levels; the notion of events is a “tool” to empirically identify something that theoretically can be seen as a force.

Consequently, mergers, acquisitions and bankruptcies are, in this study, seen as events giving rise to forces. Bankruptcies are of interest to business network change since they are likely to result in the termination of a number of business relationships as the actor disappears, which inevitably causes change to the business network. Perhaps not as evident as for bankruptcies, but mergers and acquisitions are also likely to have affect business networks, for example through initiated, altered or terminated business relationships, as two actors become one. The occurrence of this kind of events is thus the starting point of the identification of forces, and the suggested force-based approach’s explanation of wider changes as a coherent phenomenon is thereby believed to fit well with the seemingly turbulent situation among Swedish IT-companies.

Throughout this chapter, some of the vast amount of literature on mergers and acquisitions has been used to exemplify some of the researched aspects of M&A. Two dimensions, in which variations of research are distinguished, can be identified in the chapter: one is whether the merger or acquisition is treated as a process or occurrence and the other is whether the research takes a confined or extended set of actors into consideration. These two dichotomies form a four-field matrix, shown in Figure 3.3, in which articles, aspects and research traditions can be placed (see e.g. Haspeslagh & Jemison, 1991, App. B for another categorization). In short, it is believed that a major part of M&A research has been confined rather than extended in the inclusion of actors in the studies, and that it is more common to see mergers and acquisitions as processes than as occurrences. Such a matrix also enables this thesis to be related to the existing literature on acquisitions and mergers, which is considered relevant given the importance of M&A as an empirical phenomenon as well as research topic. It is important to note that the matrix does not address a categorisation of mergers and acquisitions per se, but of views and literature describing mergers and acquisitions.

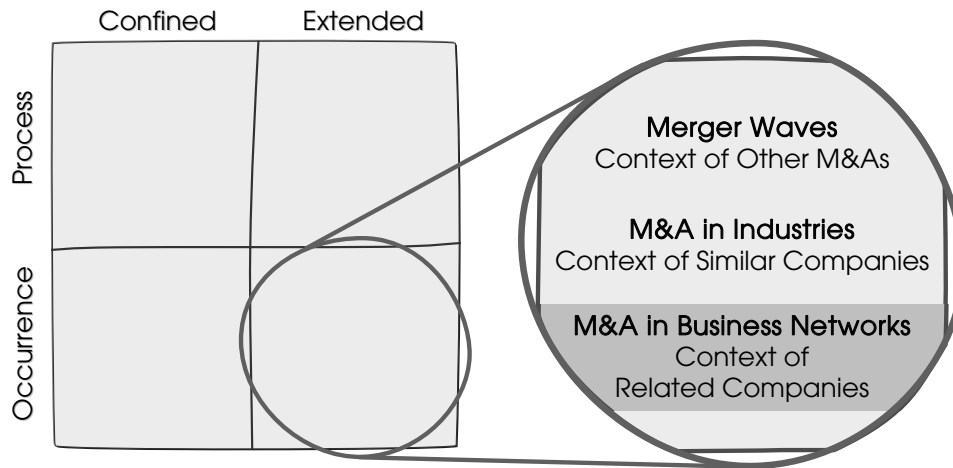


Figure 3.3 Categorization of M&A research and this study's relation thereto

This study treats the mergers and acquisitions as occurrences and has an extended inclusion of actors, which places it in the lower right quadrant of the matrix. The occurrence view taken in this study means that details of the merger process are not focused upon, but the M&A is rather treated as a black-box. Furthermore, the extended inclusion implies that not only the acquiring, bankrupt, merging and target companies are acknowledged, but also other related actors that are of importance to any of those directly involved in the merger, acquisition or bankruptcy. Whereas the literature examples in this chapter have mainly concerned mergers and acquisitions, the upcoming study also includes bankruptcies, and this chapter's M&A focus is because of its larger scope in terms of the literature available and its greater interest for management.

In the figure above, the occurrence-extended quadrant also contains two other views where M&As are seen as occurrences within some kind of wider context, which gives three different contextual views of mergers and acquisitions. The merger waves, which implies some kind of connection between the mergers and acquisitions in the form of a relative concentration of occurrences, is certainly interesting and could certainly be used to study the turbulence among the Swedish IT-companies. There have been articles written both arguing for and against the notion of mergers and acquisitions as a wave phenomenon, and that issue is surely promising to address in further research from various perspectives, but this thesis does not set out to study the turbulent situation as a wave phenomenon. Likewise, the industry view has been quite common in the extant body of literature on mergers and acquisitions, and it is naturally close at hand when studying a situation described as turbulence among Swedish IT-companies. The industry aspect is however not the focus of this thesis, and although the studied situation easily could have been described as *turbulence in the Swedish IT-industry*, the word industry has

been carefully avoided in order not to lead the thoughts of the reader into the industry view.

This chapter has shown that the context can be brought into M&A research in different ways, but behind this study is a strong interest in the dynamics of business networks, and the turbulence among Swedish IT-companies will here be addressed from a business network perspective through the suggested force-based approach to business network change. The business network perspective is believed to offer a credible description of the relatedness of companies that may be able to understand the contextual effect and dependence of mergers and acquisitions. The next chapter continues the specification of the force-based approach in relation to the studied situation. Whereas this chapter has described the level of individual changes, i.e. events and forces, the next chapter will focus on the business network change level and describe how the overall business network change will be assessed.

4 Assessing Business Network Change

Following the last chapter, this chapter will continue to apply the suggested force-based approach to business network change on the studied situation with many mergers, acquisitions and bankruptcies involving Swedish IT-companies. The turbulent situation will be studied as business network change, and the first steps were taken in the last chapter, where mergers, acquisitions and bankruptcies were described as events giving rise to forces potentially affecting business networks.

This chapter moves on by describing how the studied situation, with the mentioned events, will be studied as business network change, thereby concentrating on the business network level of the force-based approach presented earlier. The aim is to further specify the suggested dimensions describing business network change, in order to make them usable in the subsequent empirical study. Furthermore, preparations for the study are made by describing the delimitation of the studied business network change sequence and the levels of analysis that are used to capture the business network change.

4.1 The Studied Business Network Change

As a short repetition, the idea of the suggested force-based approach to business network change is that events give rise to forces that affect the context in which they occur, and these forces together form a change sequence. The occurrences of forces are thus the building blocks of the overall change, and business network change is, through this approach, studied as a sequence of forces rather than as alterations of a particular structure. Whereas the events and forces were addressed in Chapter 3, thus concerning individual changes, this chapter moves on to the business network change level where the changes are aggregated.

The affect of the forces was described in Chapter 2 as being moderated by some kind of stabilizing mechanisms within the business network. There was suggested to be a kind of inertia that moderates the effect of the forces, rendering some forces ineffective and other dampened. Variations in the inertia can perhaps be derived from the strength of the relationships or the extent to which the events were anticipated, which indicates some interesting characters of business networks. It is surely a topic highly relevant for furthering the knowledge on the functions and mechanisms of business networks, but it is not an easy task and this study will not explicitly look into the stabilizing mechanisms. Thus, although the stabilizing mechanisms are an important and interesting part of the suggested force-based approach to business network change, the following study will disregard it in order to make the study feasible. The result is that the forces caused by the events

unimpededly make up the resulting business network change sequence, similar to a situation where the stabilizing mechanisms are ineffective.

So, mergers, acquisitions and bankruptcies are considered to be events that give rise to various forces, and as the stabilizing mechanisms are disregarded, these forces together constitute the resulting business network change sequence. For the empirical study, this means that the occurrence of mergers, acquisitions and bankruptcies are used as a proxy for forces and together these events can be used to describe a business network change sequence, which makes it quite manageable to get to the business network change. What is obtained is, however, not a complete change sequence of the business network, as there are many forces that are not captured by the focus on mergers, acquisitions and bankruptcies, but it provides a change sequence related to these events. All the simplifications of the force-based approach to business network change that have been stated in these last sections is on one hand a degradation and loosening of the approach, but on the other hand it is what makes a study at this early state of the approach possible. Enabling a tentative application and explorative testing of the force-based approach, through which appropriate adjustments of it can be made, is an important basis for this study.

An important feature of the suggested force-based approach was to enable business network change to be described, so an important part of the approach was the suggestion of dimensions and indicators to describe business network change. The primary objective of this chapter is therefore to specify these indicators and dimensions in relation to the studied situation. Before doing so, a very important issue remains, namely the definition of the business network in which a change sequence will be described, which sets the scene for the subsequent specification of how the describing dimensions will be applied. However, the studied business network change must be captured in order to be described, and this chapter will therefore suggest the use of 'event-centred network elements' as a way to capture the contexts of the forces originating from the studied events. The study will contain analysis of a business network change sequence, which to some extent is performed through event-centred network elements, and this section will describe these levels and the relationships between them further.

4.1.1 The Changing Business Network

From the declaration of this study's view of business networks, found in section 2.3.3, it is clear that the changing business network, in which a change sequence is studied, is an excerpt of the hypothetically worldwide business network. Some kind of delimitation is necessary to enable studies of business network aspects, and furthermore, it is important to remember that business networks are conceptual objects, not physical, so the identification and delimitation of business networks is always an analytical issue. This section will describe the basis of the delimitation of the business network addressed in this study, referred to as 'the Swedish IT-related

business network', thereby making clear which business network the change sequence represents.

As the focus is set on the turbulent situation with many mergers, acquisitions and bankruptcies involving Swedish IT-companies, this is the basis of the delimitation of the business network focused in this study. Therefore, the starting point is to include the Swedish IT-companies, which are involved in one or more merger, acquisition or bankruptcy. All mergers and acquisitions need not be a combination of similar companies, so M&As that are made between a Swedish IT-company and another type of company are also included. These companies, and events, however become more interesting if other companies, to which they somehow are related, are included as well. This means an extension of the addressed business network to include actors related to any of the Swedish IT-companies involved in the events. So, besides the actors and direct involvements in the studied events, different types of relations are an important part of the Swedish IT-related business network. These relations include both business relationships, as described in section 2.1.1, and other inter-organizational ties, such as ownership and partnership relations.

Whereas at least one of the actors in the event was required to be both Swedish and IT-focused, these related actors can be of any nationality and in any line of business. An IT-system, for instance, can be used by all types of companies, and this 'IT-related business network' is thus not focused on value-adding chains or competitive actors within a certain line of business, but is highly based on linkages between various lines of business. Although somewhat similar, this is to some extent different from other studies on M&A in business networks (e.g. Dubois & Gadde, 2002; Havila & Salmi, 2000) because of the many linkages to other sectors. The business network in which a change sequence will be described in this study is thus based on Swedish IT-companies and actors that are related to them or are involved in an event together with them. This means that a number of sets of actors, centred on a merger, acquisition or bankruptcy and joined by different relations are obtained, and each of these can be seen as a small network, which is described in the next section as a network element.

4.1.2 Event-centred Network Elements

When describing the resulting business network change sequence, the analysis will concern the delimited Swedish IT-related business network. However, in the quest to describe the overall change, details can be added by looking into smaller parts of the network, revealing characteristics of the events and the parts the forces impact. As has already been brought forward, mergers, acquisitions and bankruptcies involving Swedish IT-companies are here seen as events that give rise to forces that in turn have a potential effect on the business network, and for the sake of simplicity, these events are equated with forces in this study.

Unlike much of the literature on mergers, acquisitions and bankruptcies, the point of this study is to widen the view by not only including the directly involved companies, but also the immediate context of the events, i.e. those actors that are

related to the directly involved companies and thereby are likely to be affected by the event. Figure 4.1 below illustrates how this turns out, in the case of an acquisition. Besides the acquiring company and its target (shown as A and T), a number of other companies, related to the directly involved actors, are included. These are, for example, customers and suppliers of the acquirer or the target (denoted C & S), or any other company that is of importance to the acquirer or target (denoted O in the figure). This extends the events to become situations that include other companies whose business potentially is affected by the acquisition. The result of this widened view is that instead of seeing an acquisition as something that involves two companies, an acquisition is seen as a situation that involves several actors. This extended view of M&A is somewhat different from the traditional M&A research and thus has the potential to give a different apprehension of such events. Likewise, bankruptcies are not seen as only involving one company, but also such events are likely to affect other companies, which therefore are relevant to consider as being part of the event. The interesting aspect of this wider view of the events is, however, not an extended number of companies, but rather the situation as a unit. This view acknowledges the settings of the events, and thus enables a richer understanding of the impact of it, so the analysis can thus be made of the events in their immediate context.

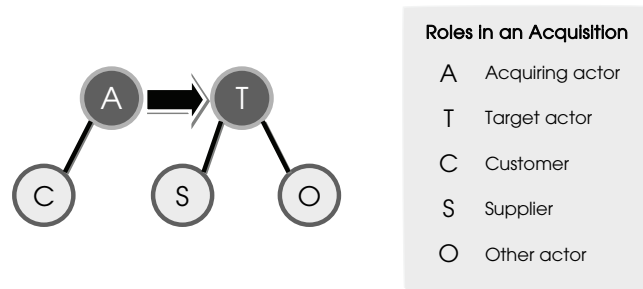


Figure 4.1 *A wider view of an acquisition*
Exemplification of other roles than the directly involved acquiring and target actors. This wider view forms the basis for the contextual view of the events.

From a business network point of view, this sets the focus on sub-networks surrounding the events. These sub-networks represent the changing parts of the business network, and emanate from the occurrence of an event. When working with large networks, reducing it by extracting cores, cliques or islands is a central part of the analysis according to social network analysis literature (de Nooy, Mrvar & Batagelj, 2005), and there have been some suggestions on how to address parts of a business network, based on different grounds. Lundgren (1995) describes ‘blocks’, which are subsets of the business network within which the actors are “connected more to each other than to other actors outside the block” (p.118), and similarly, Iacobucci et al (1996) identifies ‘cliques’ due to their interconnections.

Another approach is ‘nets’, which are sub-networks of a limited number of interrelated actors (Hertz, 1998) and can be identified, for example, through the strength and character of the relations between actors (Easton, 1992; Hägg & Johanson, 1982). Salmi (1995; 2000), on the other hand, uses the term ‘focal net’ to denote an extracted set of business relationships that a focal actor perceives as important. It thus originates from a specific actor, and has some resemblance to both ‘network context’ (Thilenius, 1997) and ‘ego-centered networks’ (Wasserman & Faust, 1994). ‘Focal nets’ are largely based on a focal actor’s perception of its context, and have a strong connection to the data collection phase. ‘Blocks’ and ‘cliques’ are, however, more directed towards the analysis than the data collection, as these approaches look for parts of a known business network that can be distinguished due to some specific character, e.g. a relatively high density. This is certainly a valuable approach to finding important, or at least special, parts of the studied business network, but it sets great requirements on the completeness of the information about the business network in order to become truly useful.

In the work preceding this doctoral thesis, the concept of ‘network elements’ was introduced as a way to address parts of business networks in the analysis of larger business networks (Dahlin, 2005). Doing so means that a part of the large business network, for some reason, is extracted, analysed and treated as a structure in itself. The network elements are parts of the larger business network, and although they are not independent units, they are valuable to analyse as such. As said, network elements have an analytical purpose, and it is the purpose of the analysis that decides what the basis of the distinction of business networks are. Network elements can thus represent clusters or categories reflecting, for example, a relatively high density in the interconnectedness of the actors, or some specific character of the actors, and can in such cases be quite similar to ‘blocks’ or ‘cliques’. In this study, changes in the form of mergers, acquisitions and bankruptcies are in focus and the network elements are used to frame the changing parts of the studied business network. Consequently, around each of the studied events, a network element will be extracted, including the actors directly involved in the events, i.e. the bankrupt, merging, acquiring and target actors, but also all actors related to any of these, for example being a customer or partner of one of them at the time of the event. The network elements are thus centred on an event, and thereby have some resemblance to the ‘focal nets’. However, network elements primarily have an analytical purpose, aimed at enabling analyses of subsets of the business network where forces have a potential impact. An event-centred network element is thus a “tool” to handle the immediate context of a force in the empirical study of mergers, acquisitions and bankruptcies.

The network elements in this study will be extended to include actors and relations one step out from the actors that are directly involved in the event. Depending on the data collection, different coverage will be obtained, but the completeness of the extracted network elements will probably always be a matter of compromise. The point is, however, that with an interest in business networks as structures, i.e. with

another focus than understanding the details, 'incomplete' network elements can be used to learn about the larger network and the events occurring within it. The event-centred network elements, extracted from the studied business network based on the occurrence of an event, are, based on the earlier definition, part of the same larger network. This means that they are assumed to be interlinked structurally and temporally, which is not the primary focus of the network element level analysis, but indeed an interesting aspect. The structural coherence means that the network elements are parts of the same larger business network and the temporal coherence means that as time passes, the structure is changed and connects parts that earlier were separated. Seen together, the event-centred network elements give an understanding of the studied business network, and particularly of the parts where the forces occur, based on the events, and this is the main idea of using them as a tool in the empirical study.

Being the context of the studied events, the changing parts can, for example, be described in terms of the composition of different actors and their characteristics. Business networks are believed to be heterogeneous in the sense that different parts of the business network can have significantly different characteristics, and what characterizes the changing parts of the studied business network can be addressed through the immediate contexts of the events. In order to obtain a greater level of detail, part of the analysis will focus on individual actors, namely the companies that are directly involved in mergers, acquisitions and bankruptcies or those who are related to any of the directly involved companies. The actor level is a further concretisation of the studied situation and a continuation of the decomposition of the changing business network. On this level, characteristics of the actors are addressed, for example the size, nationality and type of product. The actor level thus contributes with an understanding of which actors that are involved in the events, their frequency of involvement, and which roles they have. The actors, seen as individual units, contribute to the analysis of the event-centred network elements by adding nuances of their composition.

The extraction of network elements, defined by the occurrence of events in the form of mergers, acquisitions and bankruptcies, enables the analysis to describe which parts of the business network the forces act upon. By doing so, more details on the changes, their location and potential impact can be addressed, which will be returned to in the subsequent sections on how the intensity and extension can be assessed. The idea of analyzing the studied IT-related business network through event-centred network elements is, in conclusion, to be able to describe the details of the parts of the network where the events occur and thereby get to the contextual extension of the studied business network change sequence.

4.1.3 A Structure of Inter-linked Network Elements

Although the main focus is to describe a business network change sequence within the Swedish IT-related business network, the event-centred network elements are an important means to getting there. Defining the unit of analysis can be a

troublesome issue (cf. Pentland & Feldman, 2005; Reimers, Johnston & Klein, 2004; Silverman & Solomon, 1998), but in this study, analysis will primarily concern network elements in different ways. The same set of data will be used and there is a close interaction between the different levels of abstraction (cf. Levine, 1996; Ostroff & Harrison, 1999). The whole point of this procedure is to get to the complex business network change both in detail on a lower level and at an aggregated level. The business network concept is very abstract, and approaching it in different levels is a reoccurring approach and discussion (Henders, 1992). An example of this is Hertz (1998), who described four levels: single organization, relationship, net and total network. The different levels have by some been labelled micro (dyad), meso (net) and macro (total network) (Henders, 1992), and have also been included in studies regarding change (Hertz, 1998).

In this study, the network element analysis enables an understanding of the individual events and forces, but also of the contexts of the events in the form of the involvement and roles of the actors. The network elements are closely related to the studied business network change sequence, as the analysis of event-centred network elements together build up information and enable the analysis of a business network change sequence. More specifically, event-centred network elements form a business network change sequence based on the linkages between these network elements in time and structure. The left part of Figure 4.2 illustrates a number of network elements, i.e. sub-networks that are centred on a merger, acquisition or bankruptcy and that include actors that are either directly involved in the event or related to a directly involved actor. These network elements can be linked either through an overlap, i.e. two network elements include the same actor(s), or through relations in one or more steps out from the event. Through these kinds of linkages, it is possible to connect the event-centred network elements to form a business network like structure, also shown in Figure 4.2. The close interaction between the levels is thus considered to be a prerequisite rather than an obstacle for the analysis (cf. Reimers, Johnston & Klein, 2004).

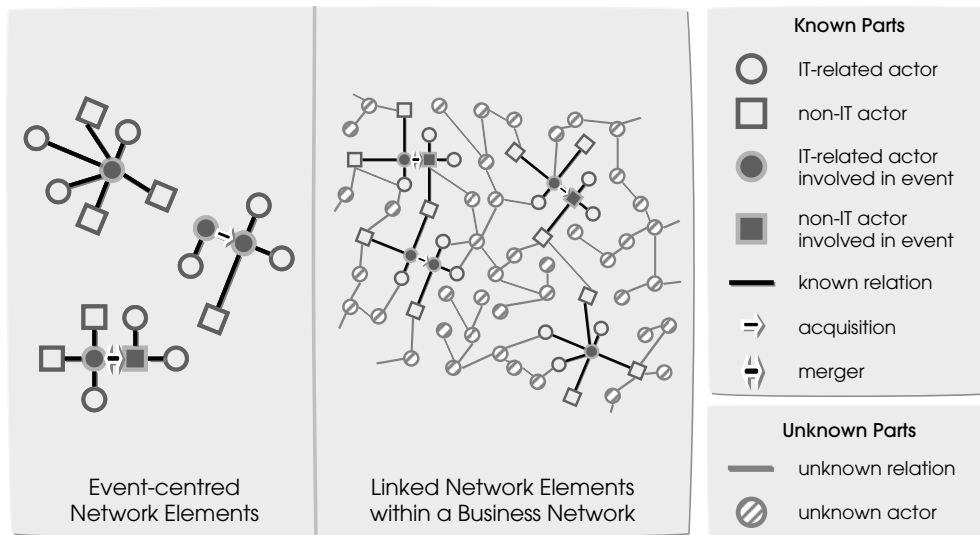


Figure 4.2 *Linked network elements within a business network*
 Event-centred network elements are structurally linked within business network.
 The illustration also shows known and unknown parts of the business network.

A large number of event-centred network elements can be obtained from the inclusion of a large amount of mergers, acquisitions and bankruptcies. With more network elements, and a higher degree of inter-linkages, the captured structure moves towards resembling the defined Swedish IT-related business network. What can be discovered through this approach are the actors that are directly involved in mergers, acquisitions and bankruptcies, or are related to any of those, but large parts of the studied business network are likely to be unknown. All events, relations and actors will not be captured, and all the linkages between the parts that are known will neither be known. This is also illustrated in Figure 4.2, where many of the parts of the shown business network are marked as 'unknown'. Similarly, some parts of the Swedish IT-related business network are known in this study, whereas other parts are not. Some literature describes how the affect of missing data on structural measures in network analysis can be dealt with, i.e. when only parts of the studied network is captured (e.g. Costenbader & Valente, 2003). This study's incompleteness of the network data is, however, a rather natural fact considering the pursued approach to business network change. As was discussed in section 2.4, this study of business network change will benefit more from focusing on the changing parts than the parts that do not change, which is the result of this change-favouring inclusion. Instead of trying to cover the entire Swedish IT-related business network, the suggested force-based approach sets its focus on the parts that change, through the analysis of event-centred network elements. These network elements, being the immediate context of the events, are used to describe the character of the change of the studied business network change sequence, and the remains of this chapter will specify how the suggested dimensions describing

business network change will be used in the study of mergers, acquisitions and bankruptcies involving Swedish IT-companies.

4.2 Assessing the Intensity

All the forces affecting the business network over time together form the process of development of the business network, referred to as a business network change sequence. Due to the simplifications made for this study, events are used to get to the forces, and what will be studied empirically is thus a sequence of events reflecting a sequence of forces. The events occurring within the borders of the Swedish IT-related business network, more precisely mergers, acquisitions and bankruptcies, are aggregated to represent business network change in a part of the analysis. However, to get there, other parts of the analysis will consider the events and involved actors as separate units in order to build up more detailed information about the business network change sequence.

The actual analysis will be highly tentative in its procedure, but this and the following sections will aim at giving indications of how the dimensions describing business network change will be applied to the studied situation, using the occurrence of mergers, acquisitions and bankruptcies. The tentative performance of the analysis means that some aspects might show to be less useful or manageable, which is seen as a part of the evaluation of the force-based approach. An obvious issue in this preparation of measurement dimensions is whether the dimensions describing the business network change should be continuous scales, ordinal scales or nominal categorizations. The difficulty of setting distinct values on variables in social science is naturally a factor, which, together with the relativity of most measures, speaks in favour of categories, although continuous scales, or at least multi-nominal scales, offer the possibility to make wider categorizations at a later stage. As will show, a mixed set of scales will be suggested in this section.

4.2.1 Amount

The amount is a rather self-explaining indicator of business network change intensity. It largely addresses the number of forces, which in this study are represented by events, i.e. mergers, acquisitions and bankruptcies. It is based on the belief that many forces causes more change than a few, if keeping the type of forces constant, and the range of the amount could simply vary from 0 to ∞ (infinity). The amount of forces is easiest to value if set in relation to something, for example, the size of the studied business network in terms of number of actors. The relativity of the amount can also be approached by comparing the amount of forces between several periods of time or situations. The amount indicator thus needs to be combined with the two other suggested indicators of intensity.

4.2.2 Temporal Concentration

The temporal concentration shows whether the forces are concentrated, i.e. a large portion of them occur during a relatively short period of time, or if they are spread out, i.e. they take place over an extended period of time. The underlying assumption is that continuous change is different to change occurring at a single occasion, and with the force-based approach to business network change, this reflects how spread or concentrated the forces are over time. The temporal concentration of the forces, in this case in the form of mergers, acquisitions and bankruptcies, can be approached and shown in different ways, and this description will be kept rather basic.

In essence, a high temporal concentration means that a large part of the included forces takes place during a small part of the studied period. As this indicator of the intensity of business network change addresses the distribution of forces over time, the first and most elementary measure to calculate is the frequency of forces per period. This is a relative measure comparing the individual periods, but the frequencies can also be used in aggregate, as the variations in the frequencies describe the evenness and distribution of the forces over time. A high concentration, which is one end of this scale, indicates that there are relatively few periods with a high frequency compared to the rest of the periods. A low concentration, on the other hand, reflects a uniformity of the frequency distribution. This will be further explained using two aspects: the peaks in the frequencies and the variations in the frequencies.

To start with, a concentration in certain periods is one aspect of temporal concentration. This is addressed by looking for periods with a relatively high frequency, called 'peaks'. A peak is here defined as a consecutive set of time periods being either above or below the mean frequency value. Two characteristics of peaks are given from this definition: a peak has a 'height' and a 'length'. The height will be returned to later, but it is important to notice the use of the mean frequency value to delimit the peaks. The length of the peaks is directly related to the number of periods included in the study and the number of peaks. The number of peaks could, theoretically vary from two to the number of periods included; only one peak is not possible given the definition of peaks. The maximum number of peaks, implying constant alterations around the mean value, means a lower temporal concentration, whereas fewer peaks mean a higher concentration of the forces in time. Especially interesting are the peaks that are above the mean frequency value, i.e. contains a relatively high amount of forces.

The basic idea behind the temporal concentration means that the fewer periods the forces are concentrated to, the greater the temporal concentration, so a small number of peaks above the mean value increases the temporal concentration, and these few peaks should also be as short as possible. Concerning the height of the identified peaks, this can be assessed through the variation in the frequencies. The definition of peaks related the different frequencies to the mean frequency value,

and the variation is the size of the peaks' fluctuations around the mean value. Small variations around the mean frequency imply evenness, i.e. a low temporal concentration, whereas large fluctuations intensify the concentration, and quite natural, with a given number of forces, the fluctuation is greater with a fewer number of peaks.

Returning to the initial statement, that a high temporal concentration means that a large part of the included forces take place during a small part of the studied period, the greatest temporal concentration is obtained when all the forces are found in one period, i.e. there is one peak of one time period's length, which also maximizes the variations in relation to the mean frequency. The peak-identification approach has been inspired by the 'cuts' and 'islands' concepts in social network analysis, which aims at identifying peaks in some character of vertices or edges (Batagelj, 2003; Batagelj & Mrvar, 2006; Batagelj & Zaveršnik, 2004). Using this resemblance, each period can be considered a potential hill and the frequency at each period is its height. This topography is then lowered into water, until the water surface is at the level of the mean frequency. Each above-mean frequency peak will now be visible above the water, it will be an 'island', and in a situation of maximum temporal concentration, one narrow but very high island will rise out of the water.

This description of temporal concentration as a combined assessment of the variation and the number of peaks forms a four-field matrix, depicted in Figure 4.3 below. The horizontal plane of this matrix describes the variation as being either high or low, whereas the vertical plane divides the number of peaks into many and few, and each quadrant contains an (exaggerated) illustration of the distinct situations. In this figure, the frequencies are depicted as curves by joining each point representing the frequency of a period with the subsequent period's point through a line. This makes the peaks appear clearly, delimited by intersections between the obtained frequency curve and the line representing the mean frequency.

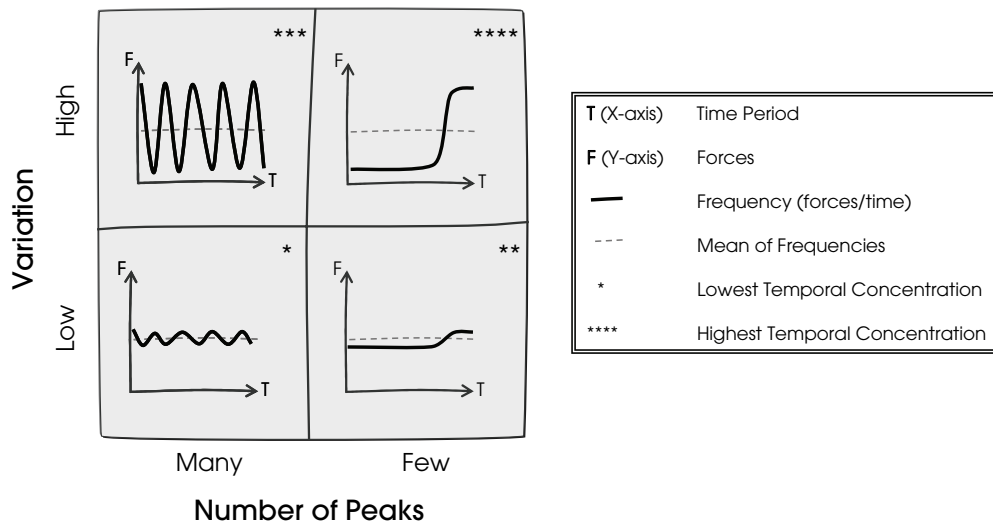


Figure 4.3 Four field matrix describing Temporal Concentration
 The temporal concentration is approached as a combined measure of the variation and the number of peaks.

Whereas also a numerical analysis and measure will be attempted in the analysis stage, this figure with its quadrants can be used as the basis of a qualitative assessment. The variation is in the figure considered to be the primary indicator of temporal concentration, thus being the ultimate divisor between high and low temporal concentrations, whereas the length of peaks adds important details to the dimension. So the order is that a situation with low variation and many peaks is considered the lowest temporal concentration (marked *) as it contains a continuous and small oscillation around the mean frequency. Second lowest temporal concentration (marked **) is a situation with low variation but few peaks, which means a small variation from the mean, but shows a clear distinction between different periods, dividing the situation into one slightly more changing period and one more stable period. Second highest temporal concentration (marked ***) is obtained in situations with high variation and many peaks, i.e. a fast alternation between high and low peaks. Despite the large variations, the short length of peaks makes this a relatively continuous alternation, which reduces the temporal concentration. The maximum value of temporal concentration (marked ****) is consequently obtained in situations where the variation is high and the peaks are few. This means a sharp distinction between a few sets of periods, which makes the change unevenly distributed, and thereby concentrated.

4.2.3 Radicality

The radicality indicator of the intensity of business network change was, in section 2.9.1, described as reflecting the character of the forces making up the change. The forces were described through a dichotomy of adjustive to radical types, and

building on this, the used scale of radicality extends from a situation of only adjustive forces to a situation of only radical forces, with a sliding scale in between. The radicality thus shows how large a share of the total amount of forces is composed of adjustive and radical forces respectively. The extremes of this scale, representing situations with only one type of force, is perhaps not entirely likely to occur, as also the more radical types of events are likely to result in adjustive forces besides the radical type. Instead, a range between mainly adjustive to mainly radical might be more likely, but nonetheless, it reflects the distribution among the types of forces.

Assessing the character of the forces is, however, quite complicated, and as the events are the observable phenomenon, the radicality must be judged based on the events. One approach could therefore be to look at some specific events, and ascribe them certain characteristics. The empirical phenomena in this study are, as declared, mergers, acquisitions and bankruptcies, which are considered to give rise to both adaptive and radical forces. However, what distinguishes these events is their relatively high content of radical forces. All three types of events are considered to challenge the existing business network structure. The actual impact of these different types of forces should be judged from the effect of them, but that is beyond the scope of this study, and the radicality of the different events are merely assumptions, which is a significant simplification of the force-based approach. It does seem relevant to distinguish between mergers, acquisitions and bankruptcies, and Figure 4.4 below shows the three types of events placed in a scale illustrating how this can be apprehended, where the leftmost end of the figure is the least radical, thus containing only adjustive forces, and the rightmost is the most radical with only radical forces. This assessment scale can be used for single events as well as entire situations, i.e. the events in aggregation. Note that the actual placements of the events should be assessed by further research, and the use of these assumed characteristics of the events is rather the relative order among them.

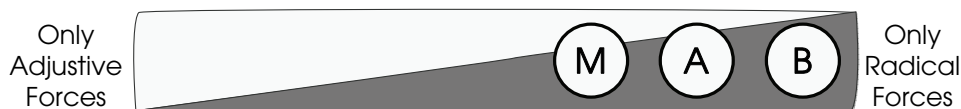


Figure 4.4 Indication of the radicality from different types of events
Mergers (M), acquisitions (A) and bankruptcies (B) shown in a scale describing the radicality of business network change, ranging from only containing adjustive forces to only containing radical forces.

Mergers, acquisitions and bankruptcies are expected to cause rather strong effects as, for example, business relationships ends or positions are consolidated. All three types of events included in this study are thus considered to have a considerable portion of radical forces, but mergers are positioned as the least radical, and bankruptcies as the most radical of the three. This order can be discussed, but the mutuality of mergers is behind the assumption of a relatively low radical content of

such events, whereas bankruptcies are both unwanted and rather definite, which increases their radical content. Each of these types of events could naturally be explored in more depth, and they are in themselves not homogenous. Different strategic intentions, activities and challenges can be found within each of these event types (Bower, 2001). Consider, for example, a partial acquisition compared to a full acquisition, or a hostile takeover compared to a target-initiated acquisition. However, regardless of the details, the relative order of the three events will be used as an indicator showing variations in the business network change. Each type of event can thus be placed in the figure, but the events can also be used in aggregate to obtain a position describing the radicality of the entire studied situation.

4.3 Assessing the Contextual Extension

Whereas the intensity dimension of business network change concerned the amount, temporal concentration and radicality of the forces, the contextual extension describes how large share of the business network that is affected by the forces. This is based on the characteristics of the immediate contexts of the forces, addressed through event-centred network elements. More precisely, the contextual extension dimension concerns whether the forces are spread or concentrated in the business network, and the obvious question is how this is assessed. When the contextual extension dimension was introduced in section 2.9.2, three aspects in which the contextual extension can be assessed were suggested, based on individual actors, structural positions and actor categories. Constructing scales that reflect these aspects, and cover the possible spread in them, makes it possible to place forces according to the scale, and thus also to analyse the spread of occurrences of forces within it. So, a scale or a number of categories is needed, in which the forces can be placed depending on their point of impact. Then, the contextual extension of these forces can be assessed by looking at how much of the scale is affected by the change. To assess the contextual extension of the change at a business network change sequence level, analysis at a network element level is required.

4.3.1 Actor Extension: Spread over Individual Actors

Considering the concentration of forces to specific actors is, perhaps, the simplest form of indicator of the contextual extension of business network change. The basis for this indicator is each actor's frequency of involvement in the forces, which in this study are represented by the mergers, acquisitions and bankruptcies. So, by counting the number of times a company is involved in an event, a measure of its involvement frequency is obtained which reveals which companies, for example, are the most frequent acquirers. As has been made clear earlier, the involvement in mergers, acquisitions and bankruptcies is in this study not limited to the bankrupt, merging, acquiring or target roles, but also includes actors that are related to any of these directly involved actors, such as customers, suppliers or others (see e.g. Figure 4.1). Judging the involvement frequency is thereby more rewarding if

consideration is taken about the number of involvements in the different roles. The primary judgement of the actor extension will reflect the degree to which the forces are spread over different actors. A high actor extension thus means that the forces are spread over many actors whereas a low actor extension implies a concentration of the forces to a few actors.

For natural reasons, the numbers of involvements in the different roles have quite different conditions. Whereas third party involvements can be quite frequent but have a limited affect on the company, the target role, at least when the target company is fully absorbed, could be limited to occur only once and have a major affect on the company. Chapter 3 described mergers and acquisitions as actions, made by companies with a strategic aim, and there are many different motives for a company to choose to grow through acquisitions, some of which were mentioned in the previous chapter. Although the reasons behind the decision to acquire are not the primary focus of this thesis, a frequent acquiring will show in the involvement analysis of the actors. The actions and reasons, e.g. choice of mode, speed and direction of growth (Lu, 2006), are shown in forms of different merger and acquisition behaviour (Ansoff, 1971; Appelbaum, Gandell, Shapiro et al., 2000; Appelbaum, Gandell, Yortis et al., 2000; Hunt, 1990), and part of this behaviour is the frequency of performing acquisitions, sometimes labelled acquisition propensity (Amihud & Lev, 1981; Wilson, 1980). However, just as one can look at which companies are acquiring others, one can also look into which companies are acquired. The latter question sets the focus on the target companies, which surely are interesting, although being acquired is not necessarily a deliberate action taken by the company, consider for example hostile takeovers (Franks & Mayer, 1996; Hirshleifer & Titman, 1990; Pearce & Robinson, 2004). Note however that a propensity to acquire does not exclude the possibility to be acquired, and the other way around; these are two different dimensions. However, if concentrating on the acquisition propensity, it is reasonable to assume that some are involved in more acquisitions than others are. Companies with a relative high frequency of involvement could be metaphorically described as 'sharks' (cf. Arbel & Woods, 1988; Roberts, 1999) with a large appetite for 'baits', i.e. smaller and vulnerable or just very tasty fishes (Bower, 2001).

There are thus some companies that are more frequent in their acquiring than others, and identifying, or at least describing these has naturally been an interesting question for some research. It is perhaps natural to relate the acquisition propensity to the size of the companies since undertaking an acquisition is quite demanding in terms of both funds and capacity. The size does, however, not necessarily relate to the acquisition propensity according to Amihud and Lev (1981), but their study only involved the relatively large companies on the Fortune 500-list. Wilson (1980) studied the acquisition propensity of multinational companies, and found a positive relation to the firms' product diversification, and negative relations were found to the length of foreign experience, early acquisition activities and the presence in less developed countries. Wilson could also see differences in the acquisition

propensity, but also in the relations to characteristics of the acquiring firms, due to the nationality of the headquarters, indicating cultural differences. How a company is controlled is another factor influencing the propensity to acquire. More precisely, conglomerate acquisitions are significantly more frequently made by management controlled companies than by owner-controlled companies (Amihud & Lev, 1981). This study will, however, not extend to include the size, nationality or organizational aspects, so acquisition propensity will not be problematized further.

4.3.2 Structural Extension: Spread in Structural Positions

Another way to approach the contextual extension of a business network change sequence was suggested through structural positions of the forces' context, which could be assessed through the actors involved in the studied events. A variety of structural measures describing actor attributes, not least centrality, can be found in social network analysis (cf. Everett & Borgatti, 2005; Freeman, 1979; Marsden, 2002; Wasserman & Faust, 1994), and such measures will be used exploratory to analyse the structural extension of the studied change sequence. Centrality measures give an idea of which actors that are involved in many ties or hold a position that is important because of its interlinking function or closeness to other actors (de Nooy, Mrvar & Batagelj, 2005; Wasserman & Faust, 1994). What is of interest is to regard the spread of the forces over the network structure, where a high extension implies an even distribution over different parts, or positions, ranging from peripheral to central.

Using such measures sets great demands on the data that is being analysed, as these measures relate each actor to the 'whole' network, requiring as much as possible of the whole network to be captured. As described in section 2.4, this study does not intend to capture a 'whole' network. Instead, the focus on the changes, in the form of events causing forces, result in that only a minor part of the business network is captured, and the structural measures thus risk losing their usability. The collected set of data is, however, in some ways a representation of the changing business network structure, through the inter-connectedness of the network elements formed around the events. The structural extension is thereby reflected through the coherence of the parts of the business network where the forces occur, and the structural extension can be analysed as the wideness of the structure of event-centred network elements.

4.3.3 Product Type Extension: Spread in Actor Categories

A third approach to the contextual extension of business network change was suggested to be the use of business network heterogeneity and to divide the business network into layers representing different categories of actors or business relationships. There are multitudes of thinkable aspects from which the analysis could be made, for instance different size measures or nationality, and each of them is likely to yield a slightly different picture. For feasibility reasons, only one aspect will be focused in this study, and that is the main product type of the actors. It can

be used as a characteristic of actors, to describe the composition of the network elements where change occurs and, in aggregated form, also to describe a business network change sequence. As was described earlier in this chapter, the studied IT-related business network contains IT-companies as well as other types of companies, and besides that division, which is rather obvious, is also the fact that IT-related products are rather heterogeneous.

4.3.3.1 Technology and Product Types in Related Research

Closely associated to product types is technology, which is a richly nuanced concept that is used to describe both production and products, and although they are interrelated, there is a substantial and important difference between them. The word technology refers to “a capability given by the practical application of knowledge” (Merriam-Webster) and can be described as applied science, knowledge on how to do something, means by which we solve problems, things we produce and tools and skills to use those things (Gow, 1995). Mintzberg (1983) reduces the knowledge dimension and is content with studying “the instruments used in the operating core to transform the inputs into outputs” (p.128), whereas Perrow (1972) focuses more on “the study of techniques or tasks” (p.141) rather than machines and devices. Technology is thus rather wide, and can be hard to discuss, but from this study’s business perspective, technology offers a dimension in which characteristics of companies can be described.

There is a vast amount of literature on technology and product types, and some have found technology to be an important variable for understanding the actions of organizations (Perrow, 1967; Thompson, 1967); making it something of a backbone to business. Perrow (1972) classifies organizations based on the kind of tasks that are performed within them; “the basic work-flow process” (p. 144), which besides production also includes, for example, sales, personnel, research and development and industrial relations. The degree of variability and the degree of uncertainty can be used to describe technology (Perrow, 1967), which reflects a variety in the difficulty of learning and executing tasks as one aspect of its complexity, by Woodward (1965) described as routine or non-routine. In the frequently cited work, Woodward distinguishes between three basic types of production technology: ‘Unit and Small Batch production’, ‘Large Batch and Mass Production’, and ‘Process Production’ (Woodward, 1965, fig.11 p.39). Woodward’s categorization offers a simple characterization and has quite a number of supporters. It distinguishes between standardized and customized production, but also differences in the complexity of the technique, the size of the product, the flexibility and the continuity of the production are included (Woodward, 1965). The three main categories actually contain a more specific eleven-point scale of production systems, reflecting the complexity of the technology, i.e. the controllability and predictability of the production process, and primarily concerns industrial production (Thompson, 1967; Woodward, 1965). It might seem narrowly focused on manufacturing companies, but also services may be produced as units

or masses, i.e. more or less standardized (cf. Gilmore, 2003), and also as a process, i.e. continuously supplied.

Technology can also be more directed towards product types, and an example of a way to categorize firms on the basis of the products is the dichotomy of integral (units) vs. dimensional (per weight, capacity, volume etc.) products (Woodward, 1965). Another way is to base the description on how the products of a company are used in the customer's production. With such an approach, categories could be raw & processed materials, components & parts, and equipment (Håkansson, 1982). This is however a categorization heavily influenced by the manufacturing industry, and perhaps not very suitable when studying IT-companies. Similarly, services can be classified, based on how the purchasing company uses them, as components, semi-manufactures, instruments or consumables (Wynstra, Axelsson & van der Valk, 2006).

This suggests a difference between goods and services, and the question of whether goods and services really differ has been posed, at least, since the 1960s (Johnston, 2005; Judd, 1964), led by a recognition of the bare existence of services (Brown, Fisk & Bitner, 1994). Describing goods as "products that are bought and sold in business" (Merriam-Webster) is not very satisfying when trying to distinguish between products in the form of goods and products in the form of services. However, there seems to be a kind of circle reasoning in the definitions of goods and services. Definitions of services are often vague and imprecise, and tend to be more of an excluding character, i.e. they are described by stating what it is not. Such examples are service as "all that is neither solid nor liquid" (Judd, 1964, p.58) and "the section of the economy that supplies needs of the consumer but produces no tangible goods" (Oxford English Dictionary). Going deeper into services, and describing more of its nature, one finds that "the object of the market transaction is other than the transfer of ownership [...] of a tangible commodity" (Judd, 1964, p.59). Anyhow, the existence of a difference between goods and services can be ascertained (Anderson, Fornell & Rust, 1997; Boone & Ganeshan, 2002; Gilmore, 2003). In summary, two unique features of services are the intangibility and the customer involvement in the delivery (Chase, 1996), to which also inseparability of production and consumption, heterogeneity and perishability, i.e. cannot be inventoried, can be added (Boone & Ganeshan, 2002; Zeithaml, Parasuraman & Berry, 1985). A large number of more detailed typologies than goods-services have been described (cf. Lovelock, 1983, Table 1), especially during the late 1970s and early 1980s which Chase (1996, p.300) refers to as the "classification era". Examples are classification through the two dimensions "degree of labour intensity" and "degree of interaction and customization", the dimensions "direct recipient of the service" and "nature of the service" (Lovelock, 1983) and the degree of contact, complexity and divergence (Shostack, 1987; Wemmerlöv, 1990). There are also thoughts on classifying services based on their relation to goods, e.g. Judd's (1964) rented goods services, owned goods services and non-goods services.

Technology, both regarding production and products, can be used to understand many different aspects of business: organizational structure (e.g. Mintzberg, 1983; Woodward, 1965), markets (Didrichsen, 1972; Hopkins, 1987; Thomas & Ford, 1995), marketing management (e.g. Brown, Fisk & Bitner, 1994; Wynstra, Axelsson & van der Valk, 2006; Zeithaml, Parasuraman & Berry, 1985) and operations management (e.g. Johnston, 2005), just to mention a few. Technology and product type are both important characteristics of companies, describing the type of operations and the line of business, and can be found in both acquisition and business network research. In acquisition research, technology is prevalent in, for example, motives, as it is possible that a company is bought in order to get control over its technology or products (e.g. Ahuja & Katila, 2001; Lehto & Lehtoranta, 2004; McBeath & Bacha, 2001; Prabhu, Chandy & Ellis, 2005; Ranft & Lord, 2002; Vanhaverbeke, Duysters & Noorderhaven, 2002). Another common use is to ascribe the acquirer and the target company characteristics based on the technology and product, which enables M&A typologies, for instance the widely used typology by the Federal Trade Commission (FTC), which analyzes the similarity of the consolidating companies.

Turning to the business network literature also shows some technological contents. Already in the early interaction model (Håkansson, 1982), technology is present both in the form of exchange of technical information and as an important character of the interacting parties. Technical issues are considered critical in buyer-seller interaction, and especially the technological adaptations heavily influence the interaction process. Throughout the work edited by Håkansson (1982), pioneering the business relationship and business network field, technology is a recurring aspect of great importance, which gives support for the relevance of discussing technology in business network studies. The relationship-focused business network studies naturally see technology within business relationships, thus primary making it a factor influencing the relationship (Forsgren, Holm & Johanson, 2005), and the output of the supplier and the production technology of the buyer are natural to combine (cf. Håkansson, 1982, Fig.3.1 p.35). Certain characteristics of the product and production technology seem to have a significant effect on the interaction between suppliers and customers. Different information flows, the frequency of exchange and the decision process varies together with the uncertainty and risk (Håkansson, 1982). There are also some examples of studies of business networks where technology has a quite central and multiplex role (e.g. Thomas & Ford, 1995), for example using a product or technology area to define and delimit a business network. Technology development is, in these studies, considered to best be understood as an integral part of the business network (Håkansson, 1989), and the relationship between technology and business networks is reciprocal (Anderson, 1994; Thomas & Ford, 1995). Such industry-like studies have, for example, been made around a paper pulp technique development (Waluszewski, 1990), digital image technology (Lundgren, 1995) and construction material (Bengtson, 2003).

4.3.3.2 *Categorizing Actors in Four Product Types*

A company's type of product can be described based on the technique and knowledge as well as on aspects that are more general. Unlike studies specifically focusing on technology and thereby needing detailed measures of it (cf. Lynch, 1974; Withey, Daft & Cooper, 1983), this study will settle with a categorization of companies based on their product types, i.e. more focused on the product than the production. It is a fairly rough categorization, which tries to reflect some aspects of the earlier discussion of technology and product types. The categories can be used to characterize single actors, but also to describe the composition of network elements and thereby the character of a business network change sequence. The business network, in which a change sequence is studied, is focused around IT-companies. Technology is already in that sense used for demarcation, similar to some of the other business network technology studies, but the more specific use of the product type dimension in this study is to address the heterogeneity of the studied business network; the product type categories are used to reflect a dimension that distinguishes different parts of a business network.

The four categories of product types that will be used in this study are: IT services, IT goods, IT various and non-IT. This is a relatively rough categorization and is less detailed than, for example, the Swedish Standard Industry Classification (SNI) in which group 72, 'Computer and related activities', contains seven sub-categories of IT-businesses. A less nuanced categorization is however considered enough for the purpose of this study and makes the data collection less extensive. As Woodward (1965) notes, there is a great heterogeneity in the technology of companies and every company is in some extent unique, so it can be hard to place a company in one of the groups. Computer software is one such example. It is highly intangible and the purchase of software does not primarily aim at transferring the ownership, since what is bought is rather the license to use the software than the software per se. But how about custom ordered software? Is it the sequence of computer code, or the service to get the code written that is bought?

Within the product type, "**IT services**" are IT-companies dealing with support, consultancy, education, software and systems. As exemplified, computer software and IT-based systems are perhaps not indisputably classified as services, but in this study they are categorized as services rather than goods, and companies dealing with software are thus considered to be service providers. This kind of IT services can be customized and thus imply a unit production, standardized and mass produced, or even continuously supplied in line with the process production. Customized services can, for example, be computer software written from scratch to suit the customer's requirements, an information system that requires large adaptations to the buyer's organization, or a course in using IT for the specific needs of the customer. An example of a mass produced service is the standardized software Microsoft Word, which is sold in large numbers without specific adaptations. Continuous service production is found in IT support, where support personnel is located on site, and so called ASP (Application Service Provider),

which is a form of software leasing, often meaning that the customer runs the software from the supplier's servers over some kind of network (Dickson & DeSanctis, 2001). ASP thus requires the supplier to continuously provide the service, in order for the customer to be able to use the software at any time. Yet another example of companies producing a continuous IT service are ISPs (Internet Service Providers), which provide constant internet access.

The category "**IT goods**" is also quite diverse, but is not as varying as the IT services group. Naturally, this category contains companies mainly producing or selling goods, which includes different kinds of computer hardware, both components and complete computers, but also monitors, printers and other devices. The production of these different goods is likely to vary between unit and small batch production to large batch and mass production, whereas process production is not believed to be of relevance to this type of products. To end the IT-related product types, the category labelled "**IT various**" contains companies which are vaguely specialised within the IT area, but also includes conglomerates. It thus comprises all types of products, i.e. both services and goods, as well as all types of production technologies. The category "IT various" is consequently quite vague, joined only by the focus on IT-related products.

This study's strong focus on IT related companies has shown in the first three categories and it furthermore shows in that all other companies, i.e. with products without an IT component, are categorized as "**non-IT**". The definition of this category is thus of the excluding type; it is based on the absence of IT in the main business of the company. If the "IT various" category was considered wide, "non-IT" is much wider as it includes, for example, industrial companies, investment companies, telecommunication companies and government organizations. Included in this group are services and goods, as well as all kinds of production technology. Naturally, this category can be divided into several, more precise, categories, describing the heterogeneity of all these different lines of business, but the IT focus of this study makes this rough handling of the large variety of non-IT companies legitimate. As shown in the two figures below, technology in the form of product types is used to represent a heterogeneity dimension of the changing business network. The IT-related business network consist of many different types of actors and, consequently, different content of the business relationships. Variations in business relationships will not be included in this study, but Figure 4.5 shows the heterogeneity through an illustration of the different categories of actors with different shapes.

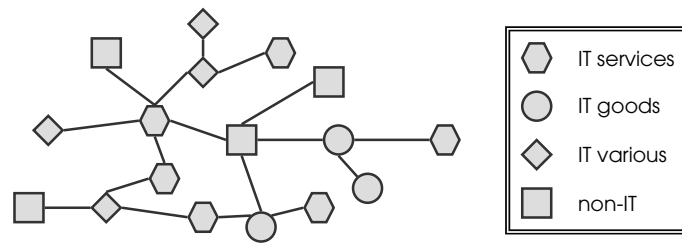


Figure 4.5 Product types as a heterogeneity dimension of a business network

Whereas that picture shows the business network as a structural representation, Figure 4.6 instead positions the same set of actors vertically depending on the product type. This shows the heterogeneity dimension more clearly, but is weaker in its representation of the network structure. By using a dimension that represents the heterogeneity, in this case product types, the extension can be assessed as the spread of forces in this dimension. The type of actors that are involved in the mergers, acquisitions and bankruptcies, i.e. on which the forces act, shows which parts of the business network that are affected by the forces.

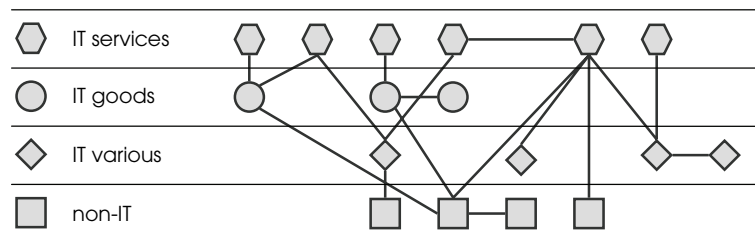


Figure 4.6 Product type heterogeneity shown as layers of actors

It is naturally of interest to consider wider settings also in this indicator of extension of business network change, and the composition of the event-centred network elements could thus be described based on the product categories presented here. When assessing product type extension of the studied business network change sequence, a high value would mean that the event-centred network elements involve actors of different products and technologies, as this shows that the forces act in different parts of the business network. Through such an analysis, a richer understanding of the point of impact of the forces is obtained, and this kind of composition analysis can be further nuanced by combining the product types with the roles in the events. In this study, not only the acquiring and the target company are included in the product type analysis, but also the other roles in the acquisition situations. A comparative analysis of that kind can either be made as a bi-dimensional analysis, i.e. posing the product type of two of the roles

against each other, or through multi-dimensional analysis, for example using the product type of the acquiring company, the target company and other actors as well. Such analyses could yield categories describing the distribution of product types over the various roles, and such a categorization could, formed by the analysis and based on the data, distinguish interesting categories of events.

The described use of product type categories, to describe the occurrence of forces within different sub-sectors of the business network, suggests one way to address the heterogeneity of business network. It gives a possibility to analyse where in the business network the forces act, and thus where the changes occur, as intended by the contextual extension dimension.

4.4 Concluding Analytical Model

Whereas Chapter 2 introduced the suggested force-based approach to business network change on a generic level, the third and fourth chapters have specified the approach to the focused situation containing many mergers, acquisitions and bankruptcies. This chapter has thus defined the Swedish IT-related business network, which is the empirical focus of the study, and described how business network change, as suggested from the force-based approach, will be approached in this study. This section will conclude this reasoning in an analytical model, shown in Figure 4.7, which will be used to structure the analysis in the empirical study.

The model can be divided into two halves, where the left part concerns the logics behind the suggested approach to business network change and the right part is about the dimensions used to describe the characters of a business network change sequence. Starting with the foundation of the suggested force-based approach to business network change, the bottom of the left part of the figure contains **events**, which are relatively concrete happenings of different kinds: in this study mergers, acquisitions and bankruptcies. These events were, in Chapter 3, declared to have a potential impact on the business network in which they occur, and the events are thus considered to give rise to **forces**. What kind of forces that various events give rise to is a research issue in its own, which is not covered by the current study, and the empirical study will therefore need to focus the events, based on the assumption that they give rise to forces. The events and forces will thus in some aspects be treated in combination, which is illustrated by the dashed line surrounding the events and forces. This interchangeable use means a reduced precision of this study, but is necessary for the feasibility of it.

A fundamental aspect of the forces is that they appear in a context, which is what the events act on as forces. The business network perspective of this thesis naturally means that the context is seen in terms of related actors and connected relations. The immediate contexts of the forces are analyzed through **event-centred network elements**. A network element is a sub-network, i.e. an excerpt of the changing business network, and consists of actors directly involved in a

particular event and actors related to any of the directly involved actors. The network elements used in this study are centred on an event and extend one relation out from the event. The stabilizing mechanisms that were included in the earlier description of the force-based approach to acknowledge that not all forces do have an impact on the business network, are omitted from this analytical model, but are an important aspect for the general reasoning on the effects of events. Through their wider view of mergers, acquisitions and bankruptcies, the event-centred network elements identify some actors that most likely are affected by the event, and are a way to enable analysis of the immediate contexts of forces. What is important from a business network perspective is, however, the linkages between them through time and structure. The event-centred network elements can overlap through linkages in the form of direct involvements as well as relations, and together enable the description of a **business network change sequence**. What is studied is thus a structure and sequence of inter-linked event-centred network elements in the Swedish IT-related business network, and this is the type of business network change that is captured by the suggested force-based approach.

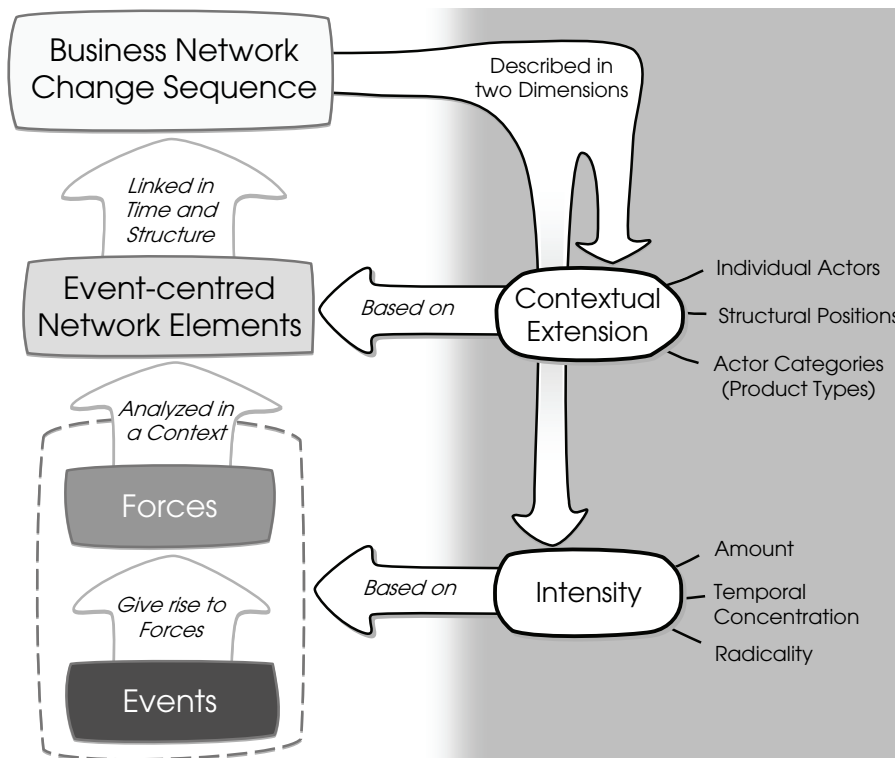


Figure 4.7 Analytical model of business network change
 Containing the underlying logics as well as describing dimensions of a business network change sequence.

When a business network change sequence has been formed by occurring forces, studied through events and event-centred network elements, the right part of the analytical model takes over and indicates the two dimensions that are used to describe a business network change sequence. These dimensions, and their indicators, have in this chapter been specified in relation to the studied situation, and thus prepared for an application on mergers, acquisitions and bankruptcies, although the study's explorative approach is reflected in the absence of specific measures of the indicators. Three indicators for each of the two dimensions were however specified, and these will form the structure of the analysis. Starting from the bottom, one of the dimensions is the **intensity**, of which the assessment is based on the events and forces. Three indicators have been suggested to together make up the intensity of the business network change sequence: First, the *amount* is rather self-explanatory, and is based on the bare number of mergers, acquisitions and bankruptcies. Second, the *temporal concentration* looks at the distribution of the forces over time, and is based on the evenness of the number of events per period of time. Third, the *radicality* describes the aggregated character of the forces, and is analyzed based on assumptions of the proportion of radical forces from different types of events. Together they form a 3-dimensional construction, shown in the leftmost part of Figure 4.8 as amount (y-axis), temporal concentration (z-axis) and radicality (x-axis), and they all address different aspects of the occurrence of events and forces that together indicate the intensity of a business network change sequence.

The other descriptive dimension is the **contextual extension** of the business network change sequence, which describes the place of impact of the forces and is assessed based on the event-centred network elements. Also this dimension is based on three indicators, and first is the spread of the forces over *individual actors*, which is evaluated based on the spread of involvements in the studied events over different actors. Second is the spread in *structural positions*, which analyses the position of the actors involved in events, and can thereby describe the wideness of the spread of the forces over the changing business network. Third is the spread in *actor categories*, which in this study is defined by the *product types* of the actors, and a high mixed representation of the categories in the involvement in events is seen as a high extension. This dimension is also a 3-dimensional construction with extensions in individual actors (y-axis), structural positions (z-axis) and actor categories/product types (x-axis) as the indicators, as shown in the middle of the figure. Finally, in the right part of Figure 4.8, the combined character of a business network change sequence is a 2-dimensional addition of the intensity and contextual extension, where both dimensions are required to have a high value to get the maximum result.

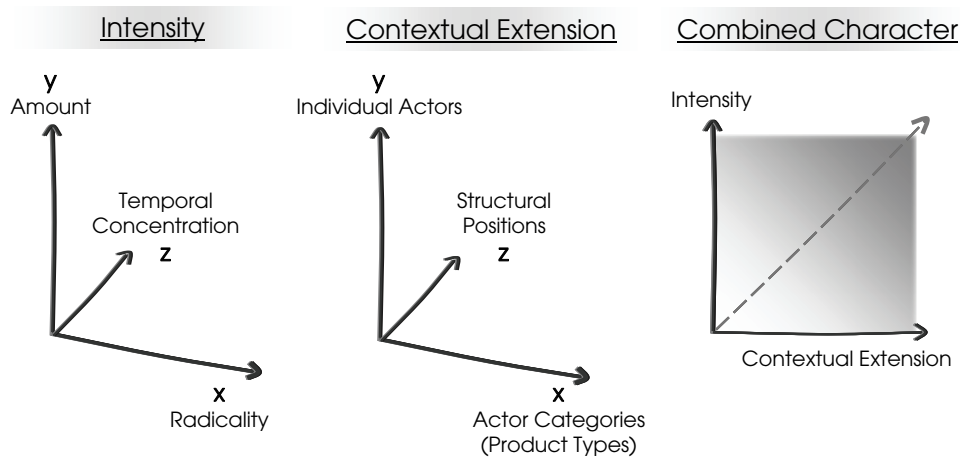


Figure 4.8 The dimensions and indicators describing business network change

These describing dimensions and their indicators are relative rather than absolute variables, which will have to be considered in the analysis. Furthermore, the proposed meanings of the indicators are by no means flawless and definite; instead, developing the indicators is an important part of the upcoming, tentative, analysis. For example, the heterogeneity of business networks is naturally not fully captured with the use of the proposed product type categories. Many more actor characteristics, but also relational characteristics, should be included to get a more multiplex representation of the heterogeneity of business networks. The business relationships are largely excluded from this study, except as a requirement for including actors in the network elements, i.e. a business relationship vouches for the association of an actor to an event, where the business relationships are handled together with various other types of relations, such as ownerships and partnerships. Future studies of the heterogeneity of business networks could well include relational characteristics such as the strength, extent of exchange and level of adaptation. Likewise, the difference in connections between business networks could perhaps be fruitful in capturing the heterogeneity of business networks. In concern of the scope of this thesis, those aspects are however left for further research to include. With such delimitations made, the analytical model shown in Figure 4.7 should enable a tentative study of the mergers, acquisitions and bankruptcies involving Swedish IT-companies.

5 mabIT - A Data Structuration Technique

Whereas the previous chapter took a step closer to the empirical study by specifying the force-based approach based on the focus on mergers, acquisitions and bankruptcies and concluding in an analytical model, this chapter continues to prepare for the empirical study by describing the actual data collection and design. As was presented in the introduction chapter, a data structuration technique was developed in the preceding licentiate thesis (Dahlin, 2005), designed to enable studies of the many mergers, acquisitions and bankruptcies involving Swedish IT-companies as business network change. This thesis makes use of, and furthers, that technique.

5.1 Conditions for the Study

When closing in on the actual empirical study, the research questions posed in the first chapter must be considered, together with the developed model for analysis, in this case based on the suggested force-based approach to business network change. This chapter will start with a summary of some of the conditions and prerequisites inherited from the research questions along with the suggested approach; followed by an elaboration on the longitudinal and retrospective character of this study.

5.1.1 Inherited Requirements

Studying business network change naturally requires a way to apprehend business networks, which are abstract theoretical constructs and thereby hard to capture empirically. The data collection must therefore be focused on something more tangible, in this case actors, business relationships and other relations, which then can be used to compile a business network structure. But relations are also abstract descriptions of interactions between two actors, primarily companies, so capturing relations and business relationships can also be problematic, not least since some consider business relationships to be difficult, or even impossible, to understand for all but those involved in the relationship (Forsgren, Holm & Johanson, 2005). Gaining an understanding about a business network will therefore be a question of looking for indications of interactions that can be seen as relations and arranging these to form a structure that can be considered a business network.

The force-based approach to business network change is explicitly directed towards capturing business networks as a wider structure, thereby sacrificing the understanding for details. This is not abandoned through the focus of the data collection on capturing actors and business relationships, but will permeate the design of the method. In studies emphasising the actors, business relationships and

connections within the business network, the point of departure also lies in the parts of the network as some specific actor or business relationship can be of interest, for example because of interesting technology (e.g. Anderson, Håkansson & Johanson, 1994), changes of the actor (e.g. Bångens & Araujo, 2002) or perhaps specific characteristics of the business relationship. Studying the business network surrounding this focal point is, thereby, a matter of identifying business relationships that are connected to the focal business relationship or to the business relationships of the focal actor. By taking an actor or business relationship as the central point of the business network and, thereby, studying the network as the business relationships surrounding this central point, the business network becomes a context (cf. Blankenburg Holm, 1996a; Grabher, 1993; Håkansson & Snehota, 1989; Snehota, 1990). Such a centre is created naturally, but in this study, which attempts to capture a wider business network, the centre around which the data collection will revolve is instead defined by the forces and therein involved actors.

So, as given by the force-based approach, business network change will be described through the forces within it. The occurrence, characteristics and immediate contexts of the forces will together describe the intensity and extension of the change of the studied business network change sequence, and these set relatively clear requirements of capturing a large number of forces. Much is thus built on the forces, and the recent turbulence among Swedish IT-companies offers an excellent opportunity to find a situation containing many events giving rise to, potentially radical, forces. Of the different events during the turbulence, this study will focus on bankruptcies, mergers and acquisitions. Start-ups are surely interesting, but due to the nature of business relationships, a start-up mostly involves gradual changes as the development of business relationships is an incremental process (Håkansson & Snehota, 1995). Start-ups are thus likely to yield more adjustive forces, due to the incremental development of business relationships, whereas bankruptcies, mergers and acquisitions, on the other hand, are likely to yield more radical forces. Studying the revolving situation among Swedish IT-companies can be seen as an extreme case, and extreme cases can be used to make some aspects of the studied phenomenon appear more clearly. It is thus an effective way to reveal certain aspects and characteristics of the studied phenomenon, but requires attention to the generalizability of the observation. With the intention of making the change appear clearer, the focus on mergers, acquisitions and bankruptcies is considered justified. Therefore, besides actors and business relationships, the data collection will aim at finding mergers, acquisitions and bankruptcies. As the description of the Swedish IT-sector indicated (see section 1.1), the public records are insufficient due both to the lack of coverage of mergers and acquisitions, and the need for information about specific events and companies, which the aggregated data does not offer. As the presentation of the data structuration technique in the introductory chapter revealed, news items are used as a data source in order to meet the requirements for wide coverage of the three types of events, but also the opportunity to find indications of various

relations. The data source issue will, however, be further discussed later, in section 5.3.

5.1.2 A Longitudinal and Retrospective Ambition

Gadde and Mattsson's (1987) study shows that although individual business relationships are relatively stable, a business network clearly changes when studied over an number of years. Normally, the passing of time is inevitable, but time can be made a more or less explicit factor. The suggested force-based approach incorporates the time aspect through the business network change sequence; the occurrence of forces is what forms the sequence, and these occurrences are closely related to the passing of time since the forces occur at different points of time. Besides the structural coherence from the business network, the time also connects the individual forces, and makes them an inter-linked phenomenon. Furthermore, the studied situation extends over several years, which makes a longitudinal study quite natural.

Longitudinal research can be defined as "those techniques, methodologies and activities which permit the observation, description and/or classification of organizational phenomena in such a way that process can be identified and empirically documented" (Kimberly, 1976, p.329), where process can be understood as "any sequence of changes" (Miller & Friesen, 1982, p.1014). Longitudinal studies facilitate attempts to establish causality, enable better understanding of organizational growth and change and permit the acknowledgement of contextual constraints (Kimberly, 1976). Generally, longitudinal analysis enables "a sounder understanding of organizations" (Miller & Friesen, 1982, p. 1014), especially concerning explanations of developments, and this potential for giving deeper insights in the processes and causalities should also be promising for business network studies (Welch, 2000). The lack of, and call for more, longitudinal studies has been noted in organizational research (e.g. Miller & Friesen, 1982), social network research (e.g. Emirbayer & Goodwin, 1994) and various other topics (e.g. White & Arzi, 2005). Some have also pointed out a need for more longitudinal studies of business networks (e.g. Dubois, Gadde & Mattsson, 2003; Halinen & Törnroos, 1995; Knoblen, Oerlemans & Rutten, 2006). Welch (2000, p.200-201) notes that "while tracing the dynamics of a network over time is regarded as central to the IMP approach, longitudinal research is still relatively uncommon", but also mentions some exceptions (e.g. Gadde & Mattsson, 1987; Kinch, 1987). Even though time is central to interaction, and thereby also for understanding business relationships and business networks, a model that is good at handling it is still missing (Ford & Håkansson, 2006).

The main strength of a longitudinal approach is, naturally, that it adds a temporal dimension (Welch, 2000). Including time can be necessary for the understanding of business network change (Forsgren, Holm & Johanson, 2005; Knoblen, Oerlemans & Rutten, 2006), and it might be natural, although not necessary, to include a time dimension in studies of change, regardless of whether change is seen as a process

or as differences between states (Pettigrew, 1990). These two approaches to change are however quite different, not least in the design of the study. Process studies, in which the sequences of events are in focus, are good at obtaining in-depth descriptions of the change (Langley, 1999). They are easily made retrospectively, and set their focus on the occasions where something interesting happens. Studying change can also be made by looking at different states, and comparing situations or measurements between the states (e.g. Forsgren, Holm & Johanson, 2005; Gadde & Mattsson, 1987; Havila & Salmi, 2000). Such a study might well report on fixed points in time, potentially reporting on an absence of change. The possible variations of longitudinal studies are many (White & Arzi, 2005), and an interesting classification based on the breadth of focus, sample size and the extent to which quantification occurs is found in Miller and Friesen (1982).

Longitudinal field research is not only advantageous, but is also associated with many problematic issues, for example concerning how to deal with time, data selection and collection and the complex analysis (Pettigrew, 1990). The data collection is naturally of utmost importance to the result of an empirical study, and some definitions of longitudinal research tend to include characteristics of data and data collection, for example, as “any study in which two or more measures or observations are made at different times of the same individuals or entities” or “one in which two or more measures or observations of a comparable form are made of the same individuals or entities over a period of at least one year” (White & Arzi, 2005, p.138). With an ambition of capturing a longitudinal course of events, data collection and handling must be adapted, and one way to capture a longitudinal phenomenon is to follow and record the process as it happens, which is a very time consuming approach due to its real-time progress. Identifying and finding ongoing processes already from their start can be hard, but obtaining longitudinal data does not necessarily require a longitudinal data collection. Retrospective studies, for example using archival records, are a rewarding option if several years are to be covered and past phenomena can be identified (Scott, 1990; Welch, 2000). Furthermore, to get a nuanced picture, there is also a great potential in combining retrospective and real-time data collection and analysis (Pettigrew, 1990). Concerning business network studies of longitudinal character, examples of qualitative nature are most common (e.g. Forsgren & Olsson, 1992; Hallén & Johanson, 2004; Havila & Salmi, 2000). Within network theory and social network analysis, a quantitative approach is more frequent, involving statistical and simulation models (e.g. Huisman & Snijders, 2003; Snijders, 2005) or comparison of states of a networks at different points in time (e.g. Faust & Skvoretz, 2002; Wasserman & Iacobucci, 1988).

Studies of a business over a period of time can easily come to involve many firms and many variables, making the analysis very complex (Miller & Friesen, 1982). In quantitative longitudinal studies, both linear and multivariate nonlinear statistical techniques are used to analyse longitudinal data (Miller & Friesen, 1982), and the vast field of time series analysis is an example of the wide possibilities (Brockwell &

Davis, 2002; Wei, 2006). Consequently, there are quite a number of articles addressing different aspects of statistical analysis of longitudinal data (e.g. Muller et al., 2005; Neugebauer & van der Laan, 2006) and the handling of missing data, i.e. imputation, (e.g. Twisk & de Vente, 2002; Wang & Fitzmaurice, 2006; Youk, Stone & Marsh, 2004). Qualitative studies covering a phenomenon over time are perhaps not as explicit in their use of the time dimension. Case studies often describe a process or sequence of events, i.e. the development of something, without necessarily specifying the points in time explicitly.

A longitudinal dimension is embedded in the force-based approach, which adds an understanding of business network dynamics over time, and the time aspect is thereby important to consider in empirical studies using this approach. In this study, the arranging of the data in a time dimension is based on the dates of the events, which represent forces that form a change sequence. Dating mergers, acquisitions and bankruptcies is, however, not easy (Rydén, 1971), an issue that will be expanded on further later on. The rather explicit use of the time aspect sets some requirements on the data collection and handling. The data source used must provide a somewhat explicit time specification, and looking back at the turbulent situation among Swedish IT-companies requires a data source that allows retrospective data collection. The call for more longitudinal studies can be interpreted as a call for studies covering a longer period, as also a relatively short process description can be considered a longitudinal study. This study's focus on the turbulent situation implies an inclusion of a rather extended period, covering the turbulence, so a pragmatic yet systematic handling of the temporal dimension is required since mergers, acquisitions and bankruptcies can be difficult to date.

5.2 Introducing the Data Structuration Technique

A number of conditions for the study have been set, and following these, business networks as well as mergers, acquisitions and bankruptcies are thus not entirely unproblematic to study. As the introduction clearly stated, this study will use and continue the development of a data structuration technique which, in part, was presented already in the licentiate thesis preceding this work (Dahlin, 2005). It will thus not be possible to consider the conditions and requirements discussed in the last section, following the force-based approach, all from the start of the design of the method. However, the requirements stated in the licentiate thesis, setting the direction of the development of the data structuration technique, are generally similar to the ones stated here. What has been added since then is the required alignment with the force-based approach to business network change. That primarily affects the analysis, which the preceding work did not focus on. The data structuration technique inherited from Dahlin (2005) is thereby well suited for the current study's conditions.

5.2.1 Methodological Ambition

Before describing the technique further, alternative approaches and data collection techniques are worth considering. To start with, the ambitions of different approaches vary greatly even within the business network domain, related to, but not to be confused with data collection methods, such as interviews or questionnaires, and data analysis methods, which both will be discussed in a later section. Case studies of business networks, of which there are many examples (e.g. Baraldi, 2003; Bengtson, 2003; Waluszewski, 1990), are generally intended to give a great understanding of specific cases, which enable many factors to be included, but on the other hand sacrifice the search for causalities and general patterns. Wider studies of a phenomenon, often quantitative in data handling and analysis (e.g. Forsgren, Holm & Thilenius, 1997; Uzzi, 1996), are quite the opposite, as the understanding for specific cases is exchanged for an understanding of patterns over a larger number of observations. Combinations of these two are naturally also possible (e.g. Coviello, 2005; Forsgren, Holm & Johanson, 2005). This addresses the difference between idiographic methods, valuing knowledge about concrete and unique properties, and nomothetic methods, valuing the general properties of reality (Windelband & Oakes, 1980).

However, not only should the method correspond to the epistemological values, it is also a matter of obtaining an appropriate level of detail in the observations. Approaches attempting to understand something specific naturally require rich data on the selected case, which is why qualitative data and analysis is often used. General pattern-seeking approaches are, on the other hand, more inclined towards using quantitative data and analysis in order to enable a wider coverage. As mentioned, business network studies have made use of both qualitative and quantitative data and analysis, and there are idiographic as well as nomothetic ambitions. This study will apply the force-based approach to business network change on the mergers, acquisitions and bankruptcies among Swedish IT-companies and is thereby a case study, describing a change sequence in the Swedish IT-related business network. Nevertheless, within the studied situation is an ambition to capture business network change as a wider phenomenon, and the force-based approach thus requires a relatively large amount of forces and events to be included in the study.

Network analysis is rather interesting as it owes much to its inspiring disciplines also concerning its methodology; for instance, sociology, psychology, anthropology and mathematics (Wasserman & Faust, 1994). One such inheritance is that the methodological groundings can be quite technical, for example, in the form of sociometry, graph theory and statistics (Parkhe, Wasserman & Ralston, 2006) and another is a strong focus on patterns or regularities (Wasserman & Faust, 1994). Characteristics of the actors and relations can be measured and included in the analysis, but the basic data that is required is which the actors are and how they are related to each other. This might sound simple, and although it probably can be

made a lot more complicated, the interesting part is the advanced handling of such relatively simple data.

In line with the set conditions, information is required on a wide coverage of actors, relations and events in the situation studied. Additionally, data covering several years, in retrospect, must be used to get a longitudinal data set. To enable this, the study will rely on a combined use of qualitative and quantitative data on a rather large number of observations together representing a case. For practical reasons, this means that the level of detail will be lower than a 'traditional' case study, but in some aspects greater than a traditional quantitative study. The news items provide qualitative data that to some extent will be quantified, and the analysis will be a mix of quantitative and qualitative methods.

5.2.2 The Idea Behind mabIT

The basic idea behind the design of this study is to use qualitative archival data to meet the proposed requirements and to build up a data set that enables studies of a business network change sequence. Using this kind of source enables access to information about a large variety of companies, relations, mergers, acquisitions and bankruptcies, and it allows the study to extend back in time and still get information compiled at the time of the event. To make the archival data represent business networks and business network change however requires a large amount of systematic organization of the data, including reduction and coding. This is the core of the data structuration technique used; adding structure to the data through a number of tools and steps of analysis. The implementation of the data structuration technique used in this study is called "mabIT", which is an acronym for mergers, acquisitions and bankruptcies involving Swedish IT-companies. The technique, and its application in this study, will be described in the remains of this chapter, and as it is not a 'standard' research method, a rather thorough explanation of it will be given to make the study apprehensible. To guide this explanation, a model of the used data structuration technique is shown in Figure 5.1, described as an iterative process supported by a number of tools. The stages in the process are shown as blocks in the middle of the picture, the iterative nature of the process is shown as the cycling arrows above the stage model, and the tools used at the different stages are shown below the model.

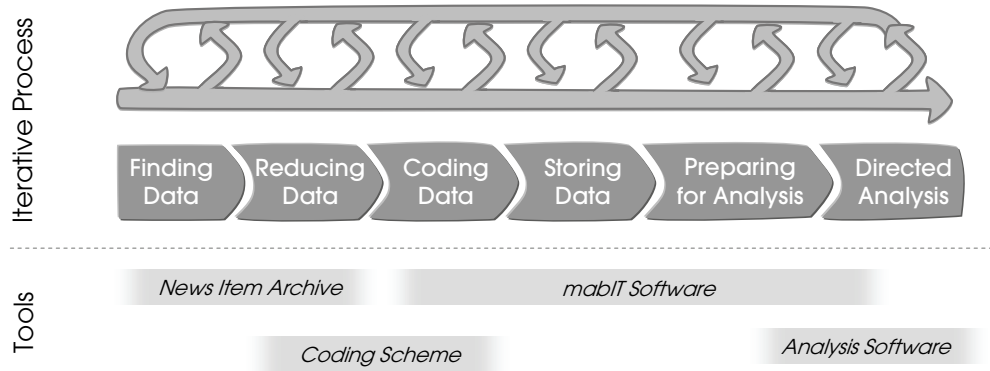


Figure 5.1 The data structuration technique as an iterative process
 Showing six steps supported by a number of tools

Starting with the stages, the data structuration technique consists of six main steps: **finding data**, **reducing data**, **coding data**, **storing data**, **preparing for analysis** and finally the **directed analysis**. The division into stages, and the illustration through blocks in Figure 5.1, is not meant to address the importance or time consumption of the different stages, they are merely identified as different, although intertwined, stages. Together they process data and make it usable according to the current area of application. These stages show some resemblance to the parts of data warehouse solutions: transformation, cleaning, loading, scheduling and metadata (Watson, 2003), and the entire data structuration technique does in some aspects resemble data warehouse and business intelligence solutions (cf. Cunningham, Song & Chen, 2006; Liautaud & Hammond, 2000; Watson, 2003).

Finding data means finding a suitable data source that holds information about the studied situation, gives extensive inclusion and covers the studied period. To deal with these requirements, a vast amount of available news items is used. In this stage, a news item archive, holding these news items, is used, which makes access easy. The large amount of available news items together with the easy access is naturally advantageous in some ways, but it also requires a stage of **reducing data**. Strict filtering and assessment reduces the large amount of input data to increase the usability ratio. The data reduction is facilitated by the use of two different tools. The *news item archive* offers the opportunity to reduce the total number of news items by specifying certain newspapers, periods and search terms. The other tool is a *coding scheme*, which specifies which aspects and variables are relevant to the study. The coding scheme helps specify the search terms and makes up the basis of the relevance assessment in the manual read-through of the news items residing after the database filtering.

The main purpose of the coding scheme is, however, to assist in the stage of **coding data**, which involves creating meta-data out of relevant aspects. The meta-

data, i.e. coded data, describes the original data through a number of variables and makes the data both manageable and usable. Whereas the coding scheme regulates what is coded, another tool handles the coding practically through a user interface and a number of coding guides: the *mabIT software*, which is a self-developed software written for this purpose. This software tool also handles the fourth stage, **storing data**, which may sound rather commonplace, but it is an important step in organizing the interrelated variables. The mabIT software is furthermore used in the **preparing for analysis** phase, which makes up the fifth stage of the data structuration process. This step starts ascribing certain meaning to the meta-data, and the variables are related to each other, in order to enable some particular analysis. It also comprises operations where the coded data is arranged in analysable and exportable forms.

The sixth and last stage is the **directed analysis**. The data structuration process involves a lot of analysis throughout all stages since finding, reducing and coding data are all highly dependent on analysis to yield results. The ‘directedness’ of the directed analysis stage however refers to the use of the coded data in question driven analyses, i.e. where the structured data is used to create descriptions or answer questions. The mabIT software can be used for some analysis, but there is also a possibility to compile and extract data for use in various external *analysis applications*, such as SPSS for statistical analysis and Pajek for social network analysis. The result of the data structuration technique is a relatively large amount of interrelated coded meta-data describing actors, relations, mergers, acquisitions and bankruptcies and this set of data is created in order to enable studies of change of business networks.

The iterations, shown as circular arrows above the stages, are included to indicate that the shown stages do not form a linear and single process, but rather a repeated process of learning, developing and refining. The tools were gradually developed, and the input data was processed in several batches. The use of the data structuration technique, as well as the mabIT software, has thus coincided with the development of it. Each stage was planned in the initial design phase, but the tentative use made a constant redesign necessary. When the licentiate thesis was presented, some of the input data had been processed through the reduction, coding and storing stages, but except from a descriptive presentation of the coded data, the two analysis stages were largely untouched. To continue the work from the licentiate thesis, more data was collected and processed, and eventually the data structuration technique was applied to the specific research problem of this thesis by fitting it into the force-based approach to business network change, as specified in the analytical model.

5.3 Finding Data

The first stage of the data structuration technique is about finding data. To reach the aim and ambition of the study, the data source must naturally give information

about the included aspects, i.e. actors, relations and events. Furthermore, a wide coverage is required, still including some details of the individual observations, and retrospective coverage is also stipulated. The idea behind the technique is to enable the use of existing information in various sources and adapt that information to the specific study by coding the information in certain aspects. In this study, news items, i.e. articles from news and trade papers, are the primary data source due to their availability and contemporary nature, described later in this section.

5.3.1 Using News Items as Data Source

Before discussing the advantages and disadvantages of the data source used, it will be described in more general terms. As already mentioned, news items are the main data source, whereas, for example, annual reports, company databases and webpages are used as complementary sources in a later stage of the process. Newspapers, trade papers and the business press all contain various articles that describe mergers, acquisitions and bankruptcies. News items can be anything from a short notice to an extensive story about the involved companies, so the purpose of them can vary and so can the amount of usable information. The work reported in the licentiate thesis did, however show potential in getting information about the studied types of events and, just as important, about actors and relations, in news items.

Highlighting the pros and cons of the selected data source can be done by relating it to other types of sources, for example individuals or compiled records. Similar to the graphs in the introduction chapter, which showed the development of the Swedish IT-sector according to government records, research on mergers, acquisitions and bankruptcies has sometimes used various forms of compiled statistics as the main data source (e.g. Chatterjee & Lubatkin, 1990; Kusewitt, 1985; Pfeffer, 1972). Such sources are good at describing these events as macro-level phenomena, but are likely to miss the details. These events are naturally also possible to study based on information gained from people in the involved companies (e.g. Capron, Dussauge & Mitchell, 1998; Walsh, 1989), which can give a deeper understanding of a few cases. Concerning business networks, which are rather hard to study, the research has a strong tradition in case studies (Easton & Håkansson, 1996), although wider surveys have also been used (e.g. Forsgren, Holm & Johanson, 2005, Appendix D). Somehow, information about business related interaction between companies must be found, and then that information can be compiled to represent business networks in line with the definition used. The source of this information has predominantly been individuals within the companies and interviews have been found to be the dominating data source in business network studies (Dahlin, Fors & Öberg, 2006; Welch, 2000).

Interviews and surveys both use individuals within the companies as their data source, although they often aim at getting different kinds of data, suited for different kinds of analysis. The study by Rydén (1971), partly to address the lack of M&A data in Sweden, considered using surveys, but did not do so because of the

high resource demands in relation to the expected low degree of response. Furthermore, and this is important, with individuals as the data source, the possibility to get descriptions of events from a number of years ago is reduced, and a protective and rationalized story is likely to be told. Instead, Rydén decided to use newspapers and annual reports, which some other extensive studies had done before him (e.g. Bushnell, 1961; Nelson, 1959). As was concluded already in the introductory chapter, government records give a wide but simplistic picture, whereas, for instance, interviews can give rich information but are limited to a few observations. Another possible data source, besides individuals and compiled records, is thus different types of available information, such as news items and annual reports, but also various archives. Company archives, for example holding contracts and other documents describing interaction between companies, can be useful for studies of business relationships and business networks (Easton, 1995), but have been poorly used. Besides access issues, business relationships involve so much more than contracts regulating the exchange of products for money, and the necessity to regulate the interaction within a business relationship with formal contracts is not evident.

Studying business network change and mergers, acquisitions and bankruptcies could certainly be done through any of these mentioned data sources, but news items are considered a good compromise for the ambition of this study, giving some details but still enabling a wide coverage. Newspaper articles have been used in studies with similar interests, for example, by Bushnell (1961) and Nelson (1959), but also in Sweden by Rydén (1971), who spent eight years going through newspapers to identify mergers and acquisitions. The details of Rydén's data handling are, however, not thoroughly accounted for, but the analysis is mainly shown as aggregated trends and distributions. No relations between companies are included in Rydén's study, but others (e.g. Cecil, Green & McNaughton, 1996; Vonortas & Safioleas, 1997) have made use of a commercial data set called Information Technology Strategic Alliances (ITSA), holding information about strategic alliances among IT-companies extracted from alliance announcements in newspapers and trade magazines (Rohrbough, 1991; Vonortas & Safioleas, 1997). These studies, together with the experience from the preceding licentiate thesis, suggests that getting information about actors and relations as well as mergers, acquisitions and bankruptcies should thus be possible from this kind of source.

The use of news items can in some aspects be compared to the use of archival data of different kinds, which have been the data source in studies in a variety of fields, but its main application in business research has probably been in economic history and similar topics (Welch, 2000). There are different kinds of archival sources, and whereas this study make use of news items, which are publicly available, the term "archival" could also refer to companies' own archives of business documents (e.g. Mintzberg & McHugh, 1985). As mentioned, business network research has relied heavily on in-depth interviews to gather data. A methodological diversity is missing, and Welch (2000) promotes the use of archival data by mentioning three main uses:

to add empirical depth, generate developmental explanations, and challenge existing theories. Although the different data sources may be of varying suitability for different purposes, they could also be seen as complements, for example by offering complementary information to interviews. All types of sources have their strengths and weaknesses, and through a combined use, reliability through triangulation could be achieved. Selecting a data source, and data collection method, is an act of balance between extension and resources, width and depth. Welch (2000, Table 1) makes a comparison between archival and interview data collection methods from a number of aspects. That comparison is reproduced in Table 5.1 below, where news items have been separated from Welch's "archival" column, and a row describing the accessibility of the data sources has been added.

Factor	Archival	Interview	<i>News items</i>
Temporal focus	Longitudinal	Contemporary	<i>Longitudinal</i>
Detail	High	Low	<i>Low</i>
Communication	Unobtrusive	Interactive	<i>Unobtrusive</i>
Contingency	No	Yes	<i>No</i>
Iteration	High	Low	<i>High</i>
Theoretical generalizability	Yes	Yes	<i>Yes</i>
<i>Accessibility</i>	<i>Restricted</i>	<i>Restricted</i>	<i>Extensive</i>

Table 5.1 Comparison between data collection methods and sources
Based on Table 1 in Welch (2000), all italic items added.

The accessibility and contingency are considered especially interesting and will be further described in the following sections, where the input used in the data structuration technique will be discussed both regarding quality and quantity, as every data source has its own advantages and disadvantages. Quality and quantity are not necessarily opposites, but a trade-off is most likely required with respect to the available resources.

5.3.2 Availability and Accessibility

There are relatively good records of mergers and acquisitions in UK and USA, but Sweden has unfortunately not been keeping good records of such events (Rydén, 1971), except for the legal act in mergers and when competition regulation steps in (Holtström, 2003). The available information about bankruptcies should certainly not be disregarded, but it naturally limits the scope of the study to only cover bankruptcies. Some commercial databases hold information about mergers and acquisitions, available to anyone willing to pay for it. Examples of such services are

Förvärv & Fusioner⁴, registering mergers and acquisitions since 1993, Adeqvat⁵, who identifies mergers and acquisitions by looking for companies where the entire board of directors have been changed during the last 12 months (Hellblom, 2007), and the international alternative Mergermarket⁶, looking for M&A news in about 2000 sources around the world.

When using precompiled records, the information is naturally limited to the compiler's inclusion, both in terms of included aspects and included types of companies; there is no opportunity to ask further questions. This is a definite weakness of this kind of data, as it might be collected and compiled with another interest than the study's. However, using compiled records, in the extent available, makes the longitudinal and retrospective aspect quite explicit. In this study, the arranging of the data in a time dimension is largely based on the dating of the mergers, acquisitions and bankruptcies, so using information of when the event took place reveals the time dimension. The idea behind compiling records of the number of events is to a large extent to enable analysis over time, and the data thereby has the time dimension embedded.

Conducting data collection by somehow getting information from persons in the companies of interest makes the availability and accessibility dependent on the researcher's ability to find the suitable respondents and the respondents' willingness to cooperate. The number of possible respondents can, on the other hand, be quite large, and the number of sources used is probably dependent on the scope of the data collection and the available resources. Individuals within companies can give information about business relationships as well as mergers, acquisitions and bankruptcies; to the extent that they possess knowledge about those issues, naturally. Collecting data in this way is likely to be limited to the companies represented by the respondents, and possibly companies related to the respondent's company, in order to uphold the quality of the information.

The longitudinal and retrospective aspects are a bit problematic when using individuals as the data source. First of all, employee turnover is an issue since the persons holding information about an event that took place several years ago might not still be employed by the company, and can thus be hard to get hold of (Gersick, 1991). Furthermore, the persons that were involved in the event many years ago may not remember it in detail. Mergers, acquisitions and bankruptcies can be sensitive topics, not least because of the high failure rate (Johnson, 2006) and there is thereby a risk for post-rationalizations and embellishment (cf. Silverman, 1985b) and interview data implies a risk for 'ego protection' (Welch, 2000). Studies of business relationships are likely to over-emphasise the stability if they do not take a longitudinal perspective (Gadde & Mattsson, 1987), which for example showed in

⁴ www.forvarv-fusioner.nu

⁵ www.adeqvat.se

⁶ www.mergermarket.com/public/default.asp?pagename=services_analysis

Welch (2000), where the studied business network was found “stable only in form and not in substance” (p. 201) when archival data was added to the interviewees descriptions.

Finally, turning to archival data sources, and news items in particular, reveals characteristics quite the opposite to using individuals as the data source. There are many different newspapers, trade papers and professional magazines that can be used for finding information about actors, relations, mergers, acquisitions and bankruptcies. The main advantage with this type of data source is that once the news items are written, they are quite easily accessible. Manual read-through of the physical papers is one option, using computerized databases is another. Whereas manual processing is very time consuming (cf. Rydén, 1971), the organized and searchable databases makes the access to archives of newspapers rather unimpeded. Finding good data archives, containing relevant information, and gaining access to it, is thus the first step in the use of this kind of data (Welch, 2000). This can be a troublesome issue if it concerns company records, where for example company policies regarding secrecy might be an issue, but is much easier for newspapers and magazines. For other archival materials, some organizations have collected archives containing business documents of different kinds for certain regions, industries or companies, for example the Centre for Industrial History (Centrum för Näringslivshistoria)⁷ and such archives can surely be useful for historical research.

Using news item archives as data sources enables access to information about a large variety of companies, relations, mergers, acquisitions and bankruptcies. The data collection is thus not limited to a certain number or type of companies, but the limit is set by the interest and work done by the used newspaper. The news items are naturally written for a purpose other than providing data for a particular study (Bryman & Bell, 2003); they are written to inform the reader of business events, for example mergers, acquisitions and bankruptcies or important deals made between companies. The researcher has no control over what information there is in the news items, the possibility to ask an attendant question to get more information is not available, and, partly because of this, using archival data is considered a time consuming procedure as it easily becomes an extensive detective work (Welch, 2000). So, making the news item data represent business networks and business network change, by providing information on actors, relations and mergers, acquisitions and bankruptcies requires considerable skills in interpreting, coding and organizing the data (Bryman & Bell, 2003). The large availability and easy access of news items should therefore not be interpreted as a sign of simplicity; news item archives offers great potential for extensive data collection, but should not be seen as an easy and simple data source (Welch, 2000).

The use of archive databases holding news items does not only enable the possibility to make computerized filtering and searches, but it also enables a

⁷ www.naringslivshistoria.se

collection of news items extending far back in time. Due to the excellent longitudinal coverage and retrospective integrity, archival data has been used for studies in business and economic history (Welch, 2000), for example of strategy formation (Mintzberg & McHugh, 1985) and organizational reorientation (Gersick, 1991). Keep, Hollander and Dickinson (1998, p.32) find “the usefulness of history as a means of searching for patterns of business behaviour and discovering ‘what really happened’ ” as a key feature of using longitudinal and historical data. Archival data cannot only be used to enable new approaches and findings, but also to improve the validity and reliability of case study research, which certainly makes it useful to many areas of research (Welch, 2000).

Retrospective coverage is one of the primary strengths of using this kind of data source, adding to the possibility of covering a relatively broad set of variables among a relatively large number of observations. The uniqueness of archival data is that the longitudinal data, i.e. data reflecting different points of time, can be based on information compiled and recorded at each respective time (Easton, 1995). News items are mostly written at the time of the story, which enables retrospective data collection but real-time data constructions (Pettigrew, 1990). As noted regarding the risk of embellishment in interview data, mergers, acquisitions and bankruptcies can be sensitive to discuss and post-rationalizations can be an issue. News items describing these types of events describe the story, statements and arguments at the time of the merger, acquisition or bankruptcy, which is the most interesting for understanding companies’ behaviour. An important characteristic of archival data is that it is unobtrusive and non-reactive (Bryman & Bell, 2003; Welch, 2000); the description of an acquisition printed in a news item will be the same whether it is read today or in ten years.

Since business relationships are considered to best be understood if seen over time, longitudinal archival data is very suitable for studies of business relationships and business networks (Easton, 1995). Contemporary records could be used to understand the long-term development of business relationships (Ford & Håkansson, 2006), and in this study, this means locating forces in the Swedish IT-related business network over time. The arrangement of the data in a time dimension is largely based on the dating of the mergers, acquisitions and bankruptcies, and the forces can thus be ordered in time from the information about when the event took place. Dating such events is a problematic issue, which will be discussed later in this chapter, but an approximate date can at least be found through the date of the news item.

5.3.3 The Quality of News Items

The wide coverage and large amount of data offered by the use of news items is exchanged for an inability to affect the information. News items can have varying contents depending on their purpose, and Smith et al (2001) describes two different kinds of news reports: episodic and thematic. The episodic reports, which are slightly more common, describe an event with information on what happened,

whereas thematic reports describe the ideas and ideology behind an event. Since the news items are written for another purpose than providing this study with data, the use of them is of exceptional importance. In this study, the news items found were reduced and coded manually by looking for information about mergers, acquisitions and bankruptcies involving at least one Swedish IT-company, information about some kind of relation of such a company, and information about any of the companies registered based on their involvement in an event or relation.

The information available in these sources might have been affected in several ways. As mergers, acquisitions and bankruptcies can be sensitive issues to discuss, there is a risk for modification of the data, a kind of embellishment (Silverman, 1985a). In addition to this, the original data has been interpreted by a journalist, and interpretations always carry the risk of distortion and omission. Silverman (1985a, p176) claims that “all data display cultural realities which are neither biased nor accurate but simply real” and continues “bias and accuracy [...] may arise only in the analysis of data not in the form or content of data”. Although Silverman’s ideas are not taken any further here, news items are, to some extent, the result of a journalist’s analysis and might, thereby, be biased. However, the information in the news items probably originates from some kind of press release or other kind of information from the companies involved in the event, unless they, for example, are based on rumours and speculation. This would mean that the information originates from the companies involved, which increases the substance of the information. The information given to the press may naturally have been altered by, for example, an involved company, which also is a problem when conducting interviews and most other kinds of data collection methods.

Mergers, acquisitions and bankruptcies are quite often mentioned in the media, and the business press is also likely to mention, for instance, some of the important customers and partners of the involved companies. There are however coverage issues, both from that fact that the press might only obtain the information that the companies are willing to give out, and secondly that the papers may be more or less inclined to write about such events (Rydén, 1971). It is possible that the media’s interest in mergers, acquisitions and bankruptcies among IT-companies has changed during the years studied. It is, for example, likely that the media has been more inclined to write about events involving IT-companies in periods when the public interest in the IT-sector has been greater. Even if the will to write about events exists, there is also an issue of how well the events are covered. This issue has in fact two parts; one is how well the events that are made public are covered, and the other is how well the events that actually occurred are covered (Rydén, 1971). Whether all events are covered or not is mostly of relevance if attempting to grasp the ‘whole’, or even ‘true’, situation. The objective of this study is, however, to capture a business network change sequence, and the coverage of the events in the news items is believed to be sufficient for that aim.

Welch (2000) considers the information in documents to be ‘harder’ evidence than the information from face-to-face personal interviews, and if so, that suits this

study's interest in rather rough accounts well. Some set their focus on the media and news texts and use them as the unit of analysis (cf. Neuendorf, 2002), for example studying how certain events are portrayed in the media (e.g. Hellgren et al., 2002; Tienari, Vaara & Björkman, 2003), but such issues are beyond the scope of this study. Concerning the quality and usefulness of the data, it is a question of whether or not the news items contain information on the issues this study builds on, and the trustworthiness of the information. Scott (1990, p.6) sets four criteria for assessing the quality of evidence, for example the contents of news items: authenticity, credibility, representativeness and meaning. The **authenticity** of a source concerns whether the information is genuine and the origin is undisputed (Scott, 1990). As long as a serious database, holding the news archives, is used, the actual news items are most likely to be genuine, i.e. they were published by the stated newspaper on the specified date. If going one step further, it is certainly hard to assess whether the content of the news item, for example a quote from the CEO of a company, really traces back to the alleged CEO and was literally represented. Furthermore, the source of information in a news item is not always specified, which makes the origin of the information in news items quite hard to assess (Bryman & Bell, 2003).

The **credibility** of information depends on the level of errors and distortion of it. As has already been discussed, the quality of the longitudinal coverage and retrospective integrity is promising. However, the contents of a news item can be distorted for many reasons; perhaps the information behind the news item has been garbled in order to make a company appear better or worse (Ohl et al., 1995), or perhaps to make the news more attractive for potential readers in an attempt to raise the number of readers. The possible tampering of the information presented in news items have received the interest of some research aiming at revealing errors in the media (Bryman & Bell, 2003), but that is not the purpose of this study. Several news items can describe one merger, acquisition or bankruptcy, thus increasing the credibility of the information (Welch, 2000), somewhat similar to triangulation, i.e. using insights from various viewpoints to check for consistency and agreement (Keep, Hollander & Dickinson, 1998).

Representativeness addresses the generalizability of the information, i.e. if it represents what is typical. This is rarely an issue when using news items, as it is hard, if not impossible, to establish the population and sample (Bryman & Bell, 2003), which in this study would be companies or events. Which mergers, acquisitions and bankruptcies are covered in news items is naturally highly dependent on the companies' tendency to announce them combined with the newspapers willingness to devote space to such articles, but this is acceptable since this study is not an attempt to cover all mergers, acquisitions and bankruptcies. Another way to regard the representativeness is to relate the documents used to the totality of relevant documents (Scott, 1990), but that implies an interest in the documents per se, which is not the case in this study.

Finally, the **meaning** of news items is a question of interpretation and this is where the coding of the data, described in section 5.5, becomes important. Bryman and Bell (2003) consider news texts to usually be clear, but they stresses the importance of being aware of contextual factors. As this study looks for rather concrete information, this dubiousness is believed to be relatively manageable. There is, naturally, a need to assess the information in the news items with caution, but the usability of the data is improved by making the classifications in the coding phase quite rough. By taking these measures, and considering the intended use of the data to give a picture of events and business networks rather than any kind of complete description, mabIT will probably be precise enough.

5.4 Reducing Data

Whereas the last section concerned the data source at a very general level, discussing advantages and disadvantages with such a data source, this section is a concrete account for the specific sources and delimitations used in the main data collection. There are enormous amounts of news items, and effective reduction is absolutely necessary in order to make the data collection manageable. Therefore, the steps towards reducing it to a manageable data set are described here. At a later stage, some other sources have been used to complement this main data collection, but they will be described later.

5.4.1 Specification of News Papers

The news archive in the database Affärsdata⁸ has been used to gain access to different newspapers and magazines. Its archive covers 75 printed sources and 857 web-based sources, both Swedish and international (Affärsdata, 2007-07-04). Using all these sources is naturally not manageable, so three specific sources have been selected: one regional newspaper, Upsala Nya Tidning (UNT), one business section of a national newspaper, Svenska Dagbladet Näringsliv (SvD), and one professional paper, Computer Sweden (CS). These have been chosen to cover different types of newspapers and are all considered serious and established. To further limit the amount of news items, a ten year period, covering the years 1994-2003, is focused upon as this period corresponds well to the presumed turbulence among Swedish IT-companies. Also with these delimitations, a substantial number of news items are obtained. A total of 125 546 news items were found in the database from the selected papers during the ten included years, and the distribution among the papers and years⁹ is shown in Figure 5.2. As the graph shows, there are no news items from UNT in the database before 1998.

⁸ www.affarsdata.se

⁹ Search string: 'datum8: [YEAR]* and kalla_namn: ("[SOURCE]")'
where [YEAR] and [SOURCE] were changed for the respective year and source

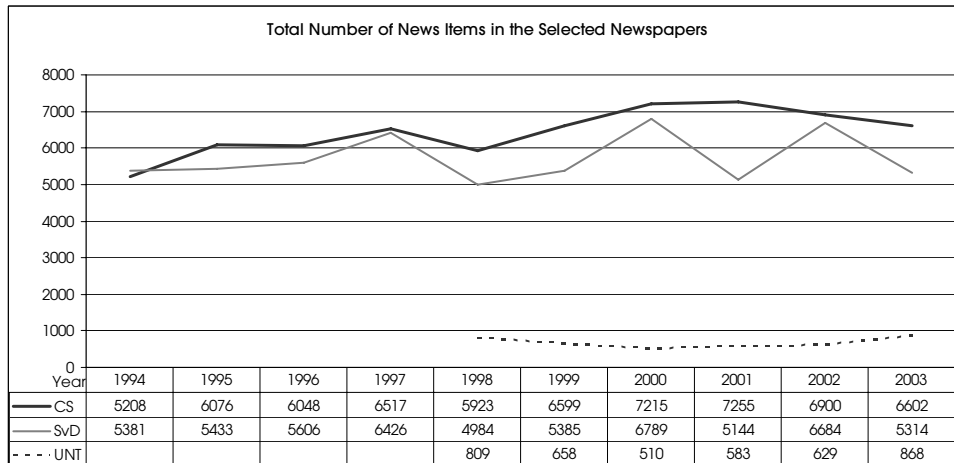


Figure 5.2 The total number of news item in the three selected newspapers
Showing the collection of Computer Sweden (CS), Svenska Dagbladet Näringsliv (SvD) and Upsala Nya Tidning (UNT) held by the database Affärsdata.

Using all these news items is hardly manageable, as they would take too much time to process. However, using a computerized database not only enables easy access to large amounts of news items, but it also enables the researcher to make computerized searches. The eight years Rydén (1971) spent completing his study of mergers and acquisitions by manually going through newspapers could most likely have been reduced by using an article database and the technology of today.

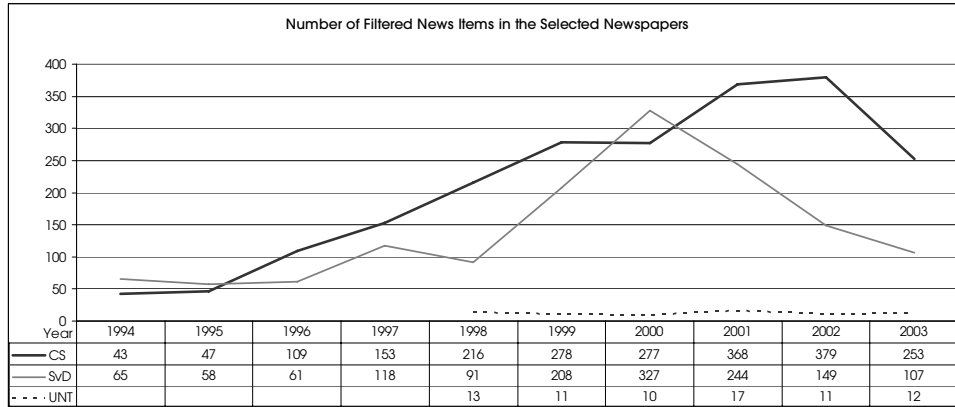
5.4.2 Filtering through Search Terms

A set of search terms have been used to reduce the number of news items, and more precisely to narrow them down by finding those that are more likely of relevance to this study. This operation means filtering out the news items that do not match the search terms, which naturally sets high requirements on the selection of search terms. Strict filtering saves manual work, as irrelevant news items are removed, but also carries the risk of excluding news items that are of high relevance, and this balance must be acknowledged. Following the study's focus on mergers, acquisitions and bankruptcies, one part of the computer-aided filtering aims at finding news items describing such events. Therefore, the Swedish words for *mergers*, *acquisitions* and *bankruptcies*, in different word forms, were used as search terms in a way that at least one of these must be mentioned. However, the study is also limited to such events that include Swedish IT-companies, and this aspect is handled through requiring that the word *IT* is mentioned besides one of the other search terms¹⁰. The nationality of the involved companies is not addressed by the

¹⁰ The complete search string is: '((it) and (konkurs or nedläggning or fusion or förvärv or uppköp or sammansl or sammangå or samgå)) and datum8: [YEAR]* and kalla_namn: ("[SOURCE]"))' where [YEAR] and [SOURCE] were changed for the respective year and source

search terms, but the fact that all the papers are Swedish is in itself seen as a filter increasing the probability of finding information about Swedish events.

After conducting this search, a more manageable amount of 3625 news items remained. Figure 5.3 shows the distribution of these remaining articles, and as is shown, Computer Sweden is the main source with 2123 items. The graph also shows that the regional paper Upsala Nya Tidning is a minor source of news items to this study.



*Figure 5.3 The number of filtered news items
Narrowed down to the selected newspapers and with the used search terms
applied through the article database Affärsdata.*

Due to the relative flatness of the curves representing the total number of news items in Figure 5.2, the relative amount of filtered news items resembles the absolute amount quite well. The filtered news items as a share of the total numbers are shown in Figure 5.4. This figure thus describes the numbers in Figure 5.3 in relation to the numbers in Figure 5.2. Notably, the share of filtered news items is quite low, but seems to increase over the years, which could indicate an increased interest from the newspapers to write about mergers, acquisitions and bankruptcies.

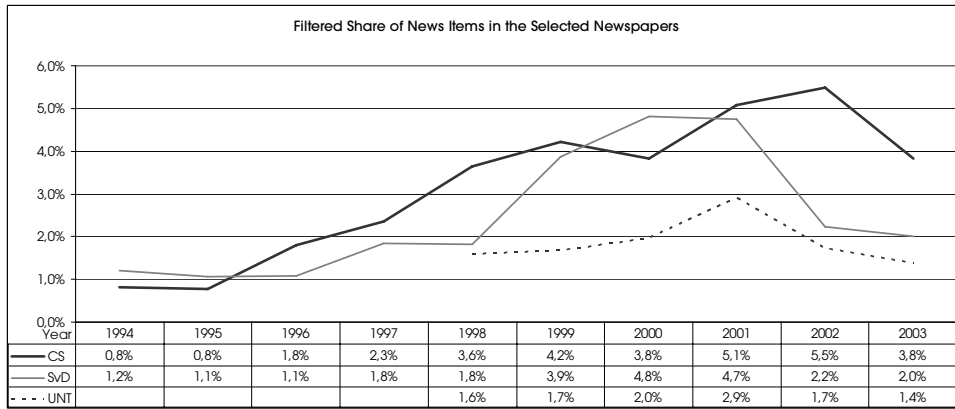


Figure 5.4 Filtered news items relative to the total number of news items

Whereas the last two figures show the distribution over the studied years, Figure 5.5 below shows the distribution of the news items over the months, i.e. within the years, of the news items from Computer Sweden, covering all ten years. As the graph shows, the distribution of the filtered news items corresponds well to the distribution of the total amount of news items. This will not be analysed further, but it is worth noting the large dip during summer, probably due to lower activity following summer vacation, and the discrepancy between the two sets of news items during March-April, which could be related to the publication of financial results.

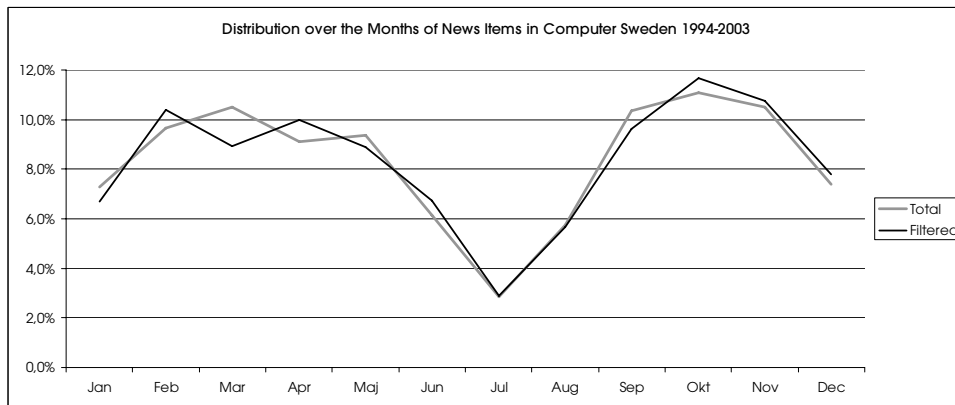


Figure 5.5 Distribution of news items over the year
 Showing a monthly distribution of the year of news items in Computer Sweden 1994-2003, from searches in the database Affärsdata

Still, after filtering by using search terms, the 3625 news items that remain are a quite large amount to deal with. Not all of these are necessarily relevant for the study, for example news items containing stock market analyses that vaguely speculate about mergers and acquisitions, stories about business people or news items concerning foreign companies. Which news items are relevant to this study are judged in a manual read-through, and are decided by the stipulated aspects on which the study is based. These aspects are collected in what is here called a ‘coding scheme’, further described in the next section. However, the basic criteria for considering a news item to be relevant is that it must describe an actor, relation, merger, acquisition or bankruptcy, but the inclusion of actors, relations and acquisitions is naturally not unconditional. As was described earlier, the basic criterion for inclusion of the events is that at least one of the involved actors is a Swedish IT-company. The actors included in this study must either be involved in such an event, or be related to an actor that is involved in such an event. The types of relations that are considered relevant are all focused on business, but can be of varying kinds, such as business relationships between a buyer and seller, cooperative partnership relations or ownership relations. Concerning time, the events included in this study must have taken place during the period 1994–2003, which to a large extent is covered by the delimitation of the news items used. After manually reading the news items and judging the relevance of each of them, a relevance ratio can be calculated. Figure 5.6 below shows the relevance ratio for Computer Sweden, i.e. the number of relevant news items divided by the number of filtered news items. The year 2003 is unfortunately omitted from this figure as the relevance of the news items were not marked during the read-through and coding of that year, which was the first year processed and a relevance marking routine was not implemented until after processing these news items.

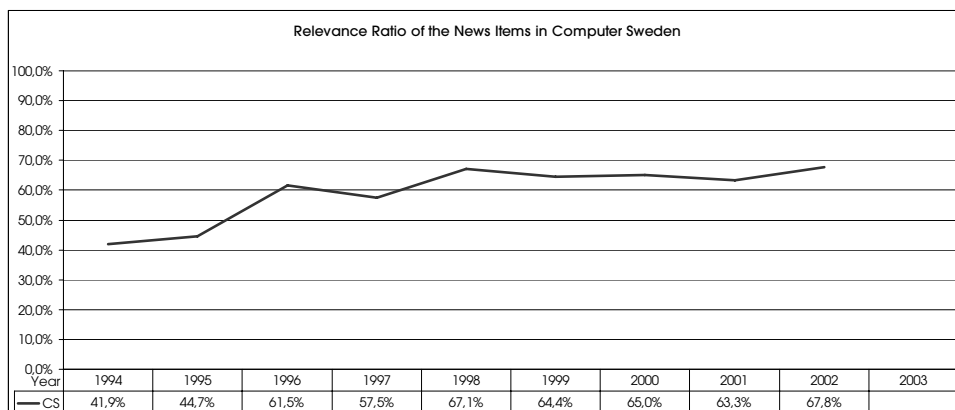


Figure 5.6 *The relevance ratio of Computer Sweden*
 Calculated as the number of relevant news items divided by the number of filtered news items. Data for year 2003 is not available.

The steady increase in the usability of the filtered news items is interesting to notice. Without looking further into the issue, it can partly be related to the increased experience of the assessment and coding, but the increase is not fully corresponding with the order in which the years were processed, so there are probably also other factors involved in these variations. However, the average relevance ratio is 63.5%, which means that almost two out of three news items remaining after the search term filtering were usable to the study. Despite the lack of opportunity to make a comparative analysis, the obtained ratio is believed to be quite good.

5.5 Coding Data

After finding and reducing input data, there is still a great deal of work to do to make it usable to study business network change. Although the labels of later stages of the data structuration technique are signalling that they deal with analysis, the kind of coding of the data made in this stage is an early analysis of the data, with the aim to reduce it (cf. Miles & Huberman, 1994). Its purpose is to sort the material in a meaningful and systematic order, to assist the directed analysis of the data (Welch, 2000), and this will be done by creating meta-data, i.e. data describing the input data. The meta-data makes up a simpler version of the contents of the news items, which is more relevant to the study, and it is the meta-data that will be used in the subsequent stages of analysis, not the news items per se.

The systematic structuration of data can for example be done by sequencing, i.e. placing events in a meaningful order, such as chronological or stages, or patterning, i.e. synthesizing the data according to theoretically or empirically given categories (Welch, 2000). The data structuration technique in this study actually uses both these types of ordering; the data is coded in both time and categories. Of outmost relevance to the data structuration technique is the ‘coding scheme’, which is a number of preset variables governing the structuration (Neuendorf, 2002). Unlike, for example, Rydén (1971), a description of the coding procedure of this study will be given, and this description will be quite detailed. Smith et al. (2001) uses what they call a “codebook”, governing their analysis of newspaper texts, and that is something similar to this coding scheme; a specified set of categories guiding the coding of the data. The coding scheme used in this study is divided into three classes, events, actors and relations, and the used variables will be described next.

5.5.1 Event Variables

The first class of information concerns the events. Mergers, acquisitions and bankruptcies are central to this study, which makes this part of the data of outmost importance. A number of variables concerning the events are coded, and a list of these variables is showed in the picture to the right. To start with, the actual text from the news item, describing the event, is registered

Event
text
source
category
date
involvement
registration-data

and stored, and so is the source of the text. This helps the operator during the registration of the event, but also enables verification and further coding at a later occasion. It is possible to include more than one text to each event since it is thinkable that the specific event is described in more than one news item, which adds to the substance of the information.

An important variable concerning the event is the category, i.e. what type of event it is. At the coding stage, quite a wide range of events are included and subsequent analyses may well reduce these types to a smaller number. The different categories of events that are used in the coding stage are: *acquisition*, *bankruptcy*, *closure*, *failed acquisition*, *failed merger*, *merger*, *partial acquisition and outsourcing*, *potential acquisition*, *potential bankruptcy*, *potential merger* and *transformation*. Some of these event categories might not be obvious and some explanation could therefore be beneficial. Failed acquisitions and mergers are, just as they sound, events reported as failed attempts to consolidate two companies. These categories are mostly used to reclassify events that later are found to be cancelled. Partial acquisitions seem to be quite common (cf. Larsson, 1990) and are consequently also included as a category in mabIT. Acquisition through an outsourcing contract, where one company takes over a function of the other, can be separated from ordinary acquisitions as these events may be different from a business network change perspective. This type of events occurs when a part of a company is bought by another company, with the main objective of continuing to serve the original company. All the categories on 'potential' events are used to indicate that an event is either announced or explicitly desired by one part. It is possible that such speculations in advance will affect the outcome, which could be a question for future studies. Transformation is not really an event causing structural change, but it is used to follow companies when they, for example, change names, and will thus not be counted as an event when focusing on mergers, acquisitions and bankruptcies. It is sometimes difficult to distinguish a merger from an acquisition, especially since they are often treated synonymously in the news items, but whenever a news item refers to an event as a merger, it is also coded as a merger. If, however, the event is at any point called an acquisition it is most likely to be an acquisition rather than a merger, and is consequently coded as an acquisition.

Including an indication of time is central to enabling longitudinal analysis, and in this coding scheme, time is represented by an approximate date when the event occurred. Deciding the date of an event is sometimes difficult, and Rydén (1971, p.36) lists as much as 12 thinkable ways to date a merger or acquisition. The dating of events will have to be based on either explicit information in the news items or on the publishing date of the news item. The available information about the time and date, in combination with the ambiguous dating of the events, calls for a pragmatic and rather rough handling of the date aspect. Therefore, an estimation of the date of the event will be used and to the extent possible, the dating will be specified to a level of year and month of the event. When specified in the text, e.g. when referring to an event that "took place last April", that date will be used, but

otherwise the year and month of the first news item mentioning the event will be used. The subsequent analysis will be able to reduce the temporal resolution in order to limit the nuances of the dating, for example to cover full years.

After registering an event, the actor or actors involved should be connected to the event. This is done by using a list of already registered actors, or adding a new actor, and an involvement is registered by connecting the selected actor with the event. In this way, the coded data on events and actors is interlinked, which creates a coherence of the data and makes it analysable in many different ways. Furthermore, the role of the actor in the event is specified, and this is naturally closely related to the categories of events that were previously listed. Some of these involvement roles, just as the event categories, can be consolidated if the analysis requires a reduced number of alternatives, but a more detailed classification holds the possibility of a finer analysis. So, to cover many possibilities, a number of different roles have been used: *bankrupt, being bought, buying, closed, established, in crisis, merging, partially merging, potential buyer, potentially being bought, potentially merging, selling* and *transformed*. There is also the possibility of adding a description of the involvement and marking the involvement for further investigation. Finally, returning to the event variables, some registration data is also included. This is rather basic information, such as when and by whom the event was registered or modified, and there is also a possibility to flag, and comment on, uncertainties that require additional attention, through an uncertainty scale from 0-9.

5.5.2 Actor Variables

The actors are also central to this data set, as they are what make mergers, acquisitions and bankruptcies occur and they are the parties that interact in relations. Actors are thus one of the main classes of variables in the coding scheme. The actors are identified as they are mentioned in news items as either being involved in a merger, acquisition or bankruptcy, or in some kind of relation to a company that is already known and registered. Natural questions to consider are what defines an actor, and how an actor is identified in the news items. For example, should the headquarters and its subsidiary be treated as one common or two separate actors? According to Forsgren, Holm and Johanson (2005, p.24), "a business firm is an entity engaged in business activity". If the subsidiary is explicitly mentioned in a news item, being involved in events and relations, it is believed to behave as an actor separate from the headquarters. In line with this view, a subsidiary is treated and coded as a separate actor if it is mentioned as being part of an event or as being related to another actor.

Each found actor is thus registered, and by using a separate list of actors, data redundancy is avoided while it at the same time increases the inter-linkage of the data, enabling the possibility to follow an actor through all its involvements in different events and relations. First, the name of the actor is registered, and the dates when the actor was started and ended are noted if such

Actor
name
start date
end date
product type
nationality
characteristics
description
registration-data

information is available. For example, the bankruptcy of an actor generally means that it ends.

Of significance to this study, following the suggested analytical model, is the product type of the actors. There is an opportunity to register this as a classification code following the Swedish Standard Industrial Classification system, which resembles NACE within the European Union and SIC (-1997) and NAICS (1998-) in the US (Carlsson & Paulsson, 2006). However, as the specification of the intended analysis stated (see section 4.3.3.2), four main product types will be handled in this study. These are *IT goods*, *IT services*, *IT various* and *non-IT*, and a corresponding categorization of the actors is consequently made.

Although not emphasized in the analysis of this study, the nationality of the actor is also registered, which allows analysis of international aspects. The nationality of actors could be considered of minor importance as the borders of nations are somewhat of a demarcation rivalry to business networks, but a business network approach has shown useful for understanding international business and part of its origin is actually in research on the internationalization of business (e.g. Blankenburg Holm, 1996b; Forsgren & Johanson, 1992; Håkansson, 1982; Johanson & Vahlne, 1990). So, to enable the opportunity of including national aspects in the analysis of mergers, acquisitions and bankruptcies, which for example Rydén (1971) did, the nationality of each actor can be registered. It can sometimes be difficult to decide the nationality of an actor, for example if it is a subsidiary to a foreign company. This limitation makes the nationality less interesting, or at least more complicated, to analyse. Some other characteristics of the actors are also included in the coding scheme, but are not used in this study's analysis. This kind of data can be registered at many different times, which provides an opportunity for following the development of an actor in terms of, for example, growth or decline. The characteristics data is registered with an approximate date, what aspect the statement concerns, the actual figure, a comment and the usual registration-data. The kinds of characteristics that can be registered are not restricted, but the aspects primarily intended are *customers*, *employees*, *locations*, *profit* and *turnover*.

All of this data might not be accessible from a single news item, but it is possible to complement the data afterwards either from more news items or from other sources. Furthermore, a general, free text, description of the actor can be included to enable the registration of information not covered by the used variables, which might be useful for later recoding or other usage. Registration-data such as the operator that registered or modified the company is included, as well as a time stamp. Finally, also the actor-related data includes a possibility to set an uncertainty flag and comment the need for further investigation.

5.5.3 Relation Variables

To enable the intended analysis of business network change, the data must also include a class of variables aimed at capturing business relationships and other types of relations between the included actors. As was shown in the description of

business relationships in Chapter 2, business relationships are something special and not all interactions and exchanges are necessarily business relationships. As have been made clear, this study does not look deep into the characters of the relations and thus settles with finding indications in the news items that two actors are related in some way, which includes business relationships as well as other types of relations. So, different kinds of relations can be registered in mabIT by connecting two actors. A variety of different relation types are conceivable and an adaptable list of different types offers flexibility in the analysis and offers the opportunity to, for example, ascribe different characteristics to the different types of relations. The relation types that have been used in the coding stage are *competitor*, *customer*, *distributor*, *owner* or *part-owner*, *partner* and *supplier*.

Relation
type
actors
start date
end date
description
registration-data

A relation is, in this data, seen as a dyadic interaction, and does thus not include triadic relationships (cf. Havila, Johanson & Thilenius, 2004). The coding of relations therefore also includes references to the two actors involved in the relation. Just as for the involvement in events, the involvement in a relation uses the list of registered actors, which makes the data interrelated and avoids redundancy. Relations are changeable over time, so the approximate date when the relation started, or at least the earliest date when its existence is known, and when it ended is important to note whenever such information is available. Finally, also this part of the coding scheme includes a possibility to register a free text description of the relation, mark the uncertain relations for later analysis, and some data on registration operator and time. An extensive use of the opportunity to register relations should enable mabIT to address the business network aspect in subsequent analysis.

5.5.4 Guided Coding in the mabIT Software - An Example

As has been shown, there are quite a number of different variables and aspects that are included in the coding procedure. Managing a stringent procedure is important to uphold the quality of the coded data, and to assist in the practical coding, the mabIT software contains a series of guides, which makes coding easier. The mabIT software also manages the storing of the coded data, but these aspects of it will be described later. This part will focus on the mabIT software as a user-end tool, and will show pictures from its web-based user interface. The custom-made user interface can be modified if the needs or requirements change, and an important objective of the interface is to facilitate the coding and to make the coding more consistent. A web-based implementation of the software was chosen to enable easy access irrespective of the location of the operator, while still centralizing the administration, development and data storage. It also enables several operators to work simultaneously in mabIT, although the use of that feature has been very moderate and this study's main researcher alone has made almost all of the data processing.

Although the coding scheme has been described quite in detail, an example of the application of the coding scheme will be given, and this also gives a description of the coding guides in the mabIT software. After performing searches in the way described in section 5.4, the resulting news items have been saved in a text document for the manual read-through and coding. When reading the news items, the parts that are believed to hold relevant information that should be coded are marked and then coded via the web-based guiding interface. If on the other hand nothing in the news item is found to be relevant to the study, the news item is marked in a way that indicates the lack of relevance. Below is an example of a news item, both the original in Swedish and translated to English, where the parts considered relevant for coding have been marked.

Computer Sweden 2001-04-25

Sigma köper IT företag

1 IT konsulten Sigma köper Datorex Nova från Bollnäs för 14.7 miljoner kronor. Sigma tar
2 därmed kontrollen över 180 företag inom detaljhandeln som idag använder sig av
3 e-handelsystem från Datorex Nova

4 Dataföretaget Datorex Nova utvecklar och säljer informationssystem inom fackhandeln.
5 Företaget har 22 medarbetare och beräknas i år omsätta 16 miljoner kronor. Bland
6 kunderna finns bland andra MQ, Levis och Filippa K. Totalt använder 180 företag med
7 190 butiker i åtta länder produkter från Datorex.

8 -Genom förvärvet tillförs Sigma unik kompetens inom butiksdatabaser. Tillsammans
9 med vår satsning på e-handelsystem skapar detta nya möjligheter för våra kunder,
10 säger Sune Nilsson, affärsområdeschef för Sigma e-solutions som efter koncernens
11 delning i tre fokuserade börsbolag blir nya Sigma AB.

12 Köpeskillingen uppgår till 14.7 Mkr och Sigmas goodwillpost beräknas öka med ca 8 Mkr
13 och skrivs av under en 10-årsperiod

----- English translation -----

Computer Sweden 2001-04-25

Sigma Buys IT-Company

1 The IT-consultant Sigma is buying Datorex Nova from Bollnäs for 14.7 million SEK.
2 Sigma, thereby, takes control of 180 companies in the retail trade that are
3 currently using e-trade systems from Datorex Nova.

4 The computer company Datorex Nova develops and sells information systems within the
5 retail trade. The company has 22 employees, and this year's estimated turnover is 16
6 million Swedish kronor. Among its customers are MQ, Levis and Filippa K. In total, 180
7 companies with 190 stores in eight countries use products from Datorex.

8 -Through the acquisition, Sigma obtains a unique competence within retail computer
9 systems. Along with our concentration on e-trade systems, this creates new openings
10 for our customers, says Sune Nilsson, manager of the business unit Sigma e-solutions
11 which, after the group's split into three listed companies, becomes the new Sigma AB.

13 The purchase-sum is 14.7 MSEK, and Sigma's goodwill post is estimated to increase by
14 about 8 MSEK, and will be written-off in a 10 year period.

The text concerns an acquisition where Sigma is buying Datorex Nova (according to row 1). The first task is to register it as an event via a guide of four steps, shown in the first series of pictures below. The pictures are intended to show the general idea of the software tool and coding procedures, so all details of the software will not be commented on. In the first step of the guide, shown in Figure 5.7, the text from the news item is inserted in the textbox labelled 'Description', and the source is specified along with the date of the source (Computer Sweden, 2001-04-25). In order for the pictures not to take up too much space, the news item text has been reduced. The inclusion of the news item text ensures that the original text is saved for future use, for example, verification or extension of the coding. Throughout the steps of the guide, the news item text will be shown adjacent to the forms, to enable the operator to look at the original text when entering the required information.

The screenshot shows a window titled "Operator 1" with a close button. The main heading is "New event, step 1". Below this is a "Description:" label followed by a text area containing the text: "Sigma köper IT företag", "IT konsulten Sigma köper Datorex Nova från", and "Bollnäs för 14,7 miljoner kronor [...]". Below the description is a "Source:" label with a text field containing "Computer Sweden - 20010425 (id: 2013899)". This is followed by a "Source date:" label with a text field containing "20010425". Then, a "Date of the event: (approximate)" label with a text field containing "200104". Below this are two columns: "Type of event:" with a list box containing "acquisition", "bankruptcy", "closure", "failed acquisition", and "failed merger"; and "Involved actors:" with a list box containing "1", "2", "3", "4", and "5". At the bottom left are "Reset" and "Next->" buttons. At the bottom center is a "[close this window]" label.

Figure 5.7 The first step in the guide to register a new event

Furthermore, an approximate date of the event is entered, in this case the year and month of the news item (200104). What kind of event it is judged to be is selected from a list of the different types of event, and in this case, it seems to be an acquisition. The number of actors that are involved in the event are also specified, two in this example, in order to prepare for the second step of the guide.

In the second step, shown in Figure 5.8, the name of each actor involved in the event is entered, and their respective role in the event is selected from the drop list. In this example, Sigma was the buyer and Datorex Nova was being bought. The original news item text is presented to remind the operator of the actors.

Figure 5.8 The second step in the guide to register a new event

The complete name of the actor is not required as the third step of the registration guide searches the actors already registered for similarities with what was entered in the second step. In step two, only “Datorex” was written as the name of the second actor, but the third step of the event registration guide matches the entered names of the actors with similarities from all the previously registered actors, which means that the third step suggests the already registered company “Datorex Nova”. If the event really involved a company called “Datorex”, a new actor with that name could be created by selecting the textbox containing that name. However, in this example, both the involved actors were already registered and are thus selected in order to avoid duplicate registrations. The third step of the event registration is shown in Figure 5.9.

Operator 1 > Event 1464 [close]

New event, step 3

Please choose which of the following actors that are involved in the **acquisition!**

Actor 1 (buying) Select:

Sigma

Sigma nBit

Sigma (new)

Actor 2 (being bought) Select:

Datorex Nova

Datorex (new)

[close this window]

Figure 5.9 The third step in the guide to register a new event

When reaching the fourth step of the guide, shown in Figure 5.10, the necessary data has been collected and the event registration is completed. The fourth step summarizes the registered information about the event and provides links to specify additional information about the actors, their characteristics and relations.

Operator 1 > Event 1464 [close]

New event, step 4

The event has been successfully registered!

Involved actors

Actor	Role	Relations	Characteristics
Sigma	buying		..■
Datorex Nova	being bought		..■

Description

Sigma köper IT företag
IT konsulten Sigma köper Datorex Nova från Bollnäs för 14,7 miljoner kronor [...]

Event no	1464
Type of event	acquisition
Event date	200104
Registration date	2007-07-05 18:11:16
Registrating operator	Peter Dahlin

[close this window]


Figure 5.10 The fourth and final step in the guide to registering a new event

The guide for registering events is, naturally, central to the coding procedure, and besides that guide, two other parts of the software tool are essential to the coding, namely the event page and the actor page. After the event has been registered, data can be added and changed through a page displaying the details of an event, shown in Figure 5.11 on the next page. Starting from the top, the text from the news item originally used to register the event is shown, and thereafter follow the links to additional descriptions that have been added. Below is some general data on the event, such as the approximate date of the event, the type of event and a chance to mark any uncertainties that need to be investigated at a later occasion. Finally are the involved actors, their roles, comments on their involvement and an uncertainty flag, as well as the chance to add more actors to the event.

Similar to the event details page, there is a page describing the registered information on a particular actor. This is shown in figure 5.12, and besides the basic data that can be specified, such as the name, organization number, product type, SNI-code (Swedish Standard Industry Classification code), and when it started and ended, there is a chance to include some text describing the actor. The nation of the actor is also shown here along with data on the registration and modification of the actor, as well as the uncertainty mark. Furthermore, there are links to edit the relations and characteristics of the current actor, and finally there is a listing of all the events in which the actor is involved. The news item in the example shown earlier contains some information on the actors as well as relations. Row number one in the example describes Sigma as an IT consultant company, which thus is selected as the property of Sigma. It also states that Datorex Nova is based in Bollnäs, which reveals that it is a Swedish company, thus giving the nationality. Rows four to five describe Datorex Nova as a developer and retailer of information systems for specialized retailers, thereby giving information on their type of business, so the product is set to 'IT software', in accordance with the precisions of the product types as was described in section 4.3.3.2.

Operator 1 > Event 1464 [close]


Edit Event no 1464

← Previous event Event: 

Sigma köper IT företag
IT konsulten Sigma köper Datorex Nova från Bollnäs för 14,7 miljoner kronor [...]

Source: Computer Sweden - 20010425 (id: 2013899)
Source Date: 20010425

Additional descriptions:

Date	Source	View	Edit	Delete
20010425	Computer Sweden - 20010425 (id: 2013909)		[edit]	X



Event date:

Type of event:

Uncertainty level:

Uncertainty comment:

Registered by: Peter Dahlin, 2007-07-05 18:11:16

Involved actors	Role	Role Comment	Modify
Datorex Nova	Role:	<input type="text" value="being bought"/>	
	Role Comment:	<input type="text"/>	
	Uncertainty:	<input type="text" value="5"/>	X
	Unc comment:	<input type="text"/>	
Sigma	Role:	<input type="text" value="buying"/>	
	Role Comment:	<input type="text"/>	
	Uncertainty:	<input type="text" value="5"/>	X
	Unc comment:	<input type="text"/>	

Add actor:

[close this window]

Figure 5.11 The page presenting details of an event

Operator 1 > Event 1464 [close]

Actor Information

← Previous Actor Actor: Next Actor →

ID	1006
Name	<input type="text" value="Datorex Nova"/>
OrgNo	<input type="text"/>
Product type	<input type="text" value="IT software"/>
SNI-code	<input type="text"/>
Started	<input type="text"/>
Ended	<input type="text"/>
Information	<input type="text" value="Bollnäs"/>
Nation	<input type="text" value="Sweden"/>
Registered by	Peter Dahlin, 2007-07-05 18:11:16
Uncertainty level	<input type="text" value="5"/>
Uncertainty comment	<input type="text"/>
Relations	>>Edit relations <<
Characteristics	>>Edit characteristics <<

Involvements:

Eventid	Date	Type	Actors role	Other Actors
1464	200104	acquisition	being bought	Sigma

Involved in 1 event

[<-- Go back](#)
[close this window]

Figure 5.12 The page presenting details on an actor

Some relations are also mentioned in the example news item, in row six. The actor information page links to a page handling relations of that particular actor, shown in figure 5.13. That page shows when the relation started and ended, if such information is known. Then follows a specification of the actors and their relations, in the form of **Actor A** is *what* to **Actor B**. There is also the opportunity of commenting and describing the relation, for example, by inserting the text from the news item describing the relation, and also here is an opportunity to flag for any uncertainties. The bottom of the page allows a new relation to be added, which is made through a guide.

Three of Datorex Nova's customers are mentioned by name, these are MQ, Levis and Filippa K, and three relations can, thereby, be registered. In order to begin to register a relation, two aspects must first be specified: Datorex Nova is *what* to *whom*? The example would be that Datorex Nova is a *supplier* to *MQ*. Whether a relation is registered as, for example, Datorex Nova is a supplier to MQ, or MQ is a customer to Datorex Nova does not matter. In this case, it is natural to manage the relations of Datorex Nova, which means that the relations are specified from Datorex Nova's point of view. In addition, when registering relations between actors, the previously registered actors are used to avoid duplicates. Just as in the event registration, the previously registered actors are searched for similarities with the entered name of the counterpart. If the intended actor is found it is used, and if not, a new actor is created. The relation can be described by inserting the text that described the relation and a reference to the source. Approximate dates when the relation started and ended should also be specified, if such information is available. In this example, all that is known is that the relation existed at the time the article was written, which means that the relation was established before, and not ended until after, April 2001.

Operator 1 [close]

Edit Relations

These are the relations of Datorex Nova:

Start	End		Comment	Unc	Edit/Del
<200104	>200104	Datorex Nova is a supplier to MQ	Bland kund...	1	[edit] ✕
<200104	>200104	Datorex Nova is a supplier to Levis	Bland kund...	1	[edit] ✕
<200104	>200104	Datorex Nova is a supplier to Filippa K	Bland kund...	1	[edit] ✕

Add new relation:

Datorex Nova is to

[close this window]

Figure 5.13 The page handling the relations of an actor

Besides the relations, there is a page handling the characteristics of an actor, shown in figure 5.14 below. This page resembles the relation page, and the information here is an approximate date of the characteristic, the type of characteristics and a number describing the characteristic. Similarly to the relation page, a comment on the characteristic can be added as well as a mark for uncertainty, and the bottom of the page contains the opportunity to add new characteristics. Some characteristics of Datorex Nova is given in the exemplifying news item. Row five to six, in the English translation, reveals that there are 22 employees in Datorex Nova and has an estimated turnover of 16 million Swedish kronor in 2001. Both these

characteristics are entered in mabIT with an approximate date of the specifications (200104 for the employees and 2001 for the turnover). Since the turnover was an estimate, the uncertainty marker is set to seven to call for caution when using the number. Rows six-seven state that there are about 180 companies using Datorex Nova's products, which also can be specified as a characteristic of the company.

Operator 1 > Event 1464 [close]

Edit Characteristics

These are the characteristics of Datorex Nova:

Date	Type	The number	Comment	Uncertainty	Edit/Delete
2001	Turnover (SEK)	16000000	Företaget har 22 medarbetaer o...	7	[edit] ✖
2001	Customers (number of)	180	Totalt använder 180 företag me...	1	[edit] ✖
200104	Employees	22	Företaget har 22 medarbetaer o...	1	[edit] ✖

Add new characteristic:

Approximate Date:

Characteristics Type: Profit (SEK)

The number:

Comment:

Uncertainty level: 5

Uncertainty comment:

[close this window]

Figure 5.14 The page handling the characteristics of an actor

That completes the guided coding procedure of the exemplifying news item, but the mabIT software contains more features. One of those is the ability to conduct searches. Both the actors and events can be searched through a number of variables and terms, shown in figure 5.15. There are many conceivable ways of searching the structured data, and more ways can be added. Some of these search modes require various kinds of calculation, for example, the search for events with certain number of involved actors and the search for actors with certain number of involvements in events. As has been pointed out, the interface of the mabIT software tool is highly adaptable and can be modified depending on the requirements. This section's exposition of the current web-based user interface can, however, give an idea of the software tool and the mode of operation during the structuration.

The figure displays two screenshots of the mabIT software interface. The left screenshot shows the 'Search event' window, which includes a 'Selection' column with radio buttons for various search filters (e.g., 'Show all events', 'Show all from category: acquisition', 'Show all events registered by user: Peter Dahlin') and a 'Criteria' column with corresponding input fields and dropdown menus. The right screenshot shows the 'Search Actor' window, featuring a 'Quick Search' section with an 'Actor name' input field and 'Search!' and 'Show all' buttons, and an 'Extended Search' section with a table of criteria and selection options (e.g., 'Organization no:', 'Product Type: 1_IT service', 'Nationality: Australia', 'Registered by user: Peter Dahlin').

Figure 5.15 The opportunities to search for events and actors respectively

5.6 Storing Data

The coded data must naturally be stored somewhere, and the mabIT software is more than a set of coding guides, although that is perhaps the most prominent function. Storing data also means arranging it in a useful way, which in this study means that it should be possible to use the coded data to produce various sets of analysable data directed towards the research questions and the analytical model.

As has been indicated in the description of the coding scheme, the coded data is quite interlinked, e.g. the connection between actors through events and relations, and this interconnectedness is also reflected in the storing of the data. Technically, the mabIT software tool is a so-called relational database with a web-based graphical user interface. The software has been designed to fulfil the needs of the present study. The interconnectedness of the data, for example, raises the

analyzability as it allows many different kinds of analysis and minimizes the database's hindering effect on the creativity at the analysis stage. The technical term 'normalization' addresses a fundamental part of database design that aims at reducing the redundancy by decomposing tables (Avison & Fitzgerald, 1995; Watson, 2003). The variables included are normalized to a certain degree, but further normalization of the database could have been made to increase the efficiency and decrease the amount of redundant data. To optimize the database in mabIT technically was, however, not the primary objective in the development of mabIT, and the normalization that has been made should be sufficient to increase the possibility to perform various analyses. The technical design of the database, with tables and relations that join the tables, is not shown in this thesis, but can be seen in the preceding licentiate thesis (Dahlin, 2005, Figure 4.4, p.71).

The fact that the user interface of the mabIT software is web-based also means that the underlying database, storing all the data, resides on a web server. The high accessibility is one of the primary reasons for selecting a web-solution but it is also one of its greatest threats. During spring 2007, four intrusions into mabIT were logged, and more attempts may have been made. These intrusions have caused some extra work as the entire database have been searched for changes by comparing it to previous, backup versions of it, and all illegitimate alterations are believed to have been restored. Accessibility is thus obtained in exchange for vulnerability.

5.7 Preparing for Analysis

The coding of the data has been made to enable analysis of mergers, acquisitions and bankruptcies and business network change, but the set of coded data stored in mabIT cannot directly be used for analysing the sequence of forces, following the analytical model from Chapter 4. The data can clearly be used for many different kinds of analyses; it can provide the basis for exciting case studies, following one or more companies through the years included in the study, just as well as for various quantitative analyses, where causalities are sought (cf. Neuendorf, 2002). This study is however guided by the analytical model and the steps taken in order to make the data analyzable will be described in this section. It contains two main parts: refining the data and compiling it for analysis and export.

5.7.1 Refining the Data

The intention of the study has never been to capture "all" the mergers, acquisitions and bankruptcies, "all" the actors and "all" the relations, as that is not believed to be doable within reasonable efforts. However, complementing some aspects of the data might be rewarding for the analysis of the events, actors and relations that indeed are captured through the analysis of the news items. This is referred to as 'refining the data', and includes both removal of unwanted data and completion of

wanted additional data. Although many news items have been used in the primary coding phase, additional sources may be used to refine the coded data.

Which specific aspects that are refined in this study will be described in the next chapter, but one example is that the product type of some actors may need to be looked further into through complementary information from additional data sources. There can also be some duplicate entries that are to be removed, despite the coding guides' matching against already registered actors and the other precautionary actions taken. Furthermore, some of the data might not be within the scope of this study's interest as given by the analytical model developed in previous chapters. For example, some events may be registered where the involved actors, at an occasion after the registration, have all been found to be of a different nationality than Swedish, which makes the event irrelevant to the study.

5.7.2 Compiling the Data for Analysis and Export

Different types of analysis require the data in mabIT to be presented in different ways. Some kinds of analysis can be conducted directly with the mabIT software. There are, for example, relatively simple descriptive tables of the different types of events, roles and relations that show the distribution among the categories. Likewise can the actor and event information pages, shown earlier, be of great assistance if the analysis aims at telling a specific actor's story. However, some analyses are better made with external applications that are specializing in different modes of analysis, so functions for exporting data from mabIT to such software have therefore been written. Currently, exports can be made to three external applications: Microsoft Excel for further arrangement, operations and reports, SPSS, for various kinds of statistical analyses, and Pajek, for enabling social network analysis and visualization.

The Social Network Analysis (SNA) software Pajek is used in this study, for example, to analyse the potential concentration of the forces to certain network positions. There are many different computer software packages to perform network analysis (Huisman & van Duijn, 2005) and most of them offer a large set of techniques, algorithms and measures, together with more or less powerful tools for visualizing networks (de Nooy, Mrvar & Batagelj, 2005). Some of the reasons for using Pajek in this study is that it is free to use, it is designed to handle large networks and it seems to be quite well maintained (Batagelj & Mrvar, 2003; 2007; de Nooy, Mrvar & Batagelj, 2005). Additionally, Pajek is being used in various types of research, for instance, industry as well as citation studies (e.g. Leydesdorff, 2007; Lüdemann et al., 2004; Porter, Bunker Whittington & Powell, 2005; Weimao, Borner & Viswanath, 2004). However, only a fraction of the many measures and functions available in Pajek will be used in this study.

Different applications require different data formats, so each export function must be designed separately. The data structure in Pajek resembles the ideas behind mabIT, which made it a quite manageable task to program an interface between mabIT and Pajek by creating a list of actors together with a list that defines lines

connecting actors in either a relation or an event. The lines, or 'edges' in this field (Harary, 1959; Wasserman & Faust, 1994), can be ascribed different types, labels and values, which are used to separate the different types of relations included in the study. The actors can also be ascribed properties, such as size and the number of involvements, but that feature will not be used in this study. What is exported to Pajek is thus a list of the actors linked through various relations and events. The export to SPSS is made via the supported script language of SPSS, through which variables can be defined and data entered. Exports to Microsoft Excel are simply done by using a tab-delimited file format.

The exported data contains both variables directly held by mabIT, as described in section 5.5, and variables calculated for specific purposes decided by the analysis. Obtaining this data thus requires some additional data processing and these variables are favourably calculated and quantified in mabIT before the export. Examples of such calculated variables are the number of involvements for each actor, and the binominal variable showing whether an actor is related to another actor, which in turn is involved in one or more events. This is an important step to enable analysis, but the needs for adapted variables depend on the analysis, and once the needed variables are defined, it is merely a programming issue to get the data into the external program.

5.8 Directed Analysis

Although the coding of the news items is the largest analysis effort, the outcome of the coding phase cannot necessarily be used for the directed analysis. The coded data set is not able to answer specific questions, but rather provides the foundation for conducting directed analysis and posing direct questions. So, although this is the step of the study where results are presented, the last step of analysis represents a small fraction of the time and effort behind the study. This directed analysis is however the goal of all the other stages, from the design of the coding scheme to the refinement of the coded data, and is naturally of great importance.

The objective of the directed analysis is set by the aim of the study (Chapter 1) and narrowed down by the presentation and specification of the analytical model (Chapters 2, 3 & 4). It is thus the research questions and analytical model that guides the analysis; they are what set the direction of the directed analysis. For this study, this means that the directed analysis will describe a business network change sequence within the studied Swedish IT-related business network using the dimensions and indicators suggested in earlier chapters. This will be done in line with the specifications of the suggested force-based approach made in Chapter 3 and 4, concluding in an analytical model, which guides all stages of the use of the data structuration technique.

Insofar as the dimensions and indicators of the characters of a business network change sequence were specified in the previous chapters, such analyses will be made. However, the directed analysis will largely be of an explorative nature, using

the different analysis tools mentioned earlier, and will be of qualitative as well as quantitative nature. The analysis will thus be of a varying kind, and whereas the qualitative analysis can offer clarifying exemplifications, quantification of the data enables numerical analysis that increases the comparability of the results. However, the data is not of a common quantitative nature. It is neither real numbers nor ordinal estimations obtained from respondents, but quantifications of the data obtained from the news items and processed with the coding scheme. It is thus a quantification of qualitative data; a fact which must be remembered throughout the analysis.

5.9 Accomplishments of mabIT

Looking back to the beginning of this thesis, the development of a method to study mergers, acquisitions and bankruptcies as business network change was important already in the ambition behind this thesis. This was intended to be made by continuing the development of a data structuration technique presented in the licentiate thesis preceding this work. A wide coverage of the past turbulence among Swedish IT-companies was wanted, and the suggested approach to business network change emphasized the changes rather than the continuing structure, so those were the preconditions for the method. What has been described in this chapter is, consequently, a method in line with these conditions. A data structuration technique, in its current application called mabIT, has been created and contains a data collection strategy, coding scheme and supporting software. After describing the idea behind mabIT, the input data and all different steps of data handling, this section summarizes its accomplishments in relation to the ambition and objective of the thesis.

News items are the primary data source and the information in the news items is coded to represent actors, relations and events. This is the very core of the data structuration technique: adding structure to a large amount of data. The coding phase involves discovery and interpretation of fragmentary evidence (Welch, 2000), i.e. pieces of information are brought together to form a description of the phenomenon in focus. The coding is done based on a number of variables to reflect the analytical model presented in earlier chapters. However, coding the data is a process of interpretation, and although the mabIT software contains guides supporting the coding, it is not an exact procedure. The coding is, therefore, made in rather rough categories, aiming at getting more 'concrete' information out of the news items rather than interpreting attitudes, values and truthfulness (cf. Hellgren et al., 2002; Wetherell, Taylor & Yates, 2001; Vujakovic, 1998). Of relevance for a discussion on the reliability of the interpretation and coding phases is the learning that takes place during the data processing procedure. With the increased experience gained from reading and coding news items is an increase in speed and a confidence in the variables of the coding. This may be a source for variations in the coding, and for that reason, the news items from one of the first years that was coded (2002) was looked through once again at the end of the data coding stage,

and although some variations were found, it is not believed to be a considerable problem for this study.

The integrity of the coded data is secured by using an organised database and programmable functions, which offer good opportunities for flexible analysis and does not let technical aspects be a hindrance for creative analysis. The coded data makes up pieces of information, combined to form an analyzable data set representing the studied case of mergers, acquisitions and bankruptcies involving Swedish IT-companies. The analytical model is then applied in a subsequent chapter describing the directed analysis. Each data source and method has its advantages and disadvantages, which affect the outcome and direction of the research. Therefore, this study is believed to enable a slightly different understanding of business networks as well as mergers, acquisitions and bankruptcies. The specification of the database, newspapers, years and search terms used enable a good understanding and reproducibility of the data collection. Likewise, the thorough presentation of the coding scheme should enable a good understanding for the quality and handling of the data.

Capturing all the mergers, acquisitions and bankruptcies involving Swedish IT-companies during this period has not been the objective of this study. Thus, the turbulence has not been captured, but a part of it has. This is an important statement, which, for example, has great consequences in assessments of the quality of the obtained data. Those events that are mentioned in the news items used are seen to represent the turbulence. They may differ from the 'normal' event, and perhaps they do since they are mentioned in a news item, but understanding that possible bias would require further inquiry into this potential difference. The events that are known to this study are consequently compiled to form a picture of the studied phenomenon. The temporal data of the events is worth commenting on, and as has been mentioned earlier. Dating mergers and acquisitions is hard, so the resulting dates ascribed to the events are debatable. Most of the events are simply dated based on the news item dates, i.e. representing the announcement of the event. Mergers and acquisitions are surrounded by much secrecy, and much information is not likely to be given prior to the public announcement. Thus, the point of time of the announcement is considered to define the start of possible reactions by other actors and effects in the business network and is, as such, a quite relevant basis for the dating of the event. By using this basis for dating in most of the events, the 'error' at least becomes rather uniform.

As was made clear already in section 2.4, the intention of this study is not to capture a business network and study how it changes, but to capture changes that occur within a business network. The business network structure, with all the actors and business relationships, is thus far from fully captured, inline with this intention. The resources of the study have instead been devoted to gaining a wide inclusion of events and their immediate contexts. A general limitation of the studied IT-related business network was defined with its origin in Swedish IT-companies together with the actors that are of importance to these companies.

However, a business network is an abstract concept describing a pattern of exchanges and dependencies, so it is not visible and understandable in a definite meaning, but is always a question of interpretation.

The coding of the data includes identifying actors and relations from the information in the news items, which is sometimes problematic. All actors and business relationships in the studied IT-related business network are not captured in this data, but some parts, centred on the events, are known. These are the actors and relations that have been considered relevant to mention in the news items, for whatever reason. One way to learn about a business network is to ask representatives of different companies to mention their five most important customers or suppliers, for instance, and the mentioning of some actors and relations in the news items is actually quite similar to this. The business network data is thus not considered complete, but at least to some extent relevant. With more attention turned to business networks as wider structures than as sets of business relationships, not many details are known about the registered relations. Instead, the relations are pretty much coded binary, as either existing or not existing (cf. Gadde & Mattsson, 1987; Wilkinson, Wiley & Lin, 2001), but a categorization of the relations is, however, made. An interesting aspect of the data capturing the business network aspect is that the actor and relation data can be obtained from different perspectives. For example, a representative for the well known company “A” would perhaps not mention their relatively small customer, company “B”, in an interview for a newspaper article, but a representative for company B could very well proudly describe itself as having company A as a supplier. This adds an interesting dimension to the business network data, enabling more nuances. Some news items can however be hard to make sense of, and one such example is shown below, where a complicated set of relations is described.

Computer Sweden 2002-09-23

FMV köper säkra skärmar av MultiQ

Försvarets Materialverk, FMV, har beställt 300 platta bildskärmar från tillverkaren MultiQ. Ordern togs av MultiQs distributör Dator Design, men levereras av Fiberdata som har avropsavtal med FMV. Bildskärmarna har upphandlats av PCQT, som utvecklar och marknadsför datorer med tillbehör till industrin och försvarssektorn. Det är också PCQTs uppgift att komplettera bildskärmarna så att de blir 100 procent avlyssningssäkra.

----- English translation -----

Computer Sweden 2002-09-23

FMV buys secure monitors from MultiQ

The Swedish Defence Materiel Administration, FMV, has ordered 300 flat monitors from the manufacturer MultiQ. The order was received by MultiQ's distributor Dator Design, but is delivered by Fiberdata who has a suborder agreement with FMV. The monitors have been procured by PCQT, who develops and promotes computers and accessories to the industry and defence sector. It is also PCQT's task to complement the monitors to make them 100% bugging proof.

Just as for the events, the relations can be hard to arrange in time, i.e. establishing the start and end of them. The starting of cooperation projects, or the placing of a large order, is quite often announced in a news item, but the ending of a relation is seldom published (Vonortas & Safioleas, 1997). This may be a weak part of the current data set, but just how serious it is will be an issue for subsequent analysis. It is however important to be aware of both the structural and temporal inconsistency of the data. It does not have complete data on mergers, acquisitions and bankruptcies, actors or relations, and neither on the timing of them. However, the information that is included is believed to be useful to find indications of the turbulence among Swedish IT-companies, and should enable them to be studied as a business network change sequence. All the captured pieces of information together form a case on mergers, acquisitions and bankruptcies as forces underlying business network change through the 10 year long business network change sequence that is captured.

6 Analysis of the Structured Data

The analytical model as well as the data collection and handling have been described so far, and now follows the analysis of the data, which will be made in two main steps. In this chapter, a descriptive analysis of the structured data will be made and the specific efforts made to refine the data are presented. Then, the next chapter will present an analysis of part of the data as a business network change sequence, as stipulated by the suggested force-based approach and the analytical model, which in the next step is applied to part of the data.

This first step of analysis has two main goals: to give an overview of the data and to describe the refinement procedure. By dividing this first analysis into three parts, describing 1) the data set after the coding phase, 2) the refinements made and 3) the data set after the refinements, an evaluation of the used data structuration technique can be made. This is an important aspect since developing a way to empirically study business network change was part of the aim of the entire thesis, and evaluation of the suggested approach and the method used is thus natural. For this reason, the quality of the data will also be investigated by reflecting over the coverage and iterative assembly of the data.

6.1 Data Set after the Coding Phase

As was described in the last chapter, computerized searches in three newspapers, limited to the years 1994-2003, resulted in 3625 news items, which were then assessed manually and the relevant information was coded according to a coding scheme, also described in the previous chapter. During the coding phase, new events, actors and relations were registered as they were found in the input news items, and existing events, actors and relations were modified when complementary data was found. The following description concerns the state of the data after the coding phase was finished, but before the refining of the data had commenced. More precisely, this data set is from December 29, 2006 when the last news items had been coded, which is just over three years after the development of mabIT was started.

Table 6.1 below shows a compiled overview of the data set after the main coding phase. It does not distinguish different types of event, actors and relations at this stage, but simply adds up the total number of registered entities to 1402 events, 3211 actors and 3383 relations. Before looking further into these numbers, it is relevant to determine the need for completion of the data. As was described earlier, this is referred to as refining the data in preparations for a subsequent analysis, so

which aspects that are considered worth spending resources on to complement is thus decided by the intended analysis.

	Events		Actors		Relations	
Total number	1402		3211		3383	
Incomplete entities (percent of total)	<i>Missing event type</i>	0,6%	<i>Missing product type</i>	31,2%	<i>Missing relation type</i>	0,7%
	<i>Missing time</i>	10,6%	<i>Missing nationality</i>	30,5%	<i>Missing time</i>	24,1%

Table 6.1 Overview of the data after the coding phase

6.1.1 Missing Event Data

Looking at the 1402 events, it can be noted that the unclassified events are few, and only makes up 0.6% of the included events. It is thus not a big issue, but the eight unclassified events will be subject to complementing data refinement. However, a substantial part, accounting for not less than 10.6% of the events, are missing a specification of the year of the time and need to be complemented. Following the identified needs for completion of the event data, the two shortcomings have been addressed and duplicate entries have also been removed. By searching for more information about the events that were not categorized according to their type, one has been deleted whereas the others were categorized after a further look into them. A more extensive task was to complement the time information of the 149 events of which the time was unclear after the original data-coding phase. This has likewise been done by looking for more information about the events, and by doing so a large share of the incomplete events could be completed. However, the aim of dating the events on a level of months has been abandoned and a precision of years is now used. The complementing information was found through the company archive and news archive of Affärsdata¹¹ as well as web searches through Google¹², finding both company web pages and news texts.

6.1.2 Missing Actor Data

The actors, 3211 in total, showed some major gaps concerning both product type, where 31.2%, or 1003 actors, were missing information about the product type, and almost as many, 980 actors making up 30.5% did not have their nationality specified. The missing data on product type and nationality is to a large extent overlapping, as 843 actors have neither of the variables specified. Since the intended analysis of business network change uses product types to assess the

¹¹ www.affarsdata.se

¹² www.google.com

contextual extension of the business network change sequence, it is quite important to have data about the product type for as many of the actors as possible, and the nationality is important in the decision of which events involve Swedish IT-companies.

The data refining process concerning the actors has thus been quite extensive. As a first step, the data set was manually searched for duplicates. This way, 63 actors were removed, or actually consolidated as there were two of each registered. A function in the mabIT software was added to make it easy to consolidate two registered actors and still retain the relations and involvements in events of both actors. Then, the product type and nationality was approached. Categorizing the actors in these variables is not as easy as it may seem. Firstly, due to the focus of the data collection, many of the actors disappeared many years ago, and did not leave much information on the internet as many companies do today. Secondly, IT-companies quite often have trans-lingual names, so, for example, the nationality of a company called “Cybernetics” is not obvious. An order of priority was set up for the refining work; the most prioritised actors were those who are involved in one or more of the events and the second most prioritized were those actors that are related to any of the involved actors. These were the primary focus of the data completion efforts, and completion of product type and nationality data has not been made on all actors that neither are involved in an event nor related to an involved actor. Just as for the event data, additional data about the actors was found using both company and news item archives and web search engines.

6.1.3 Missing Relation Data

Concerning the relations, 25 of the 3383 were missing a specification of its type, which is a fairly low number. The timing of the relations is more alarming. As the table shows, about 24%, or 816 relations, were missing information about either the start or end date. Looking further into those relations where information has been registered reveals a large problem. Dating the relations was a hard task since news items announcing the start or end of relations between companies were not specifically searched for, and this information thus is secondary to the reporting on mergers, acquisitions and bankruptcies. The registered time information concerning the relations is therefore often quite vague, which is quite logical since the ending of a relation probably is not something the companies are likely to announce in the press. So, if adding the relations with somewhat unclear time information to those missing such information a total of 3248, or 96%, were incomplete regarding the time.

Due to this large amount of incomplete data, and the experienced difficulties in finding time information, specifying the start and end time of the relations would, if possible, be very resource consuming, so no completion of the data on relations have been made in this study. This naturally affects the quality of the data, making it inconsistent with regards to time, and that is an issue affecting the upcoming directed analysis. However, some incomplete relations were deleted, and some

relation data was also affected as actors were deleted and consolidated due to the refinement of the actor data.

6.2 Data Set after the Refinement Phase

After the completion of the data, through additional searches for information, a refined data set has been obtained. This is the data that will be used for the directed analysis of business network change, and this section will describe some aspects of it, guided by the variables presented in chapter 5.5. This should not be confused with the analysis of business network change, using the suggested force-based approach, which is found in the next chapter, but instead, it is an overview of the structured data of which some will be used in the subsequent directed analysis.

6.2.1 Event Data

Starting with the events, the data-coding scheme uses a number of variables to describe them, including text describing the event, its source and some data on the registration of the event. More central, the category and date of the event, but also a specification of the actors involved in the event was included in the coding. Eleven categories of events were used in the coding phase, and the number of events in each of these categories is shown in Table 6.2 below. Adding up the categories gives a **total of 1401 events** that are included in the data after the refinement phase. Of these, acquisitions are the dominant type, accounting for 55.2% of the events, with another 8.3% to be found in the group of partial acquisitions. Then follows bankruptcies, with 9.4%, whereas deliberate closures of companies makes up 1.5% of the events. Mergers are almost as common as bankruptcies, with 8.9%, but substantially less common than acquisitions. The categories of transformations, potential events and failed consolidations, i.e. representing events that are not pure mergers, acquisitions and bankruptcies, together represents a considerable 16.7% of the registered events.

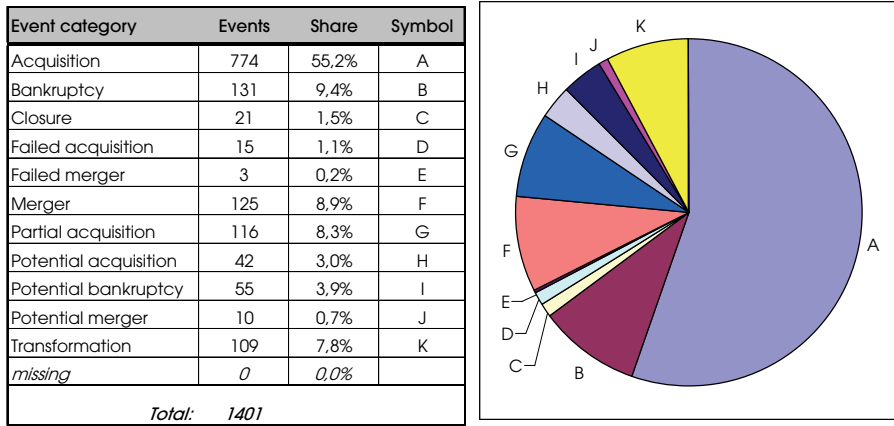


Table 6.2 Distribution of the events in the different categories

Besides distinguishing different types of events, the dating of them is an important variable in the coding scheme used. The distribution of the events over time is therefore interesting to look into. Table 6.3 and the accompanying graph shows the distribution of the 1401 events over time. The years focused in this study, 1994-2003 are dedicated one slot each, but 24 events have also occurred before the studied period and five have been found to take place after 2003. Worth noting, is the increase up until 2001, and the sharp decrease in 2003, which will be further discussed later.

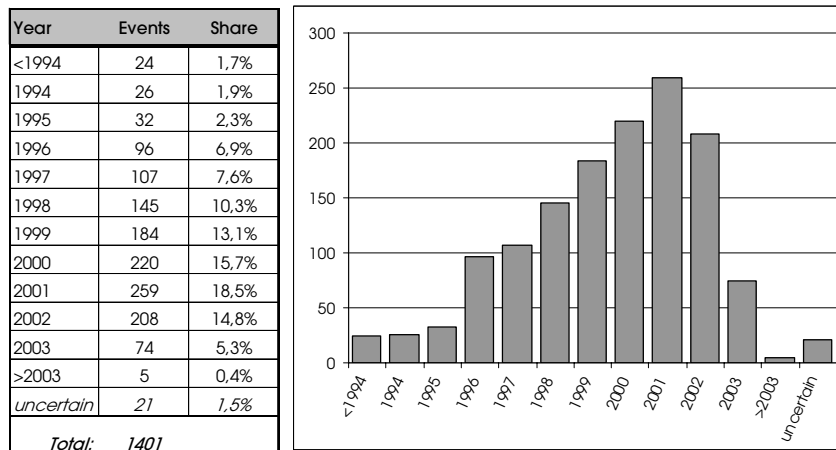


Table 6.3 Distribution of the events over time

Concerning the involvements of actors in the events, the typical event involved two actors, which, if considering the type of events focused, is not surprising. The two-actor events account for 62.5% of the 1401 events, and the one-actor events, which also are understandable considering the interest in bankruptcies, makes up 14.8%. A slightly larger portion, 18.3%, involves three actors, which often is a seller, buyer and target, or two merging actors and the established new identity. Beyond this, 3.4% involves four actors, which leaves only 1% with more than four actors. The event with the maximum number of actors, involving not less than 16 actors, was when the company Ericsson merged 15 of its subsidiaries to a new company in 2002. It is thus somewhat of an internal reorganization, but still likely to have affected other actors related to any of the involved actors.

6.2.2 Actor Data

Turning to the actors, where the data refinement was most extensive, the total number have been reduced to **3150**, as some entries were found to be duplicates. Of the variables included in the coding scheme concerning actors, the names and general descriptions are not relevant to analyse beyond the use of them in the removal of duplicates, and the data describing the registration of the actors will be returned to later. Variables describing the establishment and closing date of the actors were included, but they have barely been used and are therefore not analysed. Of more importance is, however, the product type of the actors, shown in Table 6.4. Note that the 1003 actors with unspecified product type now have been reduced to only 64 through extensive data completion work. As is clear, the IT-related actors dominate, together making up 69% of the actors, but the 29% non-IT actors clearly makes it wider than purely an IT-industry study. Of the IT-related product types, the IT service group is clearly the largest, alone accounting for 44%. A few examples of what each product type contains can be mentioned. IT services are mainly consultants, software and support firms. IT goods are computer hardware components, monitors and printers. IT various are both conglomerates and actors, which are known to be within the IT-sector, but where the details are not known. Lastly are the various kinds of non-IT actors, of which financial and telecom makes up a large part.

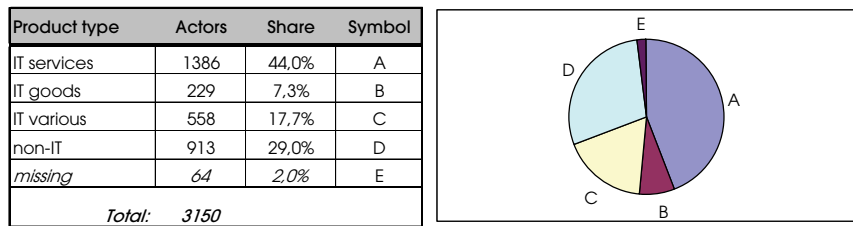


Table 6.4 Distribution of the actors in the used product types

Concerning the nationalities of the actors, the included actors are not as heterogeneous as when regarding the product type. Table 6.5 below shows the nationalities of the actors, separating the Swedish from the non-Swedish actors, and dividing the non-Swedish actors into continents. The actors whose nationality is unknown have been reduced from 980 to 74 through the refining efforts, and now make up a minor part of the data. Swedish actors are clearly dominant, which is not surprising given the focus of the study. Of the foreign actors, two continents can be distinguished, Europe and North America, and there is also a substantial post, making up 3.2%, of actors of which the specific nationality is not known, but it has been clear that they are not Swedish. Looking further into these numbers, the United States is, second to Sweden, the most represented nation with 7.6% (240 actors), followed by the countries geographically closest to Sweden: Norway (114 actors), Denmark (80 actors) and Finland (68 actors).

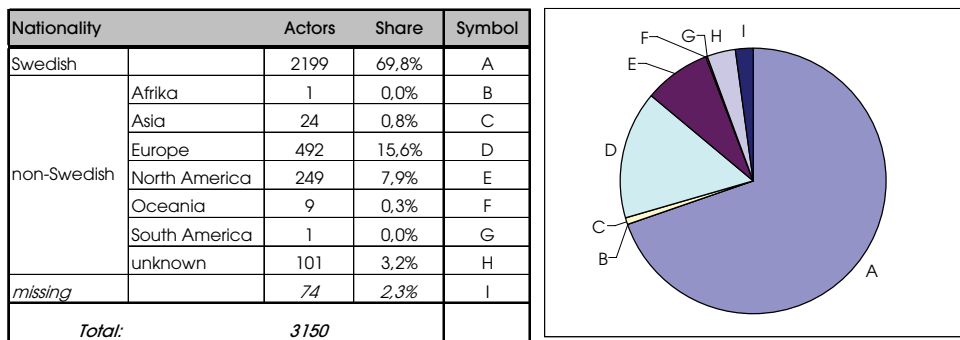


Table 6.5 Geographical distribution of the actors

There was also a possibility to register characteristics of the actors, such as size, and although this aspect was not included in the specification of the analytical model of business network change used in this study, the data concerning characteristics of the actors will be briefly described. In all, 2512 entries describing characteristics have been registered. Of these, 39.0% concerns employees, 6.8% is related to locations such as the number of offices or representation in countries, and 1.8 is about customers or market shares. Turning to the financial numbers, 33.3% of the characteristics describes turnover whereas 18.8% instead reveals profits. In addition, a small number of other characteristics were registered. Looking at the distribution of the characteristics, only 23.7% of the actors are described with one or more characteristics. 47 actors have more than 10 characteristics registered, with the top notation at 52 entries for WM-data. The data on characteristics of the actors is thus very unevenly distributed.

6.2.3 Relation Data

Besides events and actors, a set of variables on relations was included in the coding scheme. Of the variables listed earlier, the general description was used to support the coding of the relations, and is not analyzed further. Different types of relations were distinguished, and the **total amount of 3408 relations** were distributed over the types as shown in Table 6.6 below, and the observant reader notices that this is an increase in comparison to the state before the data refinement phase. Of the registered entities, ownership relations are the most frequent, with 40.3% of the total number of relations, followed by customer-supplier relations, accounting for 31.5%. Also of significance are partnership relations and retailer or distributor relations, which thus have been separated from the customer-supplier relations. Minor shares are associations, mostly to industry organizations, and some other, vaguely specified relations.

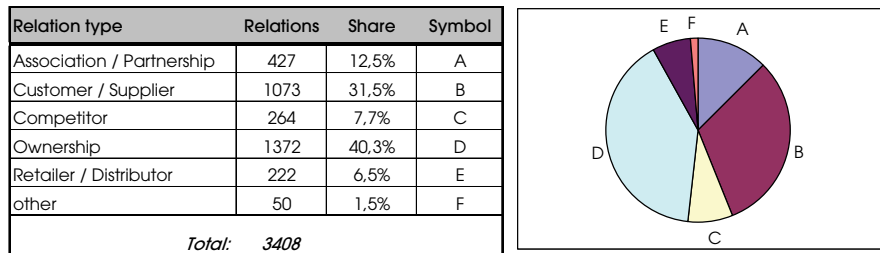


Table 6.6 Distribution of the relations in different types

Looking at which actors take part in these relations, a first reminder is that each relation was defined as a dyadic entity, which means that each relation involves two actors. This means that on average, there are

$$\frac{2n_{relations}}{n_{actors}} = \frac{2 * 3408}{3150} = 2.2 \text{ relations/actor, but the distribution is far from uniform.}$$

For a quite large share of the actors, at least some relation is known, but still, 25.7% of the actors are not part of a registered relation. For 40.8% of the actors, one relation is known and then the frequency quickly decreases as the number of relations per actor increases. The actors being part of five or more, and ten or more, of the relations have been consolidated into two groups that together account for a respectable 9.9%, with the Swedish telecom company Telia as the actor with the highest number of registered relations: not less than 113.

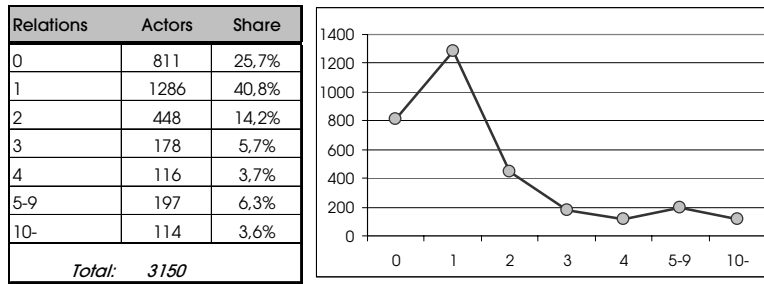


Table 6.7 The number of relations per actor

Relations vary over time, and some are developed whereas others are ended. The data on relations therefore included variables describing the time of the relation's start and end. As described earlier, these variables have been hard to make good use of, and often either the start or end time is not clearly specified, often as ">1998", indicating that the relation had at least not ended in 1998. The temporal aspect of the relations will thus be hard to make good use of.

6.3 On the Data

Even though this data is not intended to capture all the mergers, acquisitions and bankruptcies involving Swedish IT-companies during the studied period, it is interesting to see how the obtained data compares to other descriptions of the studied situation, but also is it interesting to consider the quality of the coded data achieved through the iterative data collection. Continuing this chapter's focus on a general description of the coded and refined data, this section gives some insights into the representativeness and quality of the data set, which gives an opportunity to reflect on the method used.

6.3.1 The Representativeness

The description of the turbulent situation among Swedish IT-companies that was given in the introductory chapter used numbers from government records to describe the number of IT-companies along with the number of bankruptcies of such companies. According to that data, the top notation of IT-companies in Sweden during the studied period between 1994-2003 were 27 372 in 2003, with an average of 18 130. This could be compared to the 1545 actors included in mabIT that are coded as Swedish and IT-related. One reason for this huge difference is that the focus of this study's data collection has been on mergers, acquisitions and bankruptcies, and the obtained data is thus not likely to capture all IT-companies, but more likely such IT-companies that are involved in mergers, acquisitions and bankruptcies during the studied period.

If instead looking at the events, the government records, from Statistics Sweden, report a total of 2248 bankruptcies over the years 1994-2003, which is substantially more than the 125 bankruptcies registered in mabIT during the same period. It is reasonable that the newspapers used do not write about all the bankruptcies and they, firstly, might not be aware of all bankruptcies, and secondly, are only likely to dedicate space to bankruptcies of companies of assumed significance or interest to their readers. So, even if all bankruptcies are not captured with the method used, some of the bankruptcies that can be of interest to the public are indeed captured, perhaps because the bankrupt company is an established business. As government records do not hold data on mergers and acquisitions, a comparison of such events cannot be made, so any possible difference in the coverage between mergers, acquisitions and bankruptcies cannot be established here.

Anyhow, despite the limited portion of the bankruptcies that are captured, the representativeness over time is rather good. Figure 6.1 below shows the distribution of events over the years 1994-2003. The figure contains three categories, and shows one line for the bankruptcies reported in the government records as provided by Statistics Sweden (SCB), one line for the bankruptcies registered in mabIT, and one line for all the events in mabIT. The y-axis shows how large share of the bankruptcies from the respective category that occur for each of the years. From the figure, some similarities between the line showing mabIT events and SCB bankruptcies can be suspected, whereas greater similarities can be recognized between the variation of the bankruptcies in the SCB data and the bankruptcies in the mabIT data, with a dip in 1998-1999 and a peak in 2001-2002. This suspected similarity is supported by a Pearson correlation coefficient of 0.772, with a significance of 0.009.

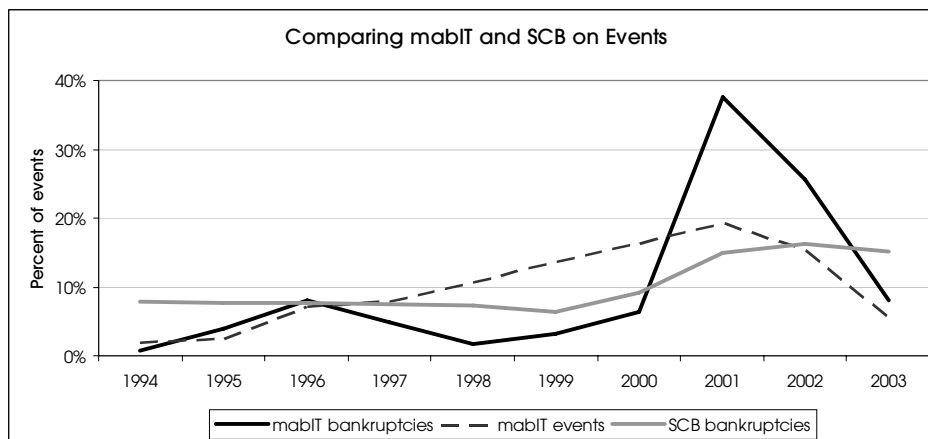


Figure 6.1 Bankruptcies in government records compared to events in mabIT
Data from mabIT and Statistics Sweden (SCB)

The sharp decrease in the number of bankruptcies, as well as events in general, in the mabIT numbers concerning the year 2003 is interesting to notice. Part of the explanation for this is probably that some of the events are found reported in news items some time after the actual event, such as, for example, "...company X, that last year acquired company Y...". Part of the relatively low number of events in 2003 could thus be explained with the fact that news items from 2004 were not included in the data collection. Another interesting thing to notice is the horizontal shift that appears between the mabIT bankruptcy line and the SCB bankruptcy line. The data in mabIT seems to be about one year ahead if looking at the dip in 1998 vs. 1999 and the peak in 2001 vs. 2002. This could be explained by the fact that what is reported in the newspapers often is the filing for bankruptcy, whereas the government records shows when the bankruptcy has gained legal force, and it is likely that some time passes between these two stages of a bankruptcy.

6.3.2 The Iterated Data Collection

Leaving the discussion of what data has not been captured, the substance of the data that is registered in mabIT is worth looking further into. For the events, the text where the event is described was registered along with each event, and besides the original text, there is a possibility to add more descriptions if more information is found about the event in other sources. This possibility has been used for 346, or 24.7% of the events, together keeping 720 additional descriptions, but this does however not include the sources used in the data refinement phase when the date and type of some events were looked into further. Although the use of several descriptions is not necessary, events that are described by more than one source can be considered more substantiated.

As the last chapter described, the used data structuration technique is not linear, but iterative. This became concrete in the described refinement phase, as was specified in the first part of this chapter, where events and actors were complemented with additional information through directed search efforts. As data concerning the creation and modifications of events and actors is registered, the iteration in the form of post-creation updates can be followed up. Every modification is seen as a refinement of the data, and these kinds of modifications are, for example an adjustment of the date of an event or the product type of an actor, and have been made as new information is found about the event or actor. 415 of the events, or 29.6%, have been modified after the original registration of the event, the addition of extra descriptions excluded. This is a moderate number, especially when seen in comparison to the actors, where the most extensive data complementing effort was made. Of the 3150 actors, 3106, i.e. 98.6%, have been modified, which is certainly a sign of very high degree of iterative refinement. Unfortunately, only information about the last modification is stored, so no analysis of the number of modifications can be made. The relations have been modified even less than the events, but no information about the modifications of relations have been stored, so a similar analysis as of the events and actors cannot be made.

However, the possibilities for post-creation modifications of the data have in general been used regularly, which should strengthen the quality of the data.

6.4 Concluding the General Analysis

After conducting the extensive work of analysing the 3625 news items and coding the contents in accordance with the data structuration technique and analytical model, described in earlier chapters, this chapter has described the result: a coded and refined data set. The purpose of this chapter has been to give an understanding of the data and what has been captured, and has therefore made use of the entire data set. In the next chapter, an analysis of business network change will be made, following the model and specifications presented in Chapters 2-4. That analysis will extract different subsets of data in various steps of analysis, and thus only make use of parts of the data set.

7 Analysis of the Business Network Change Sequence

This second chapter of analysis will apply the force-based approach to the obtained data on mergers, acquisitions and bankruptcies involving Swedish IT-companies during the years 1994-2003. The approach was suggested in Chapter 2, specified in Chapter 3 and 4, and modelled in Figure 4.7, and this chapter will bring together all earlier parts of this thesis in an exploratory application of the approach. Not only will this provide a description of the character of a business network change sequence in the studied Swedish IT-related business network, but it is also an explorative test of the suggested way to approach business network change as well as the data structuration technique used, and much can be learnt from this application.

Whereas the last chapter contained a general analysis of the obtained data, this directed analysis will only make use of parts of the data, since some of it does not match the study's focus on mergers, acquisitions and bankruptcies involving Swedish IT-companies during the years 1994-2003. So in this stage of the analysis, the data set in mabIT is subject to various filtering and calculations in order to provide a description of the studied business network change sequence. In this stage of data processing, the construction of mabIT, with a high degree of interrelatedness of the coded data, is of great help.

7.1 Intensity of the Business Network Change Sequence

Starting with one of the two main dimensions used to describe the character of business network change sequences, the intensity of the studied change sequence in the Swedish IT-related business network will first be approached. The assessment of the intensity will be made using the three indicators specified earlier, and this analysis will start with the amount indicator, which will make the identification of relevant events clear. It is important to note that the focus of this analysis will be on the character of the business network change sequence made up of all the studied mergers, acquisitions and bankruptcies that involves a Swedish IT-company, whereas specific examples from the data are secondary to this analysis.

7.1.1 Amount

Following the statements from Chapter 3, mergers, acquisitions and bankruptcies are seen as events and, as the stabilizing mechanisms are disregarded in this study, these events get to represent forces and can thus be the basis of the analysis of the

business network change sequence. This does however not mean that all 1401 events that are included in mabIT are analyzed as forces. The focus of the study is mergers, acquisitions and bankruptcies involving Swedish IT-companies during the years 1994-2003. This emphasizes three conditions for including an event in the study of change of the Swedish IT-related business network:

- 1) the event must be a kind of merger, acquisition or bankruptcy
- 2) the event must take place in 1994 at the earliest and 2003 at the latest
- 3) the event must involve at least one Swedish IT-company

As is evident from the general description of the data, given in the previous chapter, the obtained data set is wider than the conditions set for the specific business network change sequence analysis, despite the actions taken in the data collection to restrict it in line with these requirements. The data set thus includes events that are not wanted in the analysis of the specific change sequence, and Table 7.1 shows the systematic reduction following the above three conditions.

Right Type	Right Time	Involves a Swedish IT-company	Events	
No	No	No	2	0.1%
		Yes	3	0.2%
	Yes	No	48	3.4%
		Yes	181	12.9%
Yes	No	No	1	0.1%
		Yes	27	1.9%
	Yes	No	178	12.7%
		Yes	961	68.6%
<i>Sum:</i>			1401	

Table 7.1 Reduction of events irrelevant to this study

Starting from the left, following condition 1, each event is evaluated based on its type. Not all of the types of events that were listed in Table 6.2 are considered relevant for this study. The events categorized as transformations and potential or failed consolidations are excluded from this analysis as they are not believed to affect the business network in a similar way to mergers, acquisitions and bankruptcies. These types of events are thus not considered to be of the right type, unlike acquisitions, bankruptcies, closures, mergers and partial acquisitions. The first, and largest, elimination of events is thus made in the leftmost column, based on the type of the event. Secondly, the times of the event are evaluated in a similar way, and events occurring before 1994 or after 2003, or missing a proper year specification, are excluded from further analysis. Whether the events involve a Swedish IT-company is the third criteria for inclusion, and after the completion of the data, for instance regarding the nationality of the actors, some events failed to meet this requirement. The events that are included in the business network change

sequence analysis must fulfil all three conditions, which form a path marked in dark grey in the table above.

Altogether, 961 events remain after this condition-guided reduction of the included events, and are thus the events that this analysis will be based on. A closer look into the reduction in Table 7.1 shows two main reasons for excluding events registered in mabIT. One is the type of event, which immediately makes 234 events irrelevant for further inclusion, and the other is the lack of involvement of a Swedish IT-company, which makes 229 events irrelevant, however with some overlap of the event type. The time, on the other hand, is not an obstacle of the same magnitude as only 33 events fail to meet those requirements. Although some events violate several of the conditions for inclusion, only two of the 440 reduced events fail to meet any of the conditions, whereas 386, or 88% of the reduced events, fail to meet only one of the set conditions. This shows a quite good level of relevance of the events registered from the news items, but still, 440 events, i.e. 31.4% of all registered events, have been included in the data set without use to this analysis.

This systematic reduction is very important in its identification of the events that are of relevance to the study of a business network change sequence in the Swedish IT-related business network. The events get to represent forces, and the potential multitude and variability of forces from events is thereby disregarded in line with the uncomplicated definition of the amount indicator of the intensity of business network change. The amount of change in this study is thus 961, but this number does not give much information in isolation and must be seen in relation to something else. However, due to the absence of other studies, made with a similar method but focussing on other situations, comparisons of this amount is unfortunately not possible. So at this stage, the idea that the IT-sector went through large changes, as described in the introductory chapter based on mass media reports and government records, can be taken as an indication that the Swedish IT-related business network did experience a quite large amount of change, and 961 events of this kind is thus a considerable amount. On average, two mergers, acquisitions or bankruptcies have occurred each week among the Swedish IT-companies, and such a frequency should most likely have created a great dynamic. However, whether this amount is high or low still remains unanswered because of the lack of comparability, so describing the amount as high is thus an arbitrary conclusion, but finding a relative measure is hard as the possible maximum value is an infinite number of forces. To add nuances to this aspect, a further introduction of time as a variable is made through the temporal concentration indicator presented next.

7.1.2 Temporal Concentration

The temporal concentration of the forces is another factor by which the intensity of business network change should be assessed. A matrix with four types of temporal concentration was described earlier, and of these, a high temporal concentration is a situation where a large part of the included forces take place

during a small part of the studied period of time whereas a low temporal concentration implies an even spread of the forces over the studied period, with small variations from year to year. This section first contains qualitative analysis based on that matrix, and then suggests a numerical analysis.

From the last section, analyzing the amount indicator by letting the events represent forces, the total number of forces included in the study is known to be 961. But that amount covers the entire period, i.e. 10 years, and studying a long period of time is naturally different from studying a short period, so for this reason, the total amount of forces should be described based on the distribution over the included time periods. The section on the amount of forces mentioned an average of two events per week during the studied period, but a more detailed analysis of the distribution of the forces over time is required to get an understanding of the temporal concentration. A uniform average is not very true to more varying distributions, so in this study, each of the 10 years will be considered an individual time period, and as a tentative mode of analysis, the distribution of the forces will simply be expressed through the number of events per year. These values are shown in the second column in Table 7.2 below, and the accompanying graph displays the distribution, with the values connected to each other to form a frequency line.

The graph shows quite a resemblance to Figure 5.3 (p.132), which illustrated the number of filtered news items per year. This resemblance is supported by a Pearson correlation of 0.949, significant at $p < 0.01$, between the number of events/year and the total number of filtered news items/year, which shows the strong connection between the input data and the coded data. If looking into what is behind the years, some examples can be given from one of the low frequency years, 1994, and the year with the highest frequency, 2001. The number of events was relatively low in 1994, with only 23 events, and not more than 40 different actors were involved in these events. Of those that were involved in events that year, some were more active than others: Celsius made four acquisitions, Källdata was also very active with three acquisitions and the IT-conglomerate WM-data bought two other companies. This shows that a small number of actors were behind a rather large share of the activity. In contrast, 2001 reports almost eight times more events, but the number of involved actors is almost ten times the number for 1994, namely 388 unique actors. In 2001, WM-data and its subsidiaries were involved in eight events of various kinds, and Källdata, by now transformed into TurnIT, was involved in not less than nine acquisitions, more precisely in the role of selling out a subsidiary. Two of the more extreme examples are the IT-consultancy company Framfab, who bought, sold and merged not less than 16 times during 2001, and the government owned telecom company Telia, involved in not less than 16 events as they made an extensive sell-out of subsidiaries during this year.

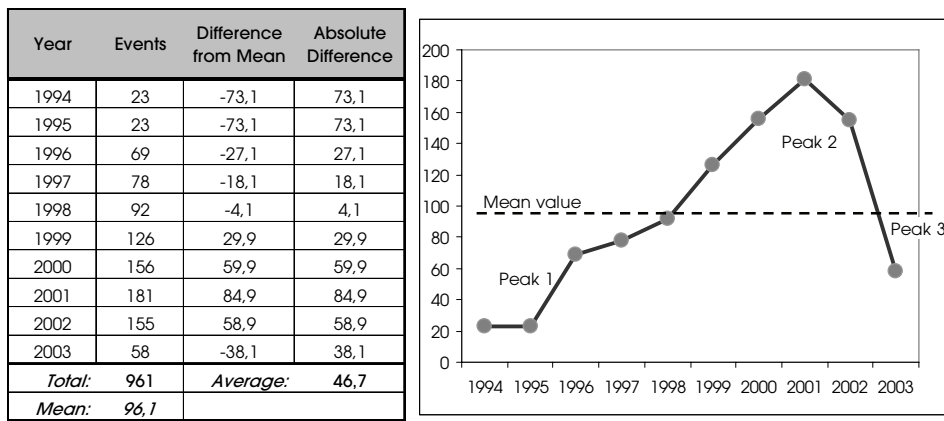


Table 7.2 The distribution of the forces over time

The graph shows a quite uneven distribution, with a sharp peak around 1999-2002. The average of about two events per week is thus not very representative for the actual distribution, as 1994 and 1995 have less than one event every other week, and the top notation is eight times as frequent, with 3.5 events per week. A qualitative interpretation of the temporal concentration can be guided by the different situations shown in Figure 4.3. Judging from the distribution graph, the variation is quite high, and the number of peaks is quite few. A peak has been defined as a consecutive set of time periods being either above or below the mean frequency value. In the bottom of Table 7.2, the mean frequency is calculated to 96.1 events/year, and this value is shown in the graph as a dotted line. The intersections between the mean value line and the frequency line now acts as a divisor of the peaks. Three peaks can be identified, and are marked in the figure. Peak 1 extends from 1994 to 1998 and thus contains five consecutive years of a number of events per year lower than the mean value. Peak 2 starts with 1999 and ends with 2002 and is thereby a four year long period of above mean amounts of events. Peak 3 is started just as the study ends, i.e. in 2003, and the length of it in this study is one year, although it very well can continue over years beyond the scope of this study.

The maximum possible number of peaks in this study is 10, i.e. one for each time period, and the minimum number of peaks is 2, given the definition of peaks. In relation to this possible range, the 3 peaks found in this study's data is certainly a low number, indicating a high temporal concentration. However, a low number of peaks should be combined with a short length of the peaks above the mean frequency line, and the four years in peak 2 thereby reduces the temporal concentration. Turning to the variation in frequency, the difference between the low numbers in 1994-1995 and the high numbers in 2000-2002 seems very large, but the remaining years are rather uniformly distributed around the mean value line. The variation is however considered quite large, and taken together; a rather

high temporal concentration is believed to characterize the change of the studied Swedish IT-related business network. This means that the temporal concentration of the studied events has greatest resemblance to the upper-right type in Figure 4.3, illustrating the highest temporal concentration. In situations with this level of high temporal concentration, the variations between the studied years are large, but the fluctuations are few and the years with relatively many events are concentrated to a relatively few years.

The analysis has so far followed the earlier description of the temporal concentration indicator, but another way to describe it is to assess the temporal concentration numerically, which could enable comparisons between different situations. A measure of the temporal concentration will thus be suggested, based on an assessment of the distribution of the events over time. Following the reasoning earlier, this approach should include the number of peaks, the length of the peaks and the variation between the frequencies. A number of formulas will be presented next, suggesting one way to model temporal concentration, and thereby being able to calculate a relative and comparable value of it.

Starting with the variation; this will be assessed as the fluctuation around the mean frequency, which according to the table above is 96.1. Each time period's difference from the mean value is calculated, shown in the third column of Table 7.2, and made absolute by disregarding the sign, shown in the fourth column. The bottom of the table shows the average value of the absolute differences, 46.7, called 'average absolute difference' (*AAD*) to distinguish it from the 'mean' number of forces per year. It shows how much the average deviation from the mean value is, so a low value indicates evenness and thus a low temporal concentration. This resembles the simplest form of statistical variance measure, and although improved definitions of such measures have been suggested in order to avoid bias, this kind of simple measure will be sufficient for the tentative analysis attempted in this study. The average absolute difference is, in itself, not very informative, but by relating it to the mean frequency, a quotient describing the average absolute difference in relation to the mean value is obtained, and a measure that is useful to make comparisons is thereby created. Consequently the 'variation quotient' (*V*) is here defined as $V = \frac{AAD}{mean}$, which in this study gives us $V = \frac{46.7}{96.1} \approx 0.49$, meaning that the average difference is 49% of the mean number of forces per year.

Variations of almost half the mean value might seem a lot, but to get an understanding of its value, the maximum possible quotient could be considered. The higher the number of time periods that contribute to the total amount of forces, the lower the variation quotient, so in the extreme case giving the maximum variation quotient, only one time period will contribute to the number of forces, and all others will be 0. Letting *T* denote the number of time periods and *S* the total number of events, i.e. the sum, this gives V_{max} :

$$V_{\max} = \frac{\left(\left(S - \frac{S}{T} \right) + \frac{S(T-1)}{T} \right)}{T} \bigg/ \frac{S}{T} = 2 \left(\frac{T-1}{T} \right)$$

The maximum variation quotient is thus only dependent on the number of time periods included, which for this study makes $V_{\max} = 2 \left(\frac{10-1}{10} \right) = 1.8$. In a situation with the highest temporal concentration and ten time periods, the average difference can thus be 180% of the mean value, and in relation to this, the result of 49% in this study is less impressive. As the number of possible time periods varies between 2 and ∞ , V_{\max} varies from 1 up towards 2.

The variation quotient takes the fluctuations around the mean value into account as well as reflecting the number of time periods that contribute to the total number, and will thus reflect the peaks. In that respect, this value represents the concentration of the events in the time periods, but it does not really handle the number and length of the peaks. Therefore, the variation quotient will be used to construct another measure.

This second stage of the numerical analysis will make further use of the assumption that the variation should be as great as possible. This is done by compiling a simplified graph, shown in Figure 7.1, from the real distribution of the forces by ascribing all time periods with a frequency below mean a value of $mean - V$ and all time periods with a frequency above mean a value of $mean + V$. This distorts the graph, especially when the number of time periods below the mean and the number of time periods above the mean differs greatly, but produces a simple graph that can easily be described using numbers.

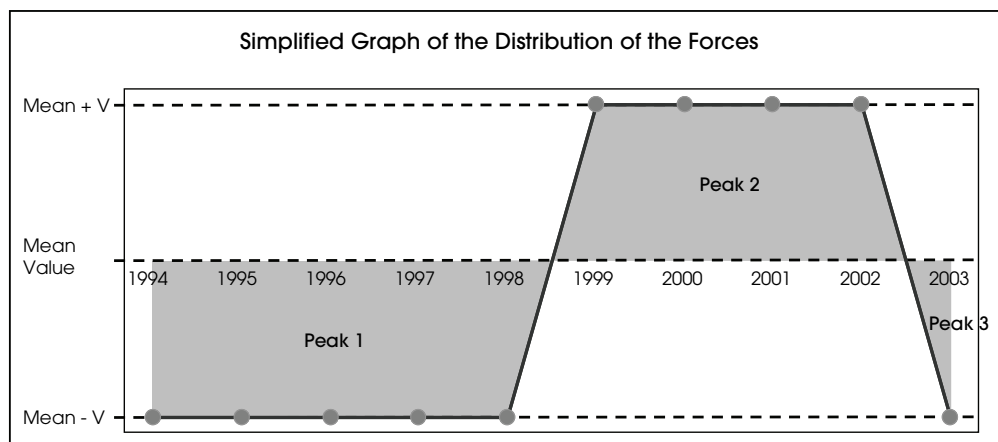


Figure 7.1 Simplified graph of the distribution of forces over time

The ‘area’ of the peaks, marked in grey in the figure, will be used as a representative of the sum of the variation. Despite the use of the word ‘area’, it should be noted that this is a highly analytical construct and not the actual integral of the graph. It does not represent anything other than a simplified property of the graph, but it serves this tentative analysis’ need for a numerical assessment of the aggregate variation. The distance between two time periods is set to 1, and to emphasize what is known during the studied period, the development before the first and after the last time period is omitted from the calculation, leaving the total length $T-1$. The variation quotient (V) is naturally the distance from the mean value. From this, the area can be calculated using ordinary geometry, but one more aspect must be included: the alterations between peaks. These alterations are here called ‘intersections’ (I) as the frequency line intersects the mean value line, and each such intersection affects the area and must therefore be included in the formula. So, the divisors between peaks, i.e. intersections, are used instead of the number of peaks. Looking further into the signed difference from the mean value for each year, shown in the third column of Table 7.2, an alteration between a negative and positive value implies that the line representing the mean value has been intersected. Two such intersections can be found: between 1998-1999 and 2002-2003. Each intersection reduces the area, representing the sum of the variation, which is the representation wanted. Concluding these definitions, this so called area (A) is calculated as follows:

$$A = V \left((T-1) - \frac{I}{2} \right)$$

However, also this measure is believed to be of more use if made relative to the maximum value, and furthermore, to make the formula more appreciative of lower values, the temporal concentration (TC) is defined as the square root of the ratio between A of the current study and the theoretically maximum value for A . This A_{\max} is obtained at V_{\max} , which occurs at $I=1$, hence:

$$TC = \sqrt{\frac{A}{A_{\max}}} = \sqrt{\frac{V \left((T-1) - \frac{I}{2} \right)}{V_{\max} \left((T-1) - \frac{1}{2} \right)}} = \sqrt{\frac{V \left((T-1) - \frac{I}{2} \right)}{\left(2 \left(\frac{T-1}{T} \right) \right) \left((T-1) - \frac{1}{2} \right)}} = \sqrt{\frac{V \left(T-1 - \frac{I}{2} \right)}{2T + \frac{3}{T} - 5}}$$

Which in this study is:

$$TC = \sqrt{\frac{0.49 \left(10 - 1 - \frac{2}{2} \right)}{2 * 10 + \frac{3}{10} - 5}} = \sqrt{\frac{3.92}{15.3}} \approx 50\%$$

Temporal
Concentration

50%

The qualitative assessment made earlier placed the studied business network change sequence in the highest temporal concentration quadrant. The numerical analysis seems to give a lower estimation, but still recognizes some characteristics of

temporal concentration. On this scale, ranging from almost 0% and up to 100%, the change of the Swedish IT-related business network is thus considered to be just over the middle part of the scale (the precise value is just over 50%), primarily reduced by the variation which turned out to be relatively low using this measurement model. However, it must be noted that this measure should be interpreted with great caution, and not taken as a definite measure but rather an example of how the character of a business network change sequence also can be assessed numerically. It has been used here to get a numerical estimation of the temporal concentration and will be of use when comparing different distributions. It is actually not until several of these measures have been compared that the obtained 50% can be considered either high or low, which completely depends on the studied phenomenon. For example, perhaps the variations of the number of apples growing on an apple tree can be very large from one season to another, whereas a year to year variation of just a few percent of the average temperature of the world's oceans would have enormous effects. The scale is thus highly dependent on the phenomenon, and reflects the possible underlying mechanisms. This could thus be interesting for learning more about the nature of business networks.

7.1.3 Radicality

When the radicality indicator of the intensity of business network change was described in section 4.2.3, mergers, acquisitions and bankruptcies were placed on a scale ranging from yielding only adjustive forces on one hand, and only radical forces on the other, and all three events were considered to cause a relatively large share of radical forces. As the analysis of the amount earlier in this chapter described, two additional types of events are now included in the study, and must therefore likewise be placed on the radicality scale. One is closures, which are believed to give rise to a lower share of radical forces than bankruptcies because of the deliberate nature of closures in comparison to bankruptcies. The other is partial acquisitions, which are believed to cause a substantially lower ratio of radical forces than both full acquisitions and mergers since partial acquisitions are believed to primarily be a change of ownership. It should however be noted that these are only assumptions, and further attention to the topic will not be possible in this study.

An example of a partial acquisition is when one of the most prominent Swedish investment companies, the Wallenberg-owned Investor, through its subsidiary Investor Growth Capital in 2000 bought 28% of the shares in Optocomm, a company dealing with fibre-based network solutions. The minority ownership taken by Investor makes it reasonable to believe that the business of Optocomm in general will continue as before the deal, perhaps taking advantage of the new owner's stability, reputation and contacts. This kind of partial acquisition is therefore assumed to give rise to a relatively large proportion of adjustive forces, but still implies a respectable potential for more radical forces due to the magnitude of this kind of deal. An example of a closure is when the well-known IT-company

Microsoft in 2002 closed down a subsidiary in Stockholm, called Sendit, which was a company working with leading-edge technology in mobile internet solutions. It was founded in 1994, bought by Microsoft in 1999 and had about 80 employees at the time of the closure. The venture had, according to the press, cost Microsoft several billions of Swedish kronor, and the reason for the closure was claimed to be that the technology was no longer needed. Such a closure is naturally likely to affect the actors to which it was related, but as the closure was deliberate and planned, rather than the result of financial trouble, there is a chance that Sendit and its relations were wound up in a controlled way and this kind of event is thus assumed to give rise to a lower proportion of radical forces than bankruptcies, although still causing a predominantly radical set of forces.

The types of events are thus described based on their expected content of radical forces, and based on this characteristic of the events, the overall radicality of the business network change can be assessed. It is however important to see the difference between the radicality of events and of the aggregated business network change. Following this assumed order among the types of events, the distribution of the events included in this study is, in Figure 7.2, shown over the radicality scale presented earlier.

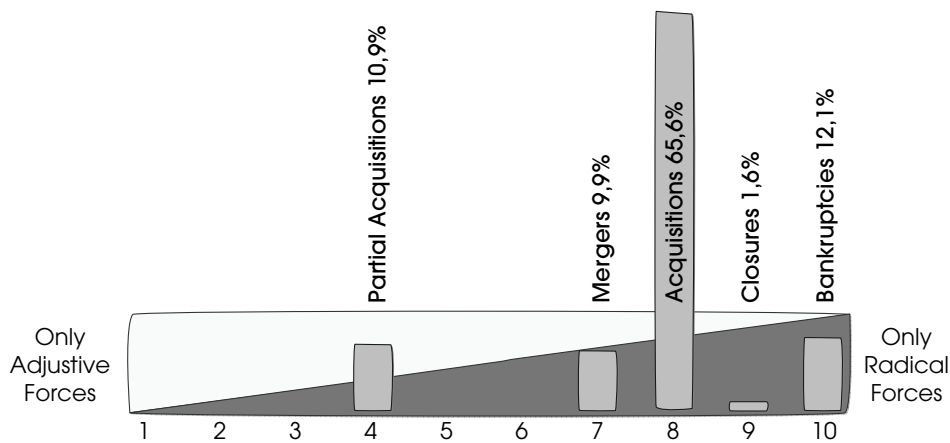
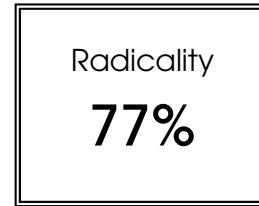


Figure 7.2 Distribution of the events in a radicality scale

As is quite clear, acquisitions are dominant, but when assessing the radicality of the business network change, this description of the distribution of the individual events must be aggregated to describe the change sequence and the distribution among the event types should thus be assessed in aggregate. A qualitative estimation of the radicality could be guided by the dominance of the acquisitions, and the combined radicality of the business network change sequence is therefore considered slightly lower than the position of the acquisitions, affected by the larger

share of mergers and partial acquisitions than of closures and bankruptcies. This means that the studied business network change sequence is believed to be characterized by a large proportion of radical forces.

However, the radicality can also be assessed numerically. In the figure above, numbers ranging from 1 to 10 have been included below the scale. These can be used as weights of the types of event, thereby getting an overall value. Each partial acquisition is in this weighting ascribed a value of four, each merger a value of seven etc. The average of the products of the events and their weights gives a value of the average weight, 7.7 in this case, as shown in Table 7.3. Relative to the used scale, this means an overall radicality of 77%.



Type of event	Events	Weight	Weighted sum
Partial acquisition	105	4	420
Merger	95	7	665
Acquisition	630	8	5040
Closure	15	9	135
Bankruptcy	116	10	1160
<i>Total:</i>	961		
<i>Average weight:</i>	7,7		

Table 7.3 Weighted distribution of the types of events

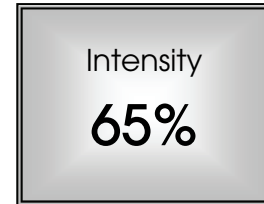
7.1.4 Intensity of the Business Network Change Sequence

The three indicators together making up the intensity dimension of the character of the studied business network change sequence have now been assessed in different ways. They describe different aspects of the intensity, each giving one side of it, and a more nuanced description of the intensity of the studied business network change sequence can be obtained by combining the three indicators.

The analyses of the indicators have described the business network change sequence of mergers, acquisitions and bankruptcies in the Swedish IT-related business network during 1994-2003 as having a high amount, moderate temporal concentration and high radicality. In other words, the studied situation is believed to contain relatively many forces, based on the occurrence of the studied events. The number of events has been found to vary over the years and there is a quite large difference between the highest and lowest frequency. However, using the suggested definition and model of that indicator, the concentration of the events in time could have been much higher, which lowers the value of the temporal concentration. The radicality, based on the assumed proportion of radical-adjustive forces from the various events, was found to be quite high. The studied events are dominated by acquisitions and the radicality of the studied business network

change sequence is therefore to a considerable extent governed by the properties ascribed to acquisitions.

Numerical assessments were made for two of the indicators: the temporal concentration and the radicality. Such analyses were made to explore the possibilities to describe intensity and its three indicators through relative measures, thereby formalizing the assessments and enabling comparisons between different situations. In earlier chapters, the indicators were described and depicted as a three-dimensional Euclidean space, having the amount as the Y-axis, the radicality on the X-axis and the temporal concentration on the Z-axis. As numerical analysis only was made for two of the indicators, the amount will simply be disregarded when the vector representing the combined intensity is calculated with the Euclidean metric: $\sqrt{0.5^2 + 0.77^2} \approx 0.92$. In relation to the maximum value, using indicator-scales up to 1, this value represents about 65%, which is the value that gets to represent the intensity. With this value, the intensity of the change of the Swedish IT-related business network must be considered quite high.



7.1.5 A more Nuanced View of the Intensity Indicators

Although a description, and even a measure, of the intensity of the studied business network change sequence has been obtained, there are some additional ways to use the data and indicators to give a slightly more nuanced view of the intensity. This mainly concerns dividing the set of data into different groups, and analyzing the different indicators in respect to the different groups. Of the three indicators analyzed so far, this has already been done for two of them: the temporal concentration uses the years as a divisor of the number of forces, and the radicality uses different event types to differentiate between the forces. What remains to be done is to make a cross analysis of the years and event types, thereby analysing the temporal concentration for different kinds of events and the radicality for the different years. The data underlying such analysis is presented in Table 7.4.

							b) ↓		
Year	Partial acquisition	Merger	Acquisition	Closure	Bankruptcy	Radicality per Year			
						Amount	Weighted sum	Radicality	
1994	5	1	16	0	1	23	165	72%	
1995	2	2	14	0	5	23	184	80%	
1996	5	5	52	0	7	69	541	78%	
1997	4	11	58	0	5	78	607	78%	
1998	17	13	58	2	2	92	661	72%	
1999	17	20	84	1	4	126	929	74%	
2000	20	19	108	1	8	156	1166	75%	
2001	18	13	101	5	44	181	1456	80%	
2002	17	8	94	6	30	155	1230	79%	
2003	0	3	45	0	10	58	481	83%	
a) → Temporal concentration per event type	Amount	105	95	630	15	116	961		
	Mean	10,5	9,5	63	1,5	11,6			
	AAD	7,3	5,7	27,0	1,7	10,2			
	V	0,70	0,60	0,43	1,13	0,88			
	I	2	2	2	4	2			
	A	5,56	4,80	3,43	7,93	7,01			
	TC	60%	56%	47%	72%	68%			

Table 7.4 Cross-indicator analysis of temporal concentration and radicality

To begin with, the temporal concentration can be assessed for the different types of events simply by separating the events based on their type and then applying the numerical analysis of temporal concentration for each of the event types. The calculation of the temporal concentration, and the values needed for that calculation, is presented below each event type in the table, in the section marked **a)**. From this calculation, each event type can be described in two aspects: the amount marked by italic letters, which is identical to the numbers used in the analysis of radicality, and the temporal concentration (TC) marked in black, which shows numbers not previously presented. From these numbers it can be noted that the acquisitions are distinguished through the largest amount combined with the lowest temporal concentration. There is a fairly large variation in the temporal concentration of the five event categories, and the two most radical, i.e. bankruptcies and closures, appear to also be the most concentrated in terms of time. The temporal concentration calculated earlier for the entire business network change sequence is heavily influenced by the acquisitions due to their large share of the numbers of events. The division into the five event categories reveals a larger temporal concentration in some types of events, which shows a more nuanced picture of the business network change sequence than indicated by the total temporal concentration value of 50% and reveals a variation in the dynamics.

Likewise can each year be described in terms of the amount and radicality, found in the rightmost section of Table 7.4, marked **b)**. This section contains the numbers

underlying the calculation of the radicality for each year; both in the form of the number of events per year, identical to the information that was used in the overall temporal concentration analysis earlier, and weighted sums calculated based on the weighting procedure used earlier. The differences in the radicality are not as great as those found in the temporal concentration, but they are still quite interesting. Figure 7.3 below shows the years plotted in radicality and amount per year, which makes it possible to follow the path of time through these dimensions. The figure shows a variation of more and less radical years, and the general increase in the amount over the years is quite clear. It is interesting to notice that 2003, a year that also earlier has been identified as trend breaking low, is the year with the highest radicality.

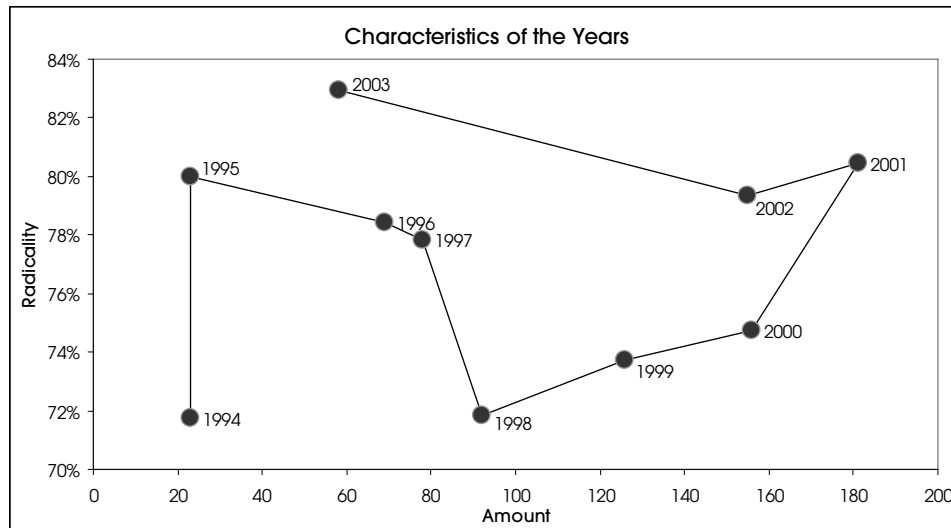


Figure 7.3 Radicality and amount over time
 Note that the radicality scale is an excerpt of the 0-100% scale

Through this cross-indicator analysis, where each event type can be described in terms of amount and temporal concentration, and each year in terms of amount and radicality, a more nuanced understanding of the intensity of the studied business network change can be obtained and differences between the categories as well as the years can be distinguished. This interesting type of analysis is possible from the efforts made to construct measures of temporal concentration and radicality and it illustrates the use of these suggested measures very well; they are not intended as perfect measurements of the intensity of business network change sequences, but rather as assessments that enables comparative analysis to be made.

7.2 Contextual Extension of the Business Network Change Sequence

Moving on to the second dimension used to describe the character of a business network change sequence, the intensity-analysis' focus on the events is exchanged for a focus on the contexts of the events. By analyzing where the forces occur, analysed through actors and relations in conjunction to the events, the extension of the change sequence can be described. This section will use actor-centred analysis as well as analysis of event-centred network elements, and both direct involvements in the events and involvements through relations will be included.

7.2.1 Actor Extension

The first indicator through which the contextual extension of the studied business network change sequence will be described is based on the actors, and the analysis is consequently actor-centred. Put simply, this indicator shows whether the occurring forces are either concentrated to a few actors or spread over many, thereby affecting a larger part of the business network. Also in this analysis, the forces will be addressed through the events, and it is thus the occurrence of events, assumed to give rise to forces, that is studied. Since this study has no intention of capturing a whole business network, it is not relevant to analyze the distribution of the events over all the actors in the business network, but rather the distribution of the events over the actors that are known, i.e. the actors that in some way are involved in one or more event.

As has been described earlier, mergers, acquisitions and bankruptcies are, in this study, seen as not only affecting those actors that are **directly involved** in the event, e.g. acquiring or merging, but also the actors that are related to those directly involved, and thereby **involved through a relation**. This is addressed through event-centred network elements; subsets of the studied business network that are centred on an event. The temporal aspect of the relations will be disregarded due to the incompleteness of the time data concerning the relations, and this has the effect that actors in the following analysis may be associated to events through relations that were not active at the time of the event. However, in situations where the relation has ended before the event, it is possible that some kind of 'remains' exist between the two formerly related actors (cf. Havila & Wilkinson, 2002), which reduces the seriousness of the issue. Nevertheless, the temporal inconsistency caused by this use of the data will have to be accepted in order to enable the analysis.

There are two conditions, of which an actor must meet at least one, in order to be included in this step of the analysis: it must be directly involved in at least one event *or* be related to at least one actor that is directly involved in an event, i.e. involved through a relation. The events referred to here are the 961 events that earlier were considered relevant for this study (see section 7.1.1), and the result of this analysis and reduction of actors is shown in Table 7.5.

Directly involved	Involved through Relation		Actors	
	No	Yes		
No	No		744	23,6%
	Yes		1011	32,1%
Yes	No		731	23,2%
	Yes		664	21,1%
			3150	

Table 7.5 Reduction of the actors based on involvements in the events

As the compilation shows, 23.6% of the actors are not included in this particular part of the analysis as they are neither directly involved in one of the included events nor related to any of those who are directly involved. There are thus 2406 actors left that are involved in one or more events, directly or through relations, and the distribution of the 961 known and relevant events over these actors will be the basis for the actor extension analysis. In the suggested scale, a high extension means that the events are spread over many actors which, if expressed differently, means that each actor is involved in a few events. In contrast, the actor extension is reduced if the events are concentrated to a few actors, which thus means that each actor is involved in several events.

Although this study has its focus set on describing the character of the studied business network change sequence, some examples of individual actors and their roles in the changes will first be given, starting with actors distinguished as being very frequently involved in events. To identify a concentration of events to certain actors, the number of direct involvements and the number of relations to directly involved actors has been counted for each actor, and a compilation of the top 10 most involved actors are listed in the left part of Table 7.6. The list is headed by the Swedish telecom company Telia, the Swedish-Finnish IT-company Tietoenator and the Swedish telecom company Ericsson. The rest of the companies are to a greater extent IT-companies, but the representation of two telecom companies in the front of the top 10 list is interesting to notice and can be taken as a sign of the close interaction between the telecom-sector and the IT-sector in the product and technology development. Although the size of the actors has not been explicitly analyzed, the companies found in this top 10 list are among the largest of the companies included in the data, many with a turnover of several billion SEK. It should however be noted that the high number of involvements of these companies primarily is made up of involvements through relations, namely to 66%. They are thus not primarily the most active companies in directly making events happen, but are rather related to many other companies, and are that way affected by many events. As section 6.2.3 mentioned, Telia is the actor that is part of the highest number of relations registered in the used data set, which confirms this suspicion. Due to the design of the data collection procedure, relations are primarily captured in association to a merger, acquisition or bankruptcy, which thus implies a natural link between the total number of registered relations and the

number of relations to involved actors. So, an important part of the explanation for why these companies are the top 10 involved actors is that these rather large companies are related to many other companies, and that they, being well known companies, are often mentioned in news items.

Top 10 Involved				Top 10 Acquirers				
Involvements:	All	Direct	Related to	Involvements: as Acquirer	All	Direct	Related to	
Telia	76	8	68	Tietoerator	33	74	40	34
Tietoerator	74	40	34	WM-data	23	57	26	31
Ericsson	68	5	63	Sigma	23	38	25	13
IBM	58	6	52	Martinsson	16	36	19	17
WM-data	57	26	31	Bure Equity	14	31	14	17
Sigma	38	25	13	Drax Holding	10	17	11	6
Martinsson	36	19	17	Know IT	9	17	11	6
Frontec	34	17	17	Icon Medialab	7	29	10	19
Bure Equity	31	14	17	Merkantildata	7	27	10	17
TurnIT	30	12	18	Mandator	7	15	8	7
<i>Total:</i>	<i>502</i>	<i>172</i>	<i>330</i>	<i>Total:</i>	<i>149</i>	<i>341</i>	<i>174</i>	<i>167</i>

Table 7.6 Top 10 involved and acquiring actors

The right part of Table 7.6 shows the top 10 acquirers, and returning to the metaphor used earlier, these frequent acquirers are the ‘sharks’ in the business aquarium (cf. Arbel & Woods, 1988; Roberts, 1999). Some of the names are recognized from the top 10 total involvements, but some are new. IT-consultants are quite dominant on this list, but two investment companies are also present: Bure Equity and Drax Holding. In comparison to Weston and Weaver’s (2001) list of big companies’ acquiring records, for example, with General Electrics being involved in 617 acquisitions during 1981-1997 and Intel being involved in about 75-100 deals per year, the spectacular aura of the Swedish top 10 acquirers does tend to be reduced, but as stated earlier, this data does not cover all mergers, acquisitions and bankruptcies.

It is interesting to notice that also the ‘sharks’ are vulnerable, and some of these seemingly strong companies have faced other challenges after the studied time period. For example, Drax Holding went bankrupt in 2006, and a stock market value of three billion SEK had then been lost since the top notation. Another interesting story is that of WM-data, the second most frequent acquirer during 1994-2003 according to this study. In August 2006, the British company Logica CMG offered 11.9 billion SEK for WM-data, and the takeover was completed during the autumn of 2006. The buyer was in this case an even bigger shark; the British IT-company Logica had, over a couple of years, made a number of large acquisitions, including the Dutch IT-company CMG in 2002. A similar destiny

faced Martinsson, the fourth most frequent acquirer according to this study, which was acquired by Atea in 2005.

If all actors were as frequently involved as these, the events would be highly concentrated and the actor extension would thus be low. However, there are also quite a number of actors that have been involved in very few events, which contributes to the extension of the business network change sequence. Looking at the distribution of the studied events over the actors that in some way are involved, the lowest possible number of involvements per actor is 1. Such actors have thus only been involved in one event during the studied period, for example the company Prototum, a supplier of customer information systems, which in 2002 was bought by Tietoenator from the previous owner ABB Energy Information Systems. That is the only time Prototum has been mentioned in the used news items and it is thereby the only known involvement.

If all studied actors were only involved in one event, like Prototum, the actor extension would be maximal. An attempt to represent the actor extension through a numerical measure will be made in order to formalize the assessment and enable future comparisons, but as for the previous analyses, this measure should be seen as a suggestion of how this indicator can be assessed rather than as a definite measure. In this case, to get a comparable measure, the actor extension will be assessed based on the share of the involved actors that are directly involved in a maximum of one event and/or involved through a relation to a maximum of one event. Table 7.7 below shows the 2406 actors that somehow are involved in one or more events in a matrix describing the number of involvements directly (horizontal) and through relations (vertically), and those actors that are considered sparsely involved are shown in a bold font whereas the actors more frequently involved in events are shown in an italic font.

		Involvement through Relation		
		0	1	2+
Direct Involvements in Events	0		291	<i>720</i>
	1	663	121	<i>326</i>
	2+	68	18	<i>199</i>

Table 7.7 The number of direct and related involvements of the actors
Sparsely involved actors are shown in a larger, bold, font.

In all, there are 1075 actors that only have one direct involvement and/or one related involvement. These are thus involved in a low number of events, and if all actors were like these, the spread of the change would be maximal and the actor

extension would thus be the highest. In this case, the sparsely involved actors make up 45% of all involved actors, and this is the number that will get to represent the actor extension.

Actor
Extension
45%

This measure, i.e. the number of sparsely involved actors divided by the total number of somehow involved actors, can also be used to look further into the spread of the events over the actors. Starting with the direct involvements, Table 7.8 shows the number of actors with one or more involvements divided on different roles and the percentage of the actors that are sparsely involved through that role, i.e. in only one event. In comparison to the earlier specified value for the overall actor extension, the figures in the table shows that the actor extension is substantially higher when only looking at direct involvements. The numbers in the table should be interpreted as of the 1395 unique actors that are directly involved in one or more events, 80% are only directly involved in one event. So, the numbers show that the target, merging and bankrupt roles are dominantly one-time roles, which is not very strange given the nature of these events. The relatively repeated role is that of the acquirer, although still showing quite a spread over the actors, as only 28% of the acquiring actors have acquired more than once. Some of these repeating acquirers are similar to the examples of the top 10 acquirers given earlier.

	All roles	Acquirer	Target	Merging	Bankrupt	Other
Involved actors	1395	376	620	222	120	314
Sparsely involved	80%	72%	96%	96%	97%	91%

Table 7.8 Actor extension for different roles in direct involvements

The same analysis as above can also be applied to the actors' involvements through relations. Table 7.9 shows the analysis of the involvements through relations, and should be interpreted in the same way as the direct involvement table. So, 1675 actors are involved in one or more events through a relation to any of the directly involved actors, and 26% of these are only related to one event, i.e. a substantially lower share than for the direct involvements. The table shows a specification in four types of relations, and of these, competitor relations are distinguished as the least extended, whereas partnership relations have the highest degree of extension, assessed through the proportion of sparsely involved actors.

	All relations	Buyer-Seller	Competitor	Ownership	Partnership
Involved actors	1675	692	160	954	275
Sparsely involved	26%	26%	18%	29%	37%

Table 7.9 Actor extension for different types of related involvements

Seen together, it can be noted that direct involvements are generally much more spread than the involvements through relations, which is not very surprising but rather shows a reasonableness of the data set. An actor can be involved in many relations with many different actors, and are thereby exposed to potential involvements through relations to a larger degree than what is reasonable to believe for direct involvements. The measure used here to assess the overall actor extension does, however, not take the difference between direct involvements and involvements through relations into account, but it could surely be interesting to look further into. The actor extension has been approached through the spread of the events over the actors. So, the larger the proportion of sparsely involved actors is, i.e. actors only involved directly in one event and/or involved through a relation in one event, the more are the events spread over different actors which means a higher actor extension. With this definition, the actor extension of the studied business network change sequence was found to be mediocre. Although a considerable number of actors have been involved in very few events, the brief actor-focused expose showed that some actors have been involved in many events, so some local concentrations of change can indeed be found and that is what has reduced the actor extension.

7.2.2 Structural Extension

The structural extension is intended to reflect how widely spread the forces are in the business network structure, which in this study is assessed based on the structural positions of the actors in the immediate context of the mergers, acquisitions and bankruptcies, i.e. analyzed through event-centred network elements. If the entire studied business network could be captured, structural positions of the actors involved in events could be calculated, and a high structural extension would then be reached when the events were spread over the varying positions, i.e. the forces were acting on both central and peripheral parts of the business network. However, as this study does not capture the entire Swedish IT-related business network, and has no intention of doing so, another basis for this measure is used.

The assessment will instead be based on the conception that the structural extension is higher if the forces are spread over a larger part of the studied business network, following the underlying idea of the entire contextual extension dimension. For the structural extension indicator, the event-centred network elements are studied, involving the directly involved actors as well as those involved through relations. To achieve a high structural extension, these network elements, i.e. the different parts affected by the forces, should be inter-connected to a relatively low degree. A high extension, i.e. wide spread, thereby means that the event-centred network elements are more dispersed in the network structure than connected to each other. At the opposite end of the scale, a low structural extension is found when all the network elements are highly interlinked to form a coherent and dense structure of event-centred network elements. In order to

analyze the coherence of the actors involved in the events, the 961 event-centred network elements have been exported to the social network analysis software Pajek. This includes 2406 somehow involved actors, 2641 relations of the directly involved actors and involvements in the 961 events. What is obtained is a structure formed by the linkages between the event-centred network elements, and the result is shown in Figure 7.4 below. The inter-connectedness of the data set is of great importance for the study's business network focus, and will be further analysed later.

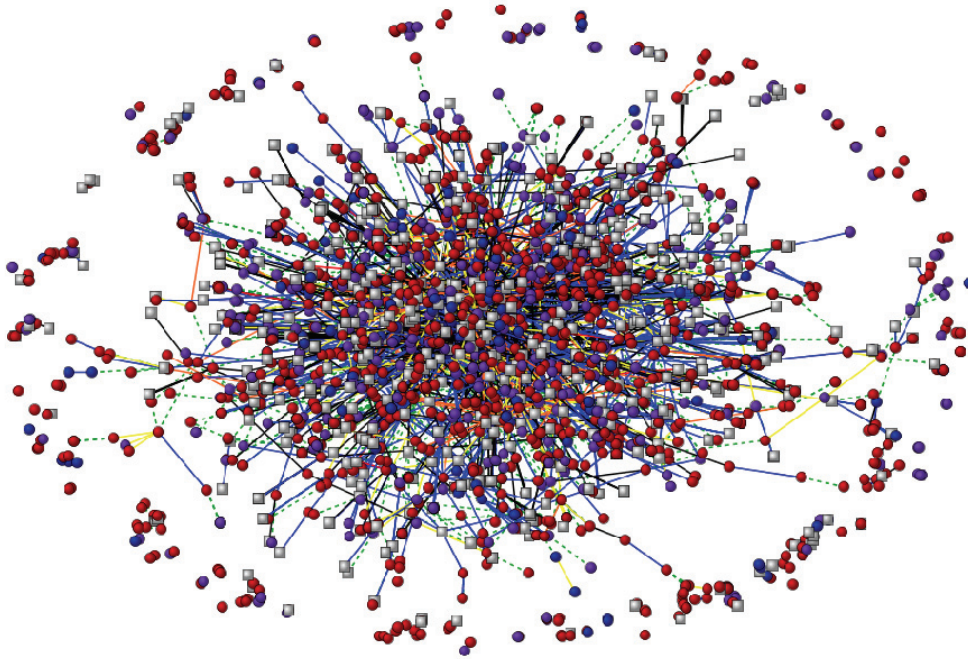


Figure 7.4 Structure of the involved actors

The colours and shapes of the actors represent different product types. Dotted lines represent direct involvements and solid lines represent involvements through relations. The colours of the lines represent different types of relations.

This picture shows the actors as different shapes and colours based on the product types (which will not be analyzed here), relations as solid lines and direct co-involvements in events as dotted lines. The structure has been energized using the Fruchterman Reingold algorithm in order to clearly separate the 'core' from the outliers in the layout (de Nooy, Mrvar & Batagelj, 2005; Fruchterman & Reingold, 1991). All the actors in the more central parts of the picture thus form a coherent structure, made up of the event-centred network elements, and this core component of inter-connected network elements contains 2067 actors. A seemingly high 86% of the 2406 involved actors are thus joined through direct involvements

and relations. However, what is a high or low value of the share of actors included in a coherent component varies greatly with the size of the Swedish IT-related business network, and more precisely the data set's coverage of the actors, which in this study is not known.

Furthermore, the bare size of the main component does not reveal the composition of it. If the component is densely interconnected, it is likely to extend over a smaller part of the entire business network than if it is 'straggly' and thus extends in many various directions to cover a larger part of the business network. The structural extension will therefore be assessed based on the straggleness of the structure(s) shown in Figure 7.4. What will be looked for are the actors that protrude from the others, as these are believed to contribute to a wider spread of the changing network elements over the studied business network. In the illustrative Figure 7.5, these actors are shown as white circles, whereas the black circles represent actors that do not contribute as much to the spread of the events over the business network structure as they are the link between many event-centred network elements.

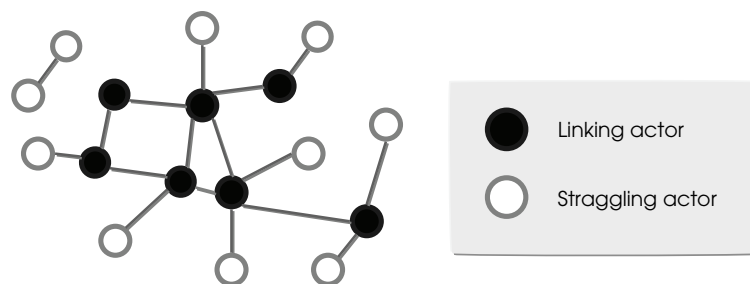


Figure 7.5 Linking and straggling actors

The linking actors, illustrated as black circles, are primarily actors that are involved in several event-centred network elements. Returning to the examples mentioned earlier, the frequently involved actors, such as Telia and Tietoerator, have a highly linking role as they connect a large number of event-centred network elements. An example of a 'straggling' actor is Prototum, mentioned earlier as an actor with only one involvement. Prototum is thus only part of one event-centred network element and has no function as a linkage between different network elements. In the structure formed by the interlinked event-centred network elements, Prototum has the role of a straggling actor in the periphery of the main component, i.e. the large core seen in Figure 7.4, linked to it through the acquiring actor Tietoerator, and thereby contributes to the spread and structural extension of the business network change sequence.

To assess the straggleness in a more large-scale analysis, a structural measure of the betweenness centrality is calculated for each of the 2406 actors. The betweenness

centrality is one of many different approaches to centrality in network structures (Freeman, 1979; Marsden, 2002), and this measure shows how important an actor is as an intermediary, linking other actors (Wasserman & Faust, 1994). More specifically, betweenness centrality is the proportion of all geodesics connecting all other actors that pass through the actor for which the value is calculated (de Nooy, Mrvar & Batagelj, 2005; Everett & Borgatti, 2005). The measure is thus not primarily intended to calculate the way a network extends, but the measure will identify the straggling actors, i.e. the white circles in the figure above, as they get a betweenness centrality value of 0. On a network level, this means that the extension of the forces in the presumed business network will be calculated as the share of the involved actors that have a betweenness centrality of 0, i.e. are outliers that contribute to the straggleness and extension of the structure formed by the event-centred network elements. The time consuming calculation of this measure for each actor can, fortunately, be done in Pajek, and compiling the results shows that 67% of the actors have a betweenness centrality of 0, which is the number that will be used as the structure extension. This means that 67% of the actors that are involved in the studied events are located in the periphery of the structures of change formed by interlinked event-centred network elements.

Structural
Extension

67%

This approach to the structural extensions indicator thus relies on the extent to which the event-centred network elements are interlinked. It is not an optimal representation of the structural extension, but is a compromise based on the available data. There is to some extent an overlap with the actor extension, caused by the fact that a higher number of involvements of an actor generally means that it acts as a link between changing network elements, i.e. contributes to the joining of the actors involved in mergers, acquisitions and bankruptcies to form a coherent structure. This intervention can be seen through the Pearson correlation between the total number of involvements in events and the betweenness centrality of 0.737, significant at <0.01 . The overlap naturally affects the contribution of this indicator to the understanding of the character of the studied business network change sequence, but the two indicators of extension do, however, differ. The most important difference is that the structural extension, approached through the straggleness, reflects how the event-centred network elements are interlinked and how the resulting structure(s) extends or consolidates. Furthermore, the spread of the involved actors in the presumed structure of the studied Swedish IT-related business network is highlighted through the focus on “outliers”, i.e. involved actors that are structurally dispersed from a possibly coherent core.

7.2.3 Product Type Extension

Assessing the product type extension means describing how the forces are distributed over different categories of actors in the changing business network, and in this particular analysis, the categorization is based on the product types of

the actors. The simplest way to look into this type of spread is to divide the actors, and primarily the actors involved in one or more event, over the four product types used to characterize the actors. Table 7.10 shows the distribution of the actors over the used product types and separates the actors in three categories based on the earlier analysis: not involved, sparsely involved (one direct and/or one related involvement) and frequently involved actors. The actors that are not involved in any event are not important for this analysis, but are included to show the total inclusion of the data set.

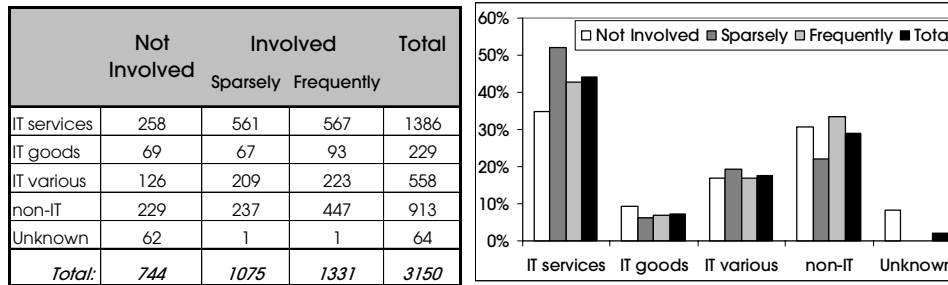


Table 7.10 Distribution of the actors over the product types

From this table, and the accompanying bar chart, at least two things can be seen: the distribution over the product types is very uneven, but at the same time appears somewhat uniform for the different involvement categories. Although the actors involved in the studied events, according to this analysis, are dominantly dealing with IT services, and to a little extent with IT goods, this conclusion is not enough to assess the product type extension. This product type distribution should be analyzed relative to the distribution of all the actors in the Swedish IT-related business network, which requires data beyond what is available in this study. The table shows that about seven times more IT service actors than IT goods actors are involved in the studied events, but if there are seven times more companies dealing with IT services than IT goods, this would prove an even spread, i.e. a high extension in this aspect. However, as no comparable numbers are available the product type extension cannot be assessed in this way.

To make use of the available data set, the product types can be analysed over the years, which means that the spread of the events over the product types is approached as differences in where the events occur over time. For such an analysis, each of the involvements, direct and through relations, can be ascribed the year of the event and the product type of the involved company. For an event analyzed with a network element involving five actors, this means that five different involvements will be analyzed based on the year of the event and the product type of the respective actor. The same approach was used when the total number of involvements was calculated for each actor and then analyzed to show the actor

extension in, for example, Table 7.7. In all, this gives a set of 19 618 involvements, and the distribution over the ten studied years for the four product types is shown in Figure 7.6.

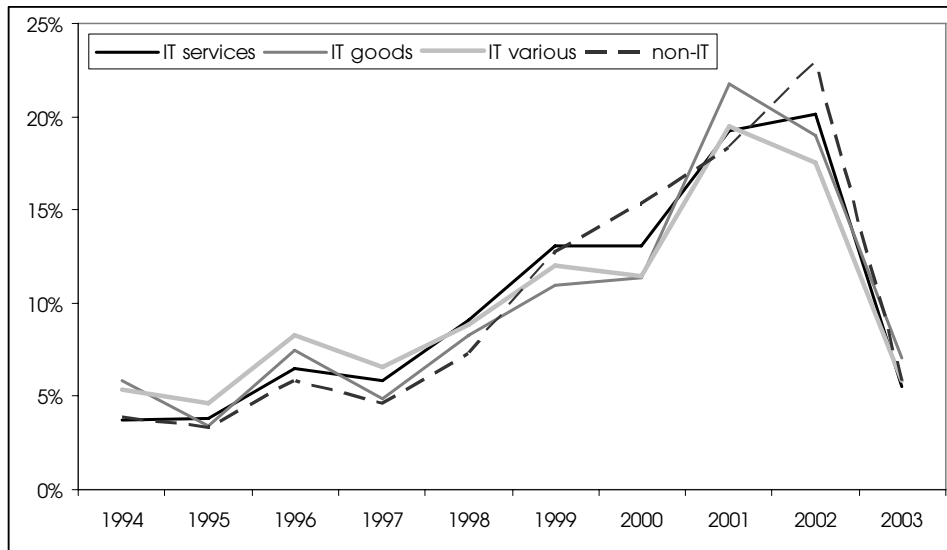


Figure 7.6 The distribution of involvements on product types over time

The shape of the curve is recognized from the earlier analysis of the temporal concentration of the events. As can be seen, there is a great concordance between the four lines, representing the four product types, and the Pearson correlations between the product types are in the range of 0.936-0.986, all significant at a level of <0.001 , which gives a Cronbach's Alpha of 0.887. So, no explicit differences can be found between the product type categories over time. This can be interpreted as an even distribution between the product types, which should mean a high product type extension, but a third analysis will be made to approach this indicator of extension in yet another way.

Events that involve actors of different product types can be seen to increase the product type extension through the implied diversity of the contexts of the forces, and the event-centred network elements should thus consist of a mixture of product types. This can, for example, be situations where a non-IT company is bought by an IT-company, such as the IT-company Nocom's acquisition of the market communication agency Hera in 2000. It can also be through relations, for example as the large Swedish newspaper Dagens Nyheter is likely to have been affected when the IT-profiled holding company Adera in 2002 acquired Teknik i Media, providing IT-solutions for media companies, since Dagens Nyheter was a customer to Teknik i Media.

A high degree of cross-product type involvements is here seen as a high product type extension. To study this, the same compilation of the data as in the assessment of the structural extension will be used, i.e. the data is formed to be a structure of the actors directly or through relations involved in events, joined by relations and events. This 'structure of change' was pictured in Figure 7.4 where a layout was applied to show the coherent core. In this analysis, the layout will instead be based on the product types. Therefore, the product type of each actor is included in the export from mabIT to Pajek in what is called a partition, which is a data list placing each actor in a group, in this case based on the product type. The result is shown in Figure 7.7.

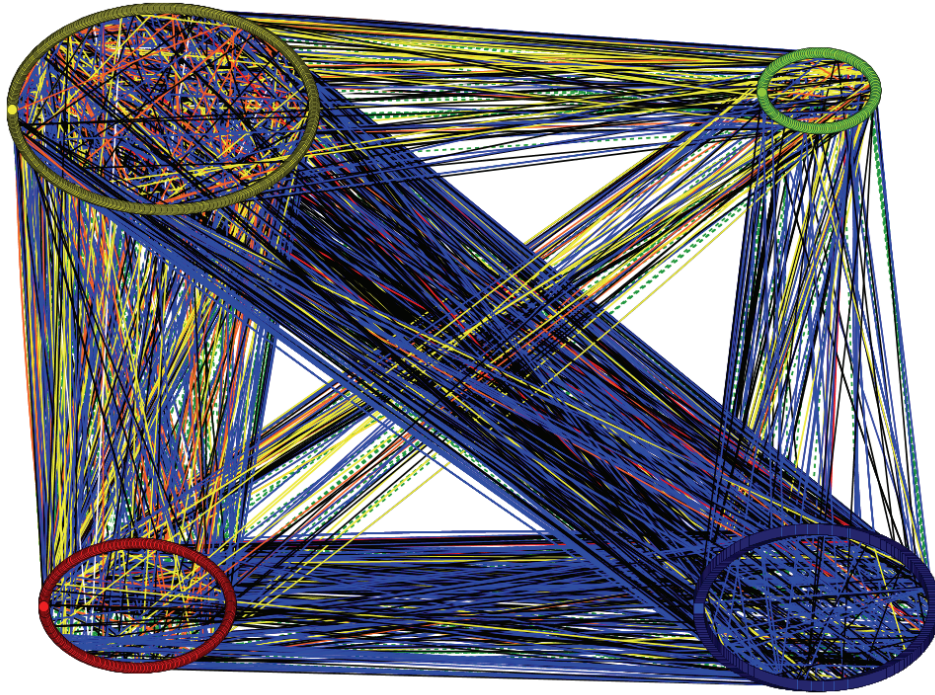


Figure 7.7 Layout showing involvements between actors from different product type groups

Upper left corner: IT service actors. Upper right corner: IT goods. Lower left corner: IT various. Lower right corner: non-IT actors. Dotted lines represent direct involvements and solid lines represent related involvements. The colours of the solid lines represent different types of relations.

In this picture, the IT service actors are placed in the upper left corner, IT goods in the upper right, IT various in the lower left and non-IT actors in the lower right corner. All involvements, either direct or through relations, that cross the product type group boundaries are shown through the lines going between any two of the

actor groups. A count shows that 64% of all lines are between two product types, whereas the rest are within a product type group. The involvements in the studied events are thus to a high degree of an inter-product type sort as many of the events involve actors of different product types, causing the involvements to span over different product types. To represent the value of the product type extension, the proportion of lines extending between product types will be used, and this indicator of the contextual extension of the studied business network change sequence is thus 64%, which is a fairly high number. The extremes of this scale are that no involvements run between different product types (0%) and that all involvements are cross-product type links (100%).

Product type
Extension

64%

7.2.4 Contextual Extension of the Business Network Change Sequence

The three indicators that have been analysed here together describe the contextual extension of the studied business network change sequence. What has been analysed is the spread of the forces, studied through the events, in various aspects. First was a focus on an extension in relation to the individual actors, which was found quite varying as some actors were found to be frequently involved in events but there was also a quite large number of actors with a very low number of involvements. Then followed an analysis of the structural extension of the studied business network change sequence, which addressed how concentrated or spread the event-centred network elements were in a hypothetical business network structure. This was assessed based on the 'straggliness' of the structure made up of inter-linked network elements, and was found quite high, meaning that the actors involved in the studied events are believed to extend quite widely. Finally, the contextual extension was analysed based on a categorization of the involved actors in four categories decided by their product types. The product type extension was analysed in various ways, and was found to be quite high, meaning that the studied events to a high degree involves the different product types.

Using the same procedure as for the combined intensity dimension, the overall contextual extension is calculated as $\sqrt{0.45^2 + 0.67^2 + 0.64^2}$, which is about 59% of the maximum value. The contextual extension of the studied business network change sequence is thus assessed to be 59%, which signals that the mergers, acquisitions and bankruptcies during 1994-2003 might have affected a quite large part of the Swedish IT-related business network, but the extension is moderated by the recognition of what seems to be a concentration of a noteworthy number of events to some specific actors.

Contextual
Extension

59%

7.3 Linkages between Event-centred Network Elements

This thesis and study, with the analytical model that was suggested in earlier chapters and used in the analysis in this chapter, clearly concerns business network change and characters of the change sequence formed by forces occurring within a business network. As has been clarified earlier, this study addresses a business network change sequence within what was defined as the Swedish IT-related business network. The study, and the presented analysis, has thus been assumed to describe a, to some extent, interlinked set of event-centred network elements. This section will look further into the studied parts of the IT-related business network by analysing the linkages between the event-centred network elements found in the data. This issue has to some extent been addressed in earlier sections, where a structure has been made from the somehow involved actors and their direct and indirect involvements in events. That reasoning, and the result shown in Figure 7.4, was an aggregated structure, and this section will describe the inter-linkages more thoroughly through a specific example before arriving at such a combined structure.

7.3.1 Inter-linked Network Elements

To keep it simple, only direct involvements in events will first be considered, that is involvements in an event as, for example, the acquiring, merging and bankrupt part. The events under investigation are the 961 events that were considered relevant due to the time and type of the event as well as the involvement of at least one Swedish IT-company, shown in the reduction in Table 7.1. Time indications at a year-level are available for each of these events, which makes this analysis quite consistent regarding time. All actors that are involved in an event can be considered to be linked to each other through the common involvement, which can be seen to form a 'core' of a event-centred network element. As the events can involve anything from one single actor (for bankruptcies) to many actors, the size of the directly involved core of the event-centred network elements can vary.

Figure 7.8 below shows two examples of such directly involved cores. These examples have been chosen because they are part of a quite large structure of inter-linked event-centred network elements, which will be shown later. To the left is a merger between Connecta and Information Highway, which formed a large Swedish IT-company, called Adcore, with about 1200 employees and a combined annual turnover of more than 500 million SEK. The actors are connected by dotted lines which illustrates that they have been directly involved in an event together. The right part of the figure shows an acquisition where Adcore bought another Swedish IT-company, Aseantic, with about 60 employees; an acquisition which Adcore in the press described as a way to strengthen the focus on digital bank services. These isolated sets of actors, connected through involvements in a specific event, are examples of the direct involvements in event-centred network elements. There is a large number of this kind of unit in the data; one for each event, and 830

of these, i.e. all but the bankruptcies and closures, directly involve more than one actor and thereby link two or more actors by the involvement in the same event.



Figure 7.8 Actors connected through direct involvements in an event
Part a), to the left, shows a merger between Information Highway and Connecta, from which Adcore was founded. In part b), to the right, is an acquisition where Adcore bought Aseantic.

These small and isolated cores of the event-centred network elements do, however, become a lot more interesting if they can be linked to each other. Both the events shown in the figure above took place in the year 2000, and both of them involve the actor Adcore. There is thus a rather evident link between the two presented units just through the direct involvements in the two mentioned events. This linkage of the event-centred network elements is based on an overlap of an actor, in this case Adcore, which was involved in more than one event during the same year. Important to note is the inclusion of time in this reasoning, respecting the temporal dimension by only connecting network elements that are formed around events that took place the same year. So, just as the two examples shown in Figure 7.8 could be connected, it is possible to build an even larger structure solely based on common involvements during one year. The result is an involvement-based structure of 11 actors and seven overlapping events, and Figure 7.9 below shows this continued linking of event-centred network elements.

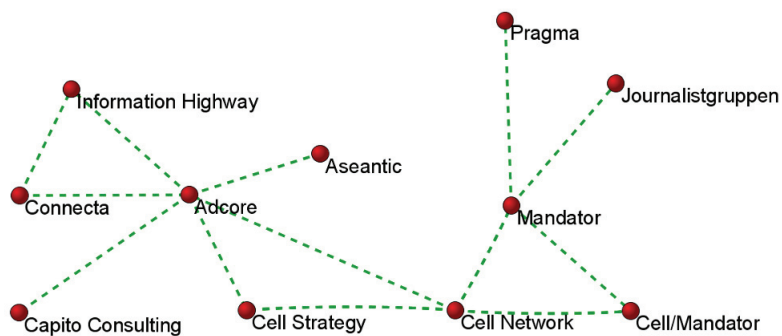


Figure 7.9 Structure of direct involvements
11 actors linked through involvements in 7 events. All events took place in the year 2000.

In the upper left part of this picture, the examples from Figure 7.8 can be recognized. This picture has, however, added more actors, joined by dotted lines which indicate direct involvements in events. Besides the Connecta-Information Highway merger is a merger between Cell Network and Mandator, forming the actor labelled Cell/Mandator. Furthermore are some acquisitions, as Adcore bought Capito Consulting and bought a part of Cell Strategy from Cell Network, and Mandator who bought Pragma and Journalistgruppen. What is shown is thus seven event-centred network elements, and the interesting thing to note is how they are linked through overlapping of actors, i.e. some actors are involved in several event-centred network elements. Such actors thereby link the different network elements and in this example, Adcore appears as the primary linker, through its involvement in four events. Cell Network is however also interesting as it joins the network elements around Adcore with those around Mandator.

In the example shown above, the event-centred network elements form a kind of 'chain', based on the multiple involvements of several actors, making it quite a wide structure. The structures of inter-linked network elements can however take different forms, and an example of another shape is shown in Figure 7.10, where one single actor's frequent involvement in different events is what constitutes the linkages. In this case, it is the Swedish IT-company Sigma, which was a frequent acquirer in 2000, and the structure is thereby more like a star, with Sigma as a clear hub. The dotted lines again shows direct involvements, in this example BPO and Sigma Integra merged, but the seven other links, extending from Sigma, are acquisitions with Sigma as the acquirer.

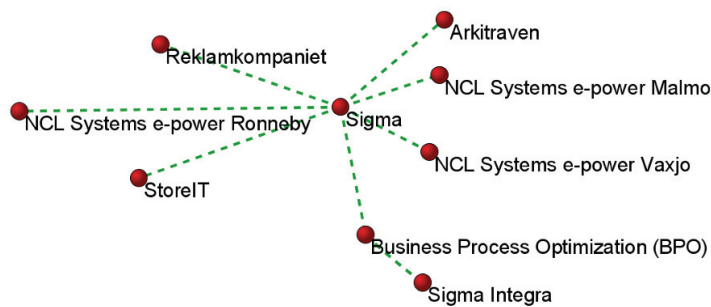


Figure 7.10 Star shaped structure of direct involvements
All eight events took place in the year 2000 and are centred on Sigma, the acquirer in these events.

What has been shown here is that the bare overlapping of event-centred network elements, together with linkages through the direct involvements, indicates a coherence of some of the studied events. It is possible that the inter-linked events have some kind of effect on each other, but such connections between individual

events are beyond the scope of this study. It is however rather clear that the structures formed by inter-linked event-centred network elements represent a highly changing part of the Swedish IT-related business network. These kinds of structures can be quite large. In the used data set, the largest structure based on direct involvements in events during one specific year contains 57 actors, mainly based on events involving the large IT-companies Tietoanator and Frontec, but also a major restructuring of Ericsson-owned companies. This analysis of linkages between different parts of the changing business network has however been limited by only including direct involvements, and following the earlier reasoning, also involvements through relations should be considered in an analysis of events in a business network setting.

The next step is thus to add relations between companies to this analysis of the linkages between event-centred network elements. So far, the temporal aspect has been respected by only linking direct involvements from the same year, and this temporal consistency will be continued for a while. Unfortunately, as was described in section 6.1.3, the majority of the known relations do not have sufficient time information, so using the 3408 relations in the same way as the direct involvements is not possible. However, the 135 relations for which sufficiently specified time indications have been found can be added to the analysis of direct involvements without interfering with the temporal consistency. By doing this, some structures of connected relations appear, but what is most interesting is how these relations can link structures of direct involvements, such as have been described in this section hitherto. In the year 2000, where the structures in the earlier examples were found, Telia is known to be a customer of Sigma, but also to the newly merged Cell/Mandator, through a general supply agreement. The two structures shown earlier, i.e. the 'chain' involving Cell/Mandator in Figure 7.9 and the 'star' involving Sigma in Figure 7.10, are thus linked through the relations to Telia. What turns out is, however, that not only do Telia link these two structures of event-centred network elements, but it also connects them to even more event-centred network elements. So, when including the direct involvements as well as the timed relations, an inter-linked structure of not less than 40 actors appears, and this is shown in Figure 7.11. In this way, relations link event-centred network elements and thus increase the degree to which the studied event-centred network elements form an inter-linked structure.

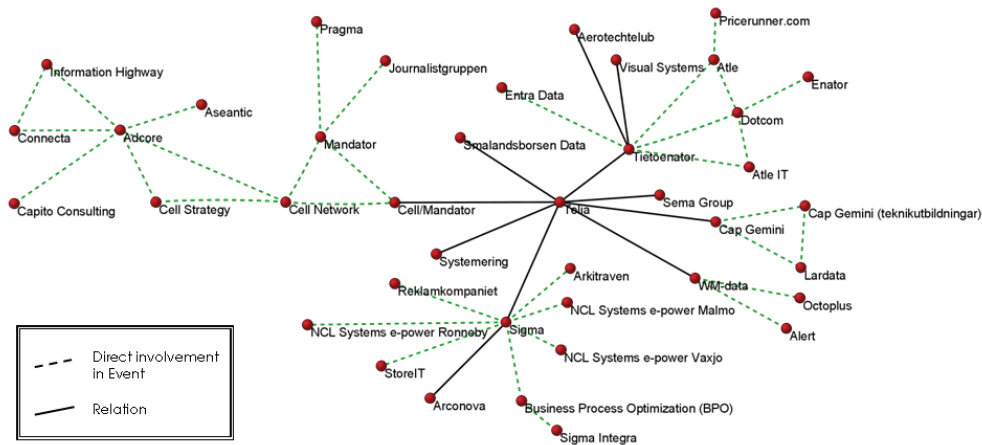


Figure 7.11 Structure of actors linked through relations and direct involvements
All events took place in the year 2000, and all relations were active during that year.

This analysis has so far showed inter-linked structures of event-centred network elements by joining direct involvements in events and relations between actors that took place the same year. It can naturally be considered whether it is relevant to see a link between an event that took place in, for example, January 2000 and an event in December 2000, but not between an event in December 2000 and one in January 2001. The delimitation must, however, be made in some way, and as the time indications have been decided on a year-level, it is also reasonable to group the involvements on a year basis. This discussion does, however, opens up for an analysis of the inter-linkages of the data without acknowledging the temporal dimension. When approaching the data in that way, all the direct and/or indirect involvements are treated as existing at the same time, and are thus aggregated. This naturally results in much larger coherent structures, although doing so may link relations or involvements from 1994 with such from 2003, but that issue will have to be disregarded in the following analyses.

7.3.2 Intra-linkage of the Data Set

When leaving the specific examples, and turning to the intra-linkage of the entire used data set, the following analysis will make use of the Social Network Analysis software Pajek. To do so, the actors, relations and direct involvements are exported to Pajek, wherein each relation and direct involvement is included as an undirected line, called 'edge'. When having the actors, relations and direct involvements in Pajek, a rather simple analysis of the resulting structure is sufficient for this purpose. The data is divided into so called 'components', which are subsets of the network within which each vertex (actor) can be reached from each of the other vertices (actors) (de Nooy, Mrvar & Batagelj, 2005). As the relations used in this

study are undirected, in Pajek called ‘edges’, rather than directed, called ‘arcs’, a component is actually an isolated sub-network. The lower threshold for the size of a component is set to two actors since unconnected, lonely, actors are per definition not part of any connected structure. Each component is assigned a number by which it can be identified and distinguished, and this is handled in a so called partition in Pajek.

After identifying the components, four interesting variables will be analysed. One is the number of isolated actors, i.e. actors that are not connected to any other actor. This is interesting as it shows how large share of the studied actors that is not known to be part of the assumed structure that the studied IT-related business network should imply. Another interesting aspect is the number of components (≥ 2 actors), which shows the scattering of the actors that are related to at least one other actor. A high number of components means that there are many, hence small, sub-structures in the data, which is interesting when considering whether the study concerns an intra-linked phenomenon. Third is the size of the main component, which shows how large proportion of the actors that comprise one structure of inter-linked network elements. If a ‘whole’ business network could be captured, and nothing more, all actors would form one big component. As that has not been the objective of this study, the size of the main component is instead used to discuss to what extent the data can be seen to represent a coherent structure. Finally, the size of the second largest component is interesting, or more precisely the proportion between the main component and the second component. A smaller ratio can be interpreted as a more even scatter, whereas a high ratio is a sharp contrast that indicates the existence of a distinct primary component.

Table 7.11 on the next page shows a compilation of these variables for five different sets of data, with varying inclusion of relations and events. If starting with only including the events considered relevant for the prior analysis, those 961 events gives a total of 1681 direct involvements. The analysis of only the **relevant events** shows that quite a large coherence and a large number of inter-linkages is obtained just from the direct involvements, which was also indicated in the examples of inter-linkages between event-centred network elements shown earlier in this section. When disregarding the temporal aspect, 1840 actors are found to be unrelated and isolated, which on the other hand means that 42% of the 3150 actors are in some way related to at least one other actor. Furthermore, 17% of the 3150 actors are in fact linked to form the main component. If instead relating the size of the main component only to the actors that in some way are related to other actors, thereby disregarding the isolated ones, a respectful 40% are part of the main component. This means that the studied mergers, acquisitions and bankruptcies show good signs of being connected to each other, and that a business network perspective could be suitable when studying such events.

	Included		Isolated Actors		Components (≥2 actors)		Main Component		2 nd Component	
	Actors	Relations	# Actors	Share of total actors	# Comp. in Average	Actors / Component	# Actors	Share of total actors	# Actors	Proportion Main : 2 nd
Relevant Events	3150		1840	58%	253	5	521	17%	16	33
Relevant Events + Timed Relations	3150	135	1743	55%	248	6	642	20%	16	40
Relevant Relations	3150	2641	1323	42%	104	18	1541	49%	8	193
Relevant Events + Relevant Relations	3150	2641	768	24%	104	23	2067	66%	15	138
All Events + All Relations	3150	3408	63	2%	159	19	2633	84%	11	239

Table 7.11 Characteristics of aggregated structures

Data sets containing relations and/or direct involvements.

If then adding the relations where a sufficient time indication is registered, the effect of also considering relations and related involvements in events is evident. As have been described earlier in this section, the number of timed relations are only 135, but as can be seen in the table, and more precisely the row with **relevant events + timed relations**, these 135 relations reduces the number of isolated actors by 97. They are thus important for the inclusion of actors in this line of reasoning, but they also increases the size of the main component with 121 actors, which indicates the relations' importance to the inter-linkage of the network elements, as could also be seen in the example given earlier. To look further into the structure obtained by the relations, the third row in the table only includes the **relevant relations**, as defined in section 7.2.2. The analysis shows an even lower number of isolated actors, and a coherent main component of 49%, or 84% of the somehow related actors. If disregarding time and not including the direct involvements in events, this study address at least a coherent network of 1541 actors. The contribution of the relations to the coherence of the data is thus significant. When then joining the **relevant events + relevant relations**, the combined contribution to the linkage of the actors is evident. Only 24% of the actors are isolated, and the main component is as large as 2067 actors, i.e. 66% of the 3150 and 87% of the non-isolated actors. This set is very similar to what was used in section 7.2.2, but that analysis, of the structural extension of the business network change, only included the actors with at least one direct or related involvement, so the set of actors included is therefore different from what is analysed here.

The last row in Table 7.11 represents an inclusion of relations and events that is wider than what has been analysed in this chapter, but includes all the collected and refined data, as was presented in chapter 6. Doing so shows a dramatic decrease in the number of isolated actors and the size of the main component, which demonstrates the composition of the entire data set, and can be seen as a sign of the potential of it. The 63 isolated actors that remain when **all events + all relations** are included are, for example, actors that have gone bankrupt and for which no relations are known. The main component extends to include 2633 actors, 84% of the total number of actors, which is a quite substantial size of an intra-linked network structure. It should, however, be noted that this structure disregards time and includes a wide variety of relations and events.

Starting at the top and moving downwards in the table shows some trends. One is the reduction of the number of isolated actors, in which quite large decreases can be seen as more and more actors are included in linked structures. Another is a constant increase in the size of the main component which shows a larger coherent structure with the less strict delimitation of what is included. Some non-ordinal observations can also be made. One is the number of components which seems to be lowered mainly by the relevant relations, but then increases with the inclusion of all events and all relations. This is believed to be caused by the addition of odd relations and events, which on one hand reduces the number of isolated actors, but

mostly creates new small components rather than links the actors to the existing components. If following this line of reasoning, the set of relevant events and relevant relations would be the one most accurately representing a coherent phenomenon, and that is also what most of the analyses have been based on. Another aspect worth noting is the proportion between the main component and the second largest component, which is significantly lower for the first two data sets compared to the others, indicating a slightly more even spread of the actors over the components. However, the proportions are all quite large, as the main component is between 33 and 273 times larger than the second largest component.

The analysis made here about the connections between the event-centred network elements illustrates the intra-linkage of the data used. To a varying degree, the data thus represents inter-linked actors and events, and the use of it to study business network change is thus justified. This chapter has assumed that the gathered data represents a business network change sequence in the Swedish IT-related business network, and the analysis it has thereby described the studied events as one sequence. The descriptions of the intra-linkage of the data, at both a micro level and an aggregated level, substantiate the belief that the mergers, acquisitions and bankruptcies indeed can be seen as one sequence, but also shows that adding relations increases the intra-linkage which is a strong argument for not only studying chains of mergers and acquisitions, but that a business network perspective significantly contributes to the understanding of such events as one phenomenon.

This analysis has been possible due to the data collection and handling technique used, and a similar result might not have been possible with other types of methods, such as interview-based case studies. The large amount of actors, relations and events is one such advantage, and another is the fact that what has been analysed in order to find these inter-linkages is connections in third, fourth or even more distant lines which probably would not be revealed through an actor-focused data collection and analysis. This analysis of the linkages between event-centred network elements has thus shown some qualities of the data structuration technique used, not least the data handling and analysis it enables.

7.4 Concluding the Business Network Change Sequence Analysis

As outlined in the beginning of this chapter, the conducted analysis has given a description of a change sequence among Swedish IT-companies, but it has also been an explorative test of the suggested force-based approach to business network change together with the data structuration technique used. The analysis of mergers, acquisitions and bankruptcies involving Swedish IT-companies during a ten year period ranging from 1994 to 2003 as dynamics forming a business network change sequence resulted in a description of the situation as being characterized by a rather high intensity and wide contextual extension.

The result of the directed analysis is, naturally, highly dependent on the way the assessments have been made, and not least the measures used. The two dimensions, and six sub-indicators, suggested to describe the character of a business network change sequence have been exploratively analyzed, and various measures to numerically assess the components have been suggested. The measures used should not be seen as the ultimate way to describe business network change, as finding such has not been the objective of this work. Instead, they should be regarded as examples of how the characters of a business network change sequence can be described by using relative scales which offer comparability. In some parts of the analysis, additional data describing the larger setting in which the studied events occur would have been useful in order to assess the dimensions in relation to the wider setting, e.g. the number of different companies. However, the idea behind the pursued approach to business network change was to focus the changing parts, rather than the continuous structure, and the conducted analysis does show the possibility of such an approach.

This chapter has also shown how actors, relations and involvements in events can be linked to form structures of inter-linked event-centred network elements. The analysis showed an interesting and quite large example of such inter-linkage, obtained both from individual actors' multiple involvements and from relations between actors. When disregarding the temporal aspect, analysis of the entire data set showed a quite wide linkage where a large share of the actors were part of a coherent structure.

This leads to the data structuration technique and the obtained data set. The directed analysis reported in this chapter makes up a small share of the work behind the study, containing preparation, arrangement and refinement of the data. The design of mabIT turned out to be of great importance as the interrelatedness of the data, created from the use of a relational database, enabled the different forms of calculations and arrangements of the data. The used method to collect, code and handle data has however turned out to be quite usable, and although more data was sometime wanted, the obtained data set gave quite a number of analyzable units. Besides the business network change sequence level, where only one unit has been studied, this directed analysis has been given the opportunity to analyse 961 events and event-centred network elements, 2406 or 3150 actors (depending on the focus) and 19 618 involvements. With this data set, the suggested dimensions, indicators and measures have been used to describe the character of a business network change sequence from information about events, actors and relations through the suggested approach, which sets the focus on the forces underlying the change. The study has been exploratory rather than confirmatory, and offers valuable learning about the data structuration technique, the force-based approach to business network change and not least the assessments of the dimensions and indicators suggested to describe a business network change sequence.

8 Concluding Discussion

A concluding discussion is at its place now that the end of this work is reached, and this last chapter is therefore focused on this thesis' accomplishments, their relevance and quality, but also future challenges set by them. Although the prior chapter contained an analysis of the characters of a business network change sequence within the Swedish IT-related business network, the accomplishments of this thesis are wider than so, and concluding the accomplishments of this work is closely related to the purpose and research questions expressed in the introduction.

The first research question concerned how business network change can be approached and described, so the first of three main contributions is thus the **force-based approach to business network change**, and not least the descriptive framework. The second research question was focused on how business network change can be studied empirically, where the **data structuration technique** is one of the accomplishments, but also the adaptation of the suggested approach to the studied situation, including the introduction of events and network elements as ways to enable an empirical application of the approach, is important. Third, a question was posed addressing how the mergers, acquisitions and bankruptcies involving Swedish IT-companies could be described from a business network perspective. This question was addressed in the empirical study where the analysis described a business network change sequence within the Swedish IT-related business network, showing **mergers, acquisitions and bankruptcies as linked events**. Altogether, the achievements of the thesis have furthered the understanding of business network change and its underlying dynamics in various ways, but before going further into the results of this thesis, the study of mergers, acquisitions and bankruptcies involving Swedish IT-companies as a business network change sequence will be returned to.

8.1 Types of Business Network Change

The previous chapter analyzed a change sequence in the Swedish IT-related business network by considering mergers, acquisitions and bankruptcies as events giving rise to forces underlying change. The analysis has been made in line with the two dimensions suggested to describe business network change, intensity and contextual extension, and the three indicators of each dimension. Through this descriptive framework, the business network change has been described based on the occurrence, characteristics and immediate contexts of these events.

The analysis of this situation found a mediocre temporal concentration and a rather high radicality. Furthermore, a very high amount of forces was assumed, but was

not included in the numerical analysis due to the difficulty of making a relative scale. The intensity dimension of the character was thus not homogenous, but the combined intensity was assessed to 65% of a potential maximum value, based on numerical measures suggested for two of the indicators. The second dimension was the contextual extension of the change sequence, intended to represent the spread of the forces over the business network and analyzed through characteristics of the immediate contexts of the studied events. Whereas the level of actor extension was reduced from a partial concentration of the events to some individual actors, the structural and product type extensions were more convincingly high and the combined contextual extension was calculated to 59%, using all three indicators. The studied case is in Figure 8.1 positioned in a matrix showing the intensity and contextual extension, visualized somewhat representative of the found levels.

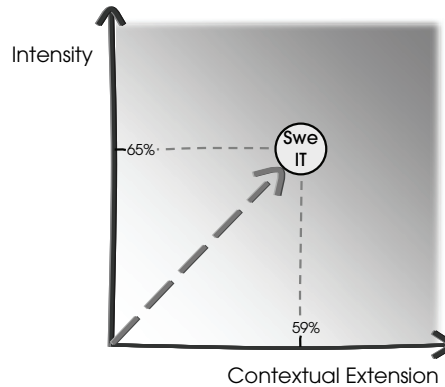


Figure 8.1 *The character of the studied business network change sequence*
 Matrix describing the studied change sequence in the Swedish IT-related business network 1994-2003 in terms of intensity and contextual extension.

Brought together, the two dimensions show the combined character of a change sequence, here called the ‘impact’ of the business network change sequence as it includes how much and how widely spread the presumed change has been. What this indicates is the joint effect of the intensity and contextual extension, and to get a high value, the intensity as well as the contextual extension must be high. So, if continuing the numerical approach, the combined character of the studied business network change sequence, being a vector made up of the intensity and contextual extension dimension, can be calculated as $\sqrt{0.65^2 + 0.59^2}$, which gives a relative value of the combined character of 62%, i.e. almost two thirds of the maximum possible value of the used measures. The suggested dimensions and indicators are believed to cover important, and complementing, aspects of business network change. The indicators address different aspects of business network change, but in this study’s tentative

Combined
Impact
62%

use, some of them showed to be partially overlapping, so alternative measures could be considered in order to distinguish the indicators more clearly.

8.1.1 Turbulence in Business Networks

When introduced in the first chapter, the studied situation was described as “turbulence among Swedish IT-companies”. The word ‘turbulence’ was thus used to denote a situation assumed to contain a lot of change, just as news items report on turbulence in markets, industrial sectors and the stock market. A search in the three studied newspapers shows that the Swedish words for ‘turbulence’ and ‘turbulent’ have been used in 1063 news items during the ten years included in the study. When this turbulent situation is analyzed with a business network view, as have been done in this study, it appears as a business network change sequence characterized by high intensity and wide contextual extension, and following the labelling of the empirical situation, this type of business network change is suggested to be called ‘turbulence in business networks’.

The word ‘turbulence’ means “violent commotion, agitation, or disturbance; disorderly or tumultuous character or conduct [...] stormy or tempestuous state or action; violence.” (Oxford English Dictionary), and more specific, in fluid mechanics: “a flow condition [...] in which local speed and pressure change unpredictably as an average flow is maintained.” (Britannica Concise Encyclopedia). The term ‘turbulence’ has been used to describe, for example, the IT-sector (e.g. Bonfield, 1993; Robbins, 1995), business relationships (e.g. Hadjikhani, 1998) and business networks (e.g. Salmi, 2000). It is sometimes used to label a type of environment (e.g. Grant, 2003; Thurow, 1995; Xavier & Hunt, 2002), and Emery and Trist (1965) describe turbulent fields as environments disturbed by a high rate of change, interdependence among environmental elements and high uncertainty; a definition used in some research (e.g. Achrol, 1991; Dowling, 1983). It is based on changeability and predictability (Thwaites & Glaister, 1992), for example of the price level (e.g. Grant & Cibin, 1996; Morris & Schurink, 1993) or the development of markets and technologies (e.g. Morgan, 1999; Pelham, 1999; Wang, 2007). Additionally, measures of turbulence have been developed based on, for example, familiarity, hostility, heterogeneity, uncertainty, complexity and volatility (Calantone, Garcia & Droge, 2003; Rissman, 1997) but Woodward (1982), on the other hand, questions the use of turbulence as a concept, and means that it should be used as a subjective perception.

Despite the variety in the meaning ascribed to the term ‘turbulence’, the literature briefing shows that it is not just a buzz-word, but can in fact be meaningfully defined. Some of the definitions of turbulence use words such as ‘disorderly’, ‘unpredictability’ and ‘uncertainty’, and when brought into the business network perspective, this implies that the fundamental mechanisms of the business network are seriously challenged. So, without defying either the dictionary or the business literature definitions, and remaining in line with the approach pursued in this thesis, turbulence in business networks is defined as situations where the business network

change is characterized by a high level of both intensity and contextual extension. When turbulence reigns, a large amount of forces occur during a limited period of time, being of the more radical type, and affecting a large part of the business network. This definition is clearly compatible with the view in Calantone et al. (2003), where turbulent markets are characterized by continuous changes in demand, price and competition, and cause a dissolution of traditional industry boundaries. A similar blurring of industry boundaries can be seen in this study as the inter-linkages between different product types, and especially the mixing of IT-companies with non-IT companies. Although not explicitly analyzed, a notable amount of the non-IT companies that were highly involved and related to the IT-companies in the study are telecom companies and advertising agencies. The telecom sector is largely an application of IT, both in the form of hardware and software, so that overlap is not very surprising. One reason for the relations and involvements between IT-companies and advertising agencies is believed to be the emergence of the web design business, which is a mix of artistic work, publicity and programming.

8.1.2 Four Types of Business Network Change

Situations of high impact are thus labelled 'turbulence', and are located towards the upper right corner in the intensity-contextual extension matrix showed in Figure 8.1. If dividing each dimension in two parts, low and high, the continuous matrix turns to a four-field matrix. The type of business network change labelled turbulence can now easily be contrasted with the other three types, and this is shown in Figure 8.2 below, where labels have been assigned to all four quadrants. The identification of these four types of business network change is, however, not part of the empirical study, and is thus not substantiated by the empirical results but rather an inference from the suggestion of the descriptive dimensions. This typology can be a first step towards a further theorizing of business network change (cf. Doty & Glick, 1994).

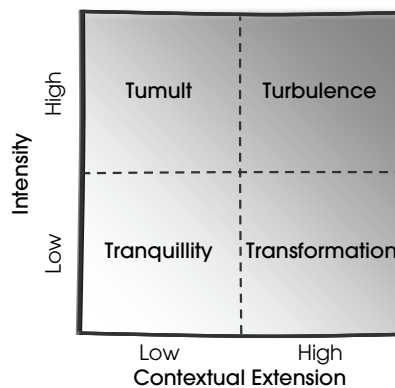


Figure 8.2 Matrix describing four types of business network change

Starting with **tranquillity**, this is the type of business network change where the impact is the lowest as both the intensity and contextual extension of the change is low. This means that few forces act on the business network, they are evenly spread over time and are mainly adjustive. Furthermore, the forces that do occur are concentrated to a very small part of the business network, thereby only affecting a small set of actors, which are homogenous in terms of product type, and only a confined part of the business network structure. Business networks undergoing **transformation** experience a change characterized by low intensity but high contextual extension. This means that the forces are still relatively few, distributed over time and mainly adjustive, but the forces affect a large part of the business network, i.e. many different actors, product types and parts of the structure. The transformation type of business network change is thus a rather mild type of change, but affects a large part of the business network.

In situations of **tumult**, the business network change has a high intensity but low contextual extension. In other words, a lot of change takes place, but is confined to a small part of the business network. Many forces, which also are of a radical type, occur during a relatively short period, but only involve a limited set of actors and product types, and a minor part of the business network structure. If only looking at the level of combined impact, i.e. the size of the vector, the tumult and transformation types of change can be hard to distinguish. This means that there is a good reason to use the two dimensions, intensity and contextual extension, rather than the combined vector, to describe the character of business network change sequences. The fourth type, **turbulence**, has already been defined as being high in intensity as well as in contextual extension. These four types are highly relative, and the division makes a rather reasonable separation of the dimensions into (relatively) high and low, but even though this study has only analysed one situation, and thus only has empirical substantiation of one of the four, these different types of change are all believed to be possible situations. The studied business network change sequence within the Swedish IT-related business network can be positioned in the typology despite the absence of other cases, to which it can be related, since relativity was incorporated in the dimensions and indicators. For each indicator, the character of the studied business network change sequence has been related to the possible minimum and maximum values, which, at least hypothetically, makes all four suggested types possible. So, empirical examples of tranquillity, transformation and tumult cannot be given in this thesis, but the suggested typology is believed to show four distinct types of business network change sequences. This result can be brought back to the analytical model as four distinct characters of business network change sequences, given by the two dimensions.

8.1.3 The Implications of the Different Types

The four different types of business network change suggest that change sequences can have highly varying characters. The used dimensions and indicators enable the distinction of nuances in change, and clearly include more than adaptations and

reinforcements. This study has had a strong focus on change, but it is also relevant to consider how stability relates to the described types of change. When business network change sequences were introduced in Chapter 2, the trend in the change of the business network was described as a kind of ‘trajectory’. If returning to that idea, stability can be seen as a kind of evenness of the business network change, i.e. an evenness in the alteration of its trajectory. Stability would thus be a situation in which the business network change follows a dominant trajectory, and unlike those who claim that a business network never can be seen as a stable structure, this view regards stability as a type of change, not as an absence of change. This is well reflected in the least changing of the four types, labelled tranquillity, which implies that also relatively stable situations are a type of change. ‘Tranquillity’ should however not be confused with ‘stability’. In the used view of business network change, stability is considered to be a state where the stabilizing mechanisms are functioning and the occurring forces do not overly challenge the business network. Stability is thus primarily part of the intensity dimension of business network change, which means that stability certainly can prevail in tranquil situations, but is also possible in situations of transformation. The only situation not covered by the four types of business network change is when no forces occur at all, which is not believed to be a plausible situation. So, even though the nature of business networks was not within the scope of the thesis, this suggests that business networks indeed are of a changing nature, and the character of a business network is to be described as more or less changing.

The conditions for the individual company vary considerably depending on the type of change, and the four described types of business network change could therefore be considered four types of ‘settings’ for companies to act in. The difficulty of foreseeing the results of an action might depend on the character of the setting, and understanding the current setting could thus be a key issue in successful management. In a more stable, and thus predictable, setting, management can to a greater extent rely on routines and control (Hedaa & Törnroos, 2002), and although various adaptations may always be required, the frequency, type and result can vary depending on the changeableness of its context. The effect of individual companies’ actions can vary depending on the setting, and whereas adapting in tranquillity can be a large step, similar actions could seem futile in a turbulent setting where larger changes dominate. As changes occur, the structure of the business network is altered and new openings appear. Such openings can create opportunities to, for example, develop new business relationships and end current commitments, which means that change can increase the likelihood of more change, and an absence of change is thereby an unexpected state. If such a change loop accelerates, turbulence in a business network may arise also from change of a seemingly low impact.

8.2 The Force-Based Approach to Business Network Change

This thesis started with a quote from Heraclitus and a reasoning about the potential importance of the conception of the change of an object for the general understanding of it. Rivers were apprehended as being rivers much because of their evident change, whereas mountains mainly are characterized by their stability. As the introduction made clear, this research has not been made with a primary ambition of deciding the ‘nature’ of business networks. Instead, the ambition behind the study was to enable business network change to be approached and described, both conceptually and empirically.

The first, and primary, contribution of this thesis is thus the force-based approach to business network change, which offers a way to approach and describe business network change based on the underlying dynamics, and thereby addresses a largely unstudied area and level of analysis. The approach has been developed from literature on business networks as well as fundamental physics, and important learning has been made from the explorative application of it in the empirical study. An explicit focus is set on changes, and to make the change appear even more clearly, this thesis has primarily focused on potential changes of a relatively large scope. The basic idea is that various events may affect the business network structure in which they occur. This potential effect is seen as forces acting on the business network and the overall business network change is a sequence of all the inter- and counteracting forces. One of the accomplishments of this approach is that by focusing on forces causing change, the dynamics underlying business network change can be studied without having to capture an entire business network structure and the alterations thereof. This also enables wider studies of business network change, which may have some implications for the view and understanding of business networks.

Following this approach to business network change is also a possibility to describe business network change based on the forces acting on it. A framework to describe business network change based on two dimensions was suggested, reflecting the intensity and contextual extension of the change. Whereas the intensity is assessed based on the occurrence and characteristics of the forces, the contextual extension reflects where the forces act in the studied business network, based on their immediate contexts. Together, these two dimensions have been used to form a four field matrix, which distinguishes four types of business network change: tranquillity, transformation, tumult and turbulence. The most changing situation, i.e. with high intensity and high extension, is here labelled ‘turbulence in business networks’, and this is an interesting situation as a large amount of forces, of rather radical type, occur and affect large parts of the business network. This is believed to seriously challenge the business network and its governing mechanisms. All the revolving changes are potentially causing even more changes, as restricting structures are broken and new opportunities arise in a turbulent vortex.

The typology, dimensions and indicators enables descriptions and studies of the characters of business network change sequences, and the framework for describing business network change are thus some of the main accomplishments of this thesis. In the empirical study, where the analytical model was applied to mergers, acquisitions and bankruptcies involving Swedish IT-companies, the dimensions and indicators were shown to be relevant and to complement each other, despite some overlap, as they addressed different aspects of the character of a change sequence. The empirical analysis also led to the suggestion of ways to numerically assess all the indicators but one, and although the measures should not be seen as ultimate representations of the characters of a business network change sequence, they further specify the meaning ascribed to the different indicators.

The business network perspective addresses the inter-relatedness of companies, and the complex inter-linkages of business activities. It is therefore reasonable that dynamics, and change, are also handled as one phenomenon, and the suggested force-based approach to business network change is believed to do so. Individual changes, or more correctly the forces causing changes, are seen in the context of others. The overall business network change is thus possible to study through the joint effect of all individual forces, and not only does this approach handle change at a business network level, it also enables a view of the occurring events as inter-linked phenomena. Business networks can, as have been described, be understood in different ways, and this study has had a structural view and has handled the changes at an aggregated level. The proposed approach is an example of how business networks can be handled and studied as structures, which opens up for a furthered understanding of business networks as structures.

8.2.1 The Captured Type of Change

The suggested force-based approach offers a way to conceptually and empirically understand and handle business network change, but like all models, it is a simplification of the complex phenomenon it is representing. The rigour of a model thus largely depends on the assumptions and simplifications made. When using the force-based approach as a model of business network change, it is thus relevant to consider what it models, based on the assumptions and simplifications made. In the ambiguity of the word 'change', it is important to understand that it is not the alterations of business networks, but the underlying forces, that are focused upon in this approach. Instead of capturing the prevailing structure, and studying change by looking for alterations of that structure, this approach captures business network change based on events giving rise to forces that potentially cause such alterations. So, instead of an under-emphasis on change, this force-based approach is rather likely to over-emphasize change. A 'true' picture of the change of a business network would require the 'entire' network structure to be captured along with 'all' the alterations, which is an unrealistic ambition, and this thesis' interest in business network change therefore makes the over-emphasis on changes not only acceptable, but something of a necessity.

A somewhat simplified analytical model was used in order to make the exploratory empirical application of the approach possible. For example, the theoretical line of reasoning behind the force-based approach to business network change separated events from forces and included a filter of stabilizing mechanisms that moderates the effects of the forces, but those parts had to be reduced to make this study possible. A limited set of events were focused, as only mergers, acquisitions and bankruptcies were included. Furthermore, the distinction between events and forces, which is considered a highly relevant part of the force-based approach, was largely disregarded, and events in some parts directly represent forces. The studied events were thus assumed to give rise to certain forces, and the variations in characteristics in events and forces were thus largely overlooked.

The stabilizing mechanisms were also disregarded, thus including all occurring forces in the resulting business network change sequence, which is a simplification that lowers the precision of the model. These simplifications, made to enable the empirical study, in a way mean that the suggested force-based approach to business network change has been reduced to a description of the “output”, i.e. the resulting business network change, solely based on the “input”, i.e. the events, and the connections and mechanisms in-between are thus not included in the reported study.

8.2.2 Further Development of the Approach

The suggested force-based approach has been developed and applied in this thesis, but as it is in an early stage, there are many needs for further development. Starting in the simplified model that has been used in this study, the suggested dimensions and indicators can be developed further, for example with inspiration from other research, and so could the way the indicators have been assessed. Furthermore, the entire force-based approach, including the dimensions, indicators, measures and the suggested typology of four types of business network change, could doubtlessly be refined if applied to more situations; the typology would be far more substantiated if situations of all four types were found and described.

Mergers and acquisitions are made quite frequently worldwide, and their impact on business to business marketing is an important topic (Sheth, 2007). Some parts of the force-based approach that have not been explored in this study, but were reduced in the simplifications made, could be worth looking further into. One such issue is the distinction between events and forces, where the effects of different events, together with the causes behind the events, could be focused upon to further the understanding of the contextual effects of such events, for example through describing ‘netquakes’ in business networks (Dahlin et al., 2005). The studies of business network change could also be continued on a lower level of abstraction, by looking further into the actions of individual actors; how different actions can cause various types of change as well as how change can lead to various actions. The potential bi-directional relationship between events and forces could thus be considered, which might make ‘loops’ of change natural to consider,

thereby relating to concepts such as ‘domino effects’, ‘M&A waves’ and ‘contagiousness’.

The connection between forces and business network change could likewise be looked further into, not least regarding the stabilizing mechanisms, which were argued to moderate the effect of forces, and even eliminate some forces. These mechanisms, arising from the current structure, become a kind of inertia. If looking further into the business network structure, the suggested approach may be furthered by including nuances of the business network through variables representing characteristics of the business relationships and connections. Both the stabilizing mechanisms and the resulting business network change could potentially be further understood by acknowledging variations in business networks.

8.3 The Data Structuration Technique

This thesis has also described a data structuration technique, which works through a coding scheme and software tool to structure a large amount of small pieces of information in order to form a larger puzzle. The data structuration technique enables empirical studies of business network change from available sets of data, in this case news items. The current implementation of the data structuration technique, called mabIT, gave a considerable amount of observations, together forming an interesting case of a business network change sequence within the Swedish IT-related business network. It enabled a study of business network change as a wider phenomenon, and made a varying analysis possible at different levels, which suited the suggested force-based approach well. The data structuration technique covers the input of data as well as the reduction, coding, handling, storing and export of it, and a usable data set is obtained from an easily available data source through all these stages of the technique. Therein lies the accomplishment of it.

The initial development of the data structuration technique was reported in an earlier work (Dahlin, 2005), but the development has continued in this thesis through the addition of more data as well as adaptation and further development to enable a directed analysis of the characters of a business network change sequence. Export functions, together with all the preparatory functions calculating different measures preceding the export, have been added to the software tool in mabIT, i.e. the used implementation of the data structuration technique. The development has thus continued, and the usability of mabIT has been put to the test, with quite successful results, and the data structuration technique is thereby considered to be one of the contributions of this work.

Business networks and business network change are highly abstract phenomena, and are thus not possible to directly study empirically. The force-based approach to business network change, however, includes the notion of ‘events’ as the empirical phenomenon giving rise to forces that affect the business network. So, whereas the forces altering the business network cannot be studied, the events can, and they

offer a way to get to the forces and the business network dynamics. The business network change sequence captured with mabIT is thus in the form of events, which are assumed to give rise to forces in a business network. The studied business network is, in turn, a conceptual creation and cannot be captured easily. What gets to represent the studied business network in mabIT is, therefore, actors and different forms of relations, but whether these relations are considered to be business relationships, as defined in Chapter 2, is however up to the criteria set by the researcher. The pursued approach to business network change explicitly focuses the changes, and thereby reduces the importance of obtaining information about the enduring business network structure. However, information about parts of the business network surrounding the captured events is needed to assess the contextual extension of the studied business network change sequence, and mabIT therefore contains information on events and some of their contexts in the form of relations of the actors directly involved in the events.

Given the assumed difficulty of studying business networks, it is not easy to collect data representing business network change, but the data structuration technique offers a way to get a quite large amount of usable data. This is done by relying on a data source easily available in large quantities, namely news items, and the contribution lies in how order is brought to the large, and for this cause unarranged, amount of information held in the news items. The use of news items as a data source gives access to information that was recorded adjacent to the actual time of the merger, acquisition or bankruptcy. This gives a temporal integrity, which is very important in retrospective studies, and this kind of data source can potentially provide a different picture than, for example, retrospective interviews. The information in the news items has not been collected to fulfil the objective of this study, but the imperfections of each news item is compensated for with the large amount of available input data. Details are consequently sacrificed in order to obtain a set of data containing a large number of observations; a shallow picture of a wider phenomenon is preferred to a deep understanding of a narrow situation.

The data structuration technique can be applied to many different kinds of sources besides news items. Similar sources, such as press releases, annual reports or corporate documents could well be used, but even interview data could be structured in a similar way. All these sources have their own strengths and weaknesses, and benefits in one aspect often means sacrifices in another. Secondary sources of this kind have previously been used in different types of research, but the data structuration technique distinguishes from the traditional use mainly in two aspects. First of all, it is not primarily intended for studies of the source itself, for example the business press, but rather uses the source to extract information about the studied phenomenon, in this case a business network change sequence. The second distinction is the aim to enable wider studies, as this type of sources are most easily used for narrower, actor-focused, case studies when the studied phenomenon is something other than the source itself.

8.3.1 Limitations of the Data Structuration Technique

As with all methods, the data structuration technique has a number of shortcomings, and some were discussed in Chapter 5. One issue already discussed is the reliance on potentially biased information in news items, but the information extracted from news items in this study is relatively rough, and nuances or values in the texts are not focused, which reduces the subjectivity of the obtained information. The substance of the obtained data is also increased from the mentioning of some events in several news items, which thereby complement and support each other. It can also be noticed that some companies are mentioned more frequently than others, perhaps because of differences in importance or purchase of advertisements, which naturally is reflected in the presence in the data set.

If leaving the content of the news items, it is also relevant to consider the carefulness of the coding and handling of the data. The choice of newspapers is naturally important in order to get the desired amount and quality of data, but except for a general assessment of the credibility and potential amount of relevant news items, the choice of newspapers has not been considered a great issue. The used search terms are likewise crucial for obtaining a relevant set of news items, and choosing the search terms is a trade-off between avoiding exclusion of relevant articles and reducing the large amount of available news items to a manageable number. Thereafter, the found news items are to be coded, and as the variables of the coding are decided by the coding scheme, the coding is believed to be quite consistent, not least since much of the coding is done through guides as shown earlier. The coding of the data is closely related to the interpretation of the news items, which can be a source of inconsistency, but identifying events, actors and relations involves a relatively low degree of interpretation.

The used search terms yields a preference for news items primarily describing mergers, acquisitions and bankruptcies, whereas the relations are bonus information. The data on relations is thus probably less substantiated than the event data, and that is for example part of the reason for the large share of the registered relations where the indications of time are missing. In the suggested force-based approach to business network change, the forces form a coherent sequence through temporal and structural linkages and the time aspect is thus of great importance, but the many omissions of time indications had to be handled in the analysis by simply disregarding the temporal dimension of the relations. Deciding when a relation starts and ends is not very easy, particularly not when relying on information from news items, and the lack of time indications is a considerable shortcoming of this study. So, a challenge for future uses of similar techniques for studies of business networks is thus to improve the temporal information concerning the relations.

On the other hand, one of the advantageous features offered by using news items to identify relations between companies is the duality of the information. When

using information that originates from one actor, all the relations that will be known of are described from the perspective of that actor, which gives an egocentric and one-sided picture. The news items can describe relations from both sides, which on one hand provides increased substance of the data, but can also enable an extended data set. For example, the relation between actor A and actor B may perhaps be of great importance to actor A, whereas actor B has other relations that it considers more important. Asking B for its five most important relations would thus not include the A-B relation, whereas asking actor A would. The multi-sided information contained in the news items can thus increase the inclusion of various types of relations, and this aspect could perhaps be described as an asymmetry in the companies' network pictures (c.f. Ford & Redwood, 2005; Henneberg, Mouzas & Naudé, 2006). This also points at a relevance increasing factor; the relations mentioned in a news item are most likely those considered the most important for some reason, which thus implies that although the captured information about the business network structure is limited, what is captured should indeed be quite relevant.

8.3.2 Future Opportunities for mabIT

As this is the first use of mabIT, there are naturally many lessons for future implementations of similar data structuration techniques or further use of the current data. The demanding collection and coding of the data is one aspect which could be developed further. Different sources and search terms could be evaluated to find the most relevant information and it is also possible to use other, more sophisticated, methods for data reduction, for instance by setting a relevance score for each news item, assessed through certain combinations of words. An automated data reduction, with 'intelligent' learning through manual corrections could thereby be achieved, and a similar procedure could perhaps be applied to the coding of the data. This would enable a large data set to be created rather easily, but it increases the importance of the precision of the coding scheme.

Some adaptations can be made to the coding scheme used in the current study to enable further use of the obtained data. Besides the described difficulties in obtaining good time indications for the relations, the product type of the actors showed problematic to distinguish in some cases, not just because of indistinctness, but from the variability of what was assumed a static variable. An extreme example is the internet-consultancy firm Adcore, of which a part was transformed into a real-estate company named Klöver in 2002. This shows one example of the benefits from allowing the actor's characteristics to be changeable over time, which thus is an issue to consider if a high temporal consistency is wanted.

The possibility for flexible analysis was one of the objectives behind the design of mabIT. The coding of inter-related meta-data and the use of a relational database enabled a creative use of the data and, furthermore, mabIT can be modified both concerning the database structure and the available functions, for instance regarding data exports, so the possibilities for analysis are not restricted by the

software application. Only parts of the collected data have been used for the analysis in this thesis, and further analysis could thus be made. The identification of the transforming company Adcore-Klövern illustrates the potential for identifying interesting cases from the captured data. During the extensive read-through of the news items, a number of interesting cases have been identified, based on, for example, some specific events or a frequent acquiring. Interesting cases can also be identified in the coded data set, through analysis of the various variables, as has been shown in some examples in Chapter 7. For example, the top 10 lists of the number of involvements and acquisitions made, found in Table 7.6, shows one way to find interesting companies to study further.

8.4 Mergers, Acquisitions and Bankruptcies as Linked Events

Besides the development of a conceptual approach to business network change, and a technique to enable empirical studies of it, this thesis has also made use of the approach and technique, and the result is a description of a sequence of mergers, acquisitions and bankruptcies involving Swedish IT-companies during a ten year period. In this study, mergers, acquisitions and bankruptcies are seen as events giving rise to forces that cause change of the business network. It is thus a longitudinal study of radical change of business networks, which have been wanted by some scholars (cf. Knoblen, Oerlemans & Rutten, 2006).

However, not only can mergers, acquisitions and bankruptcies be used in order to get to business network change; the study also gives an interesting understanding of mergers, acquisitions and bankruptcies as contextually inter-linked phenomena. The common confined view of these events, only considering the companies directly involved, contributes to the tendency to focus on internal issues in literature on these kind of events. Seeing mergers, acquisitions and bankruptcies in a business network perspective sets the events in a context, and acknowledges a wider inclusion of involved companies, which could be beneficial for understanding the cause and effects of this kind of events. An analysis of the linkages between the studied events was made to look further into the assumed coherence of the studied situation. In that analysis, a quite high degree of inter-linkages was found also when only the direct involvements were included, which makes analyses of mergers, acquisitions and bankruptcies as chains of events quite relevant. The linkage analysis however found that adding various types of relations to the linkage analysis substantially increases the linkages, which is a strong indicator of the significant contribution a business network perspective can give to the understanding of such events. The linkage analysis indicates that these type of events can have quite far-reaching effects, potentially affecting a large number of actors. Continuing the linkage analysis, the used data set was found to be quite well intra-linked, which supports the study's desire to see the captured events as a sequence.

The use of the data structuration technique has resulted in a large amount of information about Swedish IT-companies, their relations and mergers, acquisitions and bankruptcies among them. The analysis made in this thesis has only used a minor part of the data, and much more could be done to further understand the mergers, acquisitions and bankruptcies involving Swedish IT-companies. However, what have been presented from the empirical study concerning the turbulent period among the Swedish IT-companies is considered a contribution of this thesis. As has been pointed out earlier, the aim of the study has never been to cover the entire IT-sector, and all the mergers, acquisitions and bankruptcies that took place during the studied period, so the obtained data should not be taken as a full account for the studied situation. The comparison with the number of bankruptcies registered in Statistics Sweden, as presented in section 6.3.1, indicated a coverage of below 6%, which without a doubt is low. A similar comparison is unfortunately not possible for the mergers and acquisitions, but as the number of registered mergers and acquisitions is over six times the number of registered bankruptcies, which is a notably high proportion, the coverage of mergers and acquisitions is believed to be better. Regardless of the representativeness, the study shows that many mergers and acquisitions involving Swedish IT-companies took place during 1994-2003. In the analysis of the mergers, acquisitions and bankruptcies as a business network change sequence, using the suggested force-based approach and the dimensions describing business network change, the character of the studied situation was found to have a high intensity and a wide extension. Many events, of rather radical type, took place. They were quite spread over the studied period, but a distinct peak could be identified in 1999-2002. Furthermore, the events were found to be quite widely spread in individual actors as well as structural positions and product type categories. This was thus undoubtedly a situation of revolving dynamics, and referring to it as “turbulence” is considered well-founded.

8.4.1 Furthering the Study

The approach used can both handle the mergers, acquisitions and bankruptcies in aggregate, similar to merger movements and waves, and as separate events, similar to actor or event-focused case studies. It is thus possible both to show variations in the aggregated numbers and characteristics of specific events. This enables the study of mergers, acquisitions and bankruptcies involving Swedish IT-companies to be furthered in many different ways.

Using the current set of data, aggregate analysis could for example be made with a further interest in trends in the occurrence and types of events, which potentially also could be used for predictive purposes. There is also a possibility for the analysis to include more variables describing the individual actors and events, and a few such opportunities are actually possible with the current data set. As has been described earlier, the coding scheme includes the nationality of the actors and various aspects reflecting the size of the actors. These dimensions could thus be incorporated into the analysis, both within the force-based approach and with other

ambitions. As the nationalities were complemented in the data refinement efforts, the data is quite complete in that aspect and could for example be used in the analysis of contextual extension. A brief analysis indicates a quite uniform distribution over the product types for the three main nations, or groups of nations, Sweden, Europe and North America, which could be a sign of a plausible inter-variable distribution worth analyzing. The size variable is, on the other hand, not as complete, and more data must thus be added in order to enable analysis of that aspect. It could, however, be interesting to analyze the size of the companies in relation to the involvements in events.

As is shown in the brief description of the number of relations per actor, found in Table 6.7, some actors are part of a large number of registered relations. This is interesting to consider as a kind of 'name dropping', in the sense that many companies want to be associated with certain companies. The most popular companies, based on the news items' frequency of mentioning them as the part of a relation, are primarily very large and well known companies such as Telia, Ericsson, IBM, WM-data and Volvo, which are probably mentioned to add to the trustworthiness of the other company. This tendency of mentioning certain companies naturally makes the data biased, but it can also be seen as an interesting issue worth looking further into. As has been pointed out earlier, the suggested indicators to describe the characters of a business network change sequence does not consider the details of the relations. The data obtained in the current study contains quite a number of partnership relations, often formed around the development of products or technology, and such inter-organizational cooperation can surely be relevant to look further into, not least in the fast-moving IT-sector.

An IT-related business network was earlier suggested to be somewhat special, due to the high complexity of IT-products and the dependence that causes. The suggested characters of the IT-related business network has, however, not been included in the scope of this study, but could be a relevant issue to look further into. Continuing the focus on technology, the FTC's frequently used typology of M&As, as was presented earlier, is based on the technologies of the acquiring and target firms, and similar analysis could also be done with the data set used in this study. It could even be done with a wider inclusion of actors in the events, thus not only considering the technology of the acquiring and target companies, but also of the companies involved through relations to the directly involved companies. Continuing the acquisition strategy topic, it would also be interesting to investigate whether the mergers and acquisitions are preceded by the business network structure, i.e. the consolidating actors are related to each other prior to the consolidation. It would also be interesting to study whether other types of forces arise before the forces caused by mergers, acquisitions and bankruptcies, i.e. if the radical forces are preceded by adjustive forces, which would imply a kind of expectedness of the radical forces. An awareness of this kind could be assumed to reduce the effects of the radical forces on the business network. However, such an analysis would require completion of the temporal data regarding the relations as

well as addition of other types of events, and is not possible to perform using the current data set. Looking into the possibility to predict events based on the current business network structure is thus a challenge for future studies.

8.4.2 Actor-Specific Analysis

The analysis presented in this study has mainly been on an aggregated level, taking interest in the change sequence made up of mergers, acquisitions and bankruptcies within the Swedish IT-related business network. However, from a managerial point of view, it is evidently also relevant to perform actor-specific analysis, focused on the company of interest. This would thus be more of a narrow case study approach, but can certainly use the force-based approach as well as the data structuration technique. The management's knowledge of the company's situation is of great importance (cf. Cummings, 1983; Cyert & March, 1963; Johanson & Vahlne, 1977; Penrose, 1959), and the technique used in this study can offer a way to get a greater understanding of complex situations.

The interest behind an actor-specific analysis is consequently not the larger change sequence in a situation, but rather a specific actor's role in it. For example, the involvements of the studied actor could be analysed in terms of the number and roles, which could give an understanding of the actor's involvement in the change, but could also enable comparisons between actors. When continuing this approach, it would be interesting to relate the involvement profile of the studied actor with the involvement profiles of those actors that are related to it. The role of an individual actor could thereby not only be assessed in relation to the entire set of actors included in the study, but also more specifically relative to the immediate context of the actor. Likewise the involvements could be distinguished over time, and also from that aspect could comparisons be made with other sets of actors.

With another focus, an understanding of the actor's media presence could be obtained from their occurrence in news items, including how the actor is portrayed and which other actors it is associated with. This gives an understanding not only of the actor's relationship to the media, and its external communication through, for example, press-releases, but can also be a key to managing the representation of the actor and how other perceive it. On the other hand, as a user of news items, information about counterparts and their doings that hardly could be obtained as easily in other ways can be found. This kind of interest does, however, set a more explicit focus on the news items per se.

8.5 Managerial Importance

Although the primary focus of this thesis has been theoretical rather than practical, there are also some implications for the management of business from the contributions of this work. Since companies are not isolated units, a major task for management is to navigate through, and relate to, the context of the firm. From such a view arise two main contributions of this thesis to management: one

regarding the understanding of a company in its surroundings and one regarding managerial actions, including the consequences of such actions.

Understanding markets and industries has been a topic in various strands of research, and different perspectives can be applied to companies and their context. The different perspectives imply large variations in what is considered important and what is ascribed the role of management, but the management's knowledge of its situation is of great importance irrespective of the viewpoint. This includes gaining an understanding of the current situation, plausible developments and the company's role in the situation. Whereas the business network perspective offers a way to understand a company in its context, the data structuration technique offers a way to collect information to base the understanding on. This thesis has thus provided managers with the embryo of a tool to analyze their context, and if the analysis is made with a greater focus on identifying trends, plausible future developments could perhaps also be identified. An example of such a description has also been given for those companies involved in the Swedish IT-related business network. The analyses made have not been focused on a specific actor, but there are great possibilities for making actor-specific analyses with the suggested approach and the obtained data. By following and analyzing a specific company throughout the data, an understanding of that company's role could be obtained. This includes a potential of revealing interesting relations, and how the company is described by its counterparts, but also its involvement in the ongoing changes could be analyzed.

A central part of management and strategy is the actions that are taken. In the approach pursued in this thesis, business network change is seen as a sequence of forces, which arise from various events. The forces do thus not appear from nowhere, and at least the endogenous types of events are caused by actions taken by companies within the studied business network. However, whereas the events can be seen as voluntary actions made by the actors, the opportunities for these actions are given by the business network and may vary substantially depending on the character of the setting. What is relevant to acknowledge is, however, that the forces caused by individual firms' actions are likely to cause business network change, and the role of management is thus not only to act, but also to consider the wider effects of the actions as well as the effects from other companies' actions. These intertwined connections between a company's own actions, other companies' actions and the business network are well captured through the empirical study in this thesis.

The interactions between different forces are incorporated in the very idea of seeing the overall change as a resulting sequence of the occurring forces. The inclusion must naturally be delimited, and there are naturally many more forces than those caused by the captured mergers, acquisitions and bankruptcies. Furthermore, if thinking even wider, the trajectory of the studied Swedish IT-related business network is interacting with the trajectories of adjacent or overlapping business networks, for example of the Swedish telecom-related

business network. As has been stated earlier, the delimitation of business networks is a troublesome issue, but for management, the relevant inclusion could originate from their own company, based on the actors and relations that are important to one's business, and an actor-specific analysis is probably the most suitable when having such an interest. In short, the implication of this thesis' reasoning is that the actions of an individual actor are just a small part of the larger sequence of inter- and counteracting forces.

8.6 Concluding the Accomplishments

As was indicated by the introduction to this chapter, three main accomplishments are believed to be the result of this thesis. The force-based approach to business network change is probably most interesting to business network researchers, as it enables a conceptualization and description of business network change. The data structuration technique could on the other hand be of use in various fields of research, and perhaps also in practice, and its main feature is its ability to bring order to a large input of unarranged data. The study of Swedish IT-companies can hopefully be of interest to those interested in the IT-sector or mergers, acquisitions and bankruptcies, but has also been an important empirical application of the force-based approach and data structuration technique, from which much can be learnt. Besides the accomplishments, this chapter has also discussed a number of shortcomings with each of the three main parts, and future challenges for taking them further.

Although this thesis primarily has had an ambition of contributing to the research on business networks, it should also be of relevance to its field, i.e. business, and more precisely industrial marketing and management. Seeing the company, and its actions, in a context of other companies, and their actions, is a potential success factor that is easily disregarded because of the complexity of such a view. This work has resulted in a description of companies and their actions as inter-linked phenomena, and that is this thesis' contribution to the field of market focused management.

References

- Achrol, R. S. (1991). Evolution of the Marketing Organization: New Forms for Turbulent Environments. *Journal of Marketing*, 55(4), pp. 77-94.
- Adelaja, A., Nayga, R. & Farooq, Z. (1999). Predicting mergers and acquisitions in the food industry. *Agribusiness*, 15(1), pp. 1-23.
- Affärsdata. (2007-07-04). from <http://www.affarsdata.se/info/show.php?page=kallor>
- Aguilera, R. V. & Dencker, J. C. (2004). The role of human resource management in cross-border mergers and acquisitions. *International Journal of Human Resource Management*, 15(8), pp. 1355-1371.
- Ahuja, G. & Katila, R. (2001). Technological acquisitions and the innovation performance of acquiring firms: A longitudinal study. *Strategic Management Journal*, 22(3), pp. 197-220.
- Alajoutsjärvi, K., Möller, K. & Tähtinen, J. (2000). Beautiful exit: how to leave your business partner. *European Journal of Marketing*, 34(11), pp. 1270-1290.
- Alonso, M. & Finn, E. J. (1967). *Fundamental university physics*. Reading, Massachusetts: Addison-Wesley
- Amesse, F., Latour, R., Rebolledo, C. & Seguin-Dulude, L. (2004). The telecommunications equipment industry in the 1990s: from alliances to mergers and acquisitions. *Technovation*, 24(11), pp. 885-897.
- Amihud, Y. & Lev, B. (1981). Risk Reduction as a Managerial Motive for Conglomerate Mergers. *The Bell Journal of Economics*, 12(2), pp. 605-617.
- Anderson, B. S., Butts, C. & Carley, K. (1999). The Interaction of Size and Density with Graph-level Indices. *Social Networks*, 21(3), pp. 239-267.
- Anderson, E. & Weitz, B. (1992). The Use of Pledges to Build and Sustain Commitment in Distribution Channels. *Journal of Marketing Research*, 29(1), pp. 18-34.
- Anderson, E. W., Fornell, C. & Rust, R. T. (1997). Customer Satisfaction, Productivity, and Profitability: Differences between Goods and Services. *Marketing Science*, 16(2), pp. 129-145.
- Anderson, H. (1994). *Ett industriföretags omvandling: en studie av Hägglunds förändringsprocess 1922-1981 med bas i företagens produkter, relationer och resurser*. Doctoral dissertation, EFI, Stockholm School of Economics, Stockholm.
- Anderson, H., Havila, V., Andersen, P. & Halinen, A. (1998). Position and Role - Conceptualizing dynamics in business networks. *Scandinavian Journal of Management*, 14(3), pp. 167-186.
- Anderson, H., Havila, V. & Holtström, J. (2003). *Are Customers and Suppliers participants of a Merger or an Acquisition? - A literature review*. Paper presented at the 19th Annual IMP Conference, Lugano, Switzerland.
- Anderson, H., Havila, V. & Salmi, A. (2001). Can You Buy a Business Relationship? On The Importance of Customer and Supplier Relationships in Acquisitions. *Industrial Marketing Management*, 30(7), pp. 575-586.
- Anderson, J. C., Håkansson, H. & Johanson, J. (1994). Dyadic Business Relationships within a Business Network Context. *Journal of Marketing*, 58(4), pp. 1-15.

- Andersson, P. & Mölleryd, B. (1999). Channel Network Change and Behavioral Consequences of Relationship Connectedness - The Strategic Planning Imperative. *Journal of Business Research*, 46(3), pp. 291-301.
- Andersson, U., Blankenburg Holm, D. & Johanson, M. (2005). Opportunities, Relational Embeddedness and Network Structure. In P. N. Ghauri, A. Hadjikhani & J. Johanson (Eds.), *Managing opportunity development in business networks* (pp. 27-48). Basingstoke: Palgrave Macmillan.
- Andersson, U., Johanson, J. & Vahlne, J.-E. (1997). Organic Acquisitions in the Internationalization Process of the Business Firm. *Management International Review*, 37(2), pp. 67-84.
- Ansoff, H. I. (1965). *Corporate strategy : an analytic approach to business policy for growth and expansion*. New York: McGraw-Hill
- Ansoff, H. I. (1971). *Acquisition behavior of U.S. manufacturing firms, 1946-1965*. Nashville,: Vanderbilt University Press
- Appelbaum, S. H., Gandell, J., Shapiro, B. T., Belisle, P. & Hoeven, E. (2000). Anatomy of a merger: behavior of organizational factors and processes throughout the pre- during- post- stages (part 2). *Management Decision*, 38(10), pp. 674-684.
- Appelbaum, S. H., Gandell, J., Yortis, H., Proper, S. & Jobin, F. (2000). Anatomy of a merger: behavior of organizational factors and processes throughout the pre- during- post-stages (part 1). *Management Decision*, 38(9), pp. 649-662.
- Arbel, A. & Woods, R. H. (1988). Shark Repellent: Anti-Takeover Measures For The Hospitality Industry. *Cornell Hotel and Restaurant Administration Quarterly*, 29(3), pp. 28-39.
- Auster, E. R. & Sirower, M. L. (2002). The dynamics of merger and acquisition waves: A three-stage conceptual framework with implications for practice. *The Journal of Applied Behavioral Science*, 38(2), pp. 216-244.
- Avison, D. E. & Fitzgerald, G. (1995). *Information systems development : methodologies, techniques and tools* (2. ed.). London: McGraw-Hill
- Axelsson, B. & Easton, G. (Eds.). (1992). *Industrial Networks: A New View of Reality*. London: Routledge.
- Back, B., Laitinen, T., Sere, K. & Wezel, M. V. (1996). *Choosing Bankruptcy Predictors Using Discriminant Analysis, Logit Analysis, and Genetic Algorithms*. Turku, Finland: Turku Centre for Computer Science, Technical Report No 40.
- Balaban, P. M., Korshunova, T. A. & Bravarenko, N. I. (2004). Postsynaptic calcium contributes to reinforcement in a three-neuron network exhibiting associative plasticity. *European Journal of Neuroscience*, 19(2), pp. 227-233.
- Baraldi, E. (2003). *When information technology faces resource interaction : using IT tools to handle products at IKEA and Edsbyn*. Doctoral thesis no 105, Department of Business Studies, Uppsala university, Uppsala.
- Baraldi, E. & Strömsten, T. (2005). Network Opportunities and Obstacles in Mergers and Acquisitions: The Role of Resource Embeddedness. In P. N. Ghauri, A. Hadjikhani & J. Johanson (Eds.), *Managing opportunity development in business networks* (pp. 202-218). Basingstoke: Palgrave Macmillan.
- Barkema, H. G. & Vermeulen, F. (1998). International Expansion through Start up or Acquisition: A Learning Perspective. *Academy of Management Journal*, 41(1), pp. 7-26.
- Barnard, C. I. (1938). *The functions of the executive*. Cambridge, Mass.: Harvard University Press
- Barnes, J. A. (1954). Class and Committees in a Norwegian Island Parish. *Human Relations*, 7(1), pp. 39-58.
- Batagelj, V. (2003). Analysis of large networks - Islands, *Dagstuhl seminar 03361: Algorithmic Aspects of Large and Complex Networks, August 31 - September 5 2003*, <http://vlado.fmf.uni-lj.si/pub/networks/doc/dagstuhl/large.pdf>
- Batagelj, V. & Mrvar, A. (2003). Pajek - Analysis and Visualization of Large Networks. In M. Jünger & P. Mutzel (Eds.), *Graph Drawing Software* (pp. 77-103). Berlin: Springer.

- Batagelj, V. & Mrvar, A. (2006). Analysis of Large Networks with Pajek, *Pajek workshop at XXVI Sunbelt Conference, Vancouver, BC, Canada, 25-30 April 2006*, <http://vlado.fmf.uni-lj.si/pub/networks/Doc/Sunbelt/sunbeltXXVI.pdf>
- Batagelj, V. & Mrvar, A. (2007). Pajek website: <http://vlado.fmf.uni-lj.si/pub/networks/pajek/>.
- Batagelj, V. & Zaveršnik, M. (2004). Islands, *COSIN Meeting at the University of Karlsruhe, November 8th and 9th 2004*, <http://vlado.fmf.uni-lj.si/pub/networks/doc/mix/islands.pdf>
- Batonda, G. & Perry, C. (2003). Approaches to relationship development processes in inter-firm networks. *European Journal of Marketing*, 37(10), pp. 1457-1484.
- Baumol, W. J. (1982). Contestable Markets: An Uprising in the Theory of Industry Structure. *The American Economic Review*, 72(1), pp. 1-15.
- Beckman, C. M. & Haunschild, P. R. (2002). Network learning: The effects of partners' heterogeneity of experience on corporate acquisitions. *Administrative Science Quarterly*, 47(1), pp. 92-124.
- Belcher, T. & Nail, L. (2000). Integration problems and turnaround strategies in a cross-border merger - A clinical examination of the Pharmacia-Upjohn merger. *International Review of Financial Analysis*, 9(2), pp. 219-234.
- Benassi, M. (1995). Governance factors in a network process approach. *Scandinavian Journal of Management*, 11(3), pp. 269-281.
- Bengtson, A. (2003). *Framing technological development in a concrete context : the use of wood in the Swedish construction industry*. Doctoral thesis, Department of Business Studies Uppsala University, Uppsala.
- Bengtsson, M. & Kock, S. (1999). Cooperation and competition in relationships between competitors in business networks. *The Journal of Business & Industrial Marketing*, 14(3), pp. 178-194.
- Berger, A. N., Bonime, S. D., Goldberg, L. G. & White, L. J. (2004). The Dynamics of Market Entry: The Effects of Mergers and Acquisitions on Entry in the Banking Industry. *The Journal of Business*, 77(4), pp. 797-834.
- Berggren, C. (2003). Mergers, MNES and innovation - the need for new research approaches. *Scandinavian Journal of Management*, 19(2), pp. 173-191.
- Bjerstedt, Å. (1963). *Sociometrisk metod (Eng. Sociometric methods)*. Stockholm: Almqvist & Wiksell
- Blankenburg Holm, D. (1996a). *Business network connections and international business relationships*. Doctoral Thesis No. 65, Department of Business Studies, University Distributor, Uppsala University, Uppsala.
- Blankenburg Holm, D. (1996b). A network approach to foreign market entry. In K. Möller & D. T. Wilson (Eds.), *Business Marketing: An Interaction and Network Perspective* (pp. 375-504). Boston: Kluwer Academic Publishers.
- Blankenburg Holm, D. & Johanson, J. (1997). Business Networks Connections and the Atmosphere of International Business Relationships. In I. Björkman & M. Forsgren (Eds.), *The Nature of the International Firm: Nordic Contributions to International Business Research*. Copenhagen: Handelshøjskolens forlag.
- Bloomfield, L. A. (1997). *How things work : the physics of everyday life*. New York: Wiley
- Bocconcelli, R., Snehota, I. & Tunisini, A. (2006). Network Relationships and Corporate Acquisitions Outcomes. *The IMP Journal*, 1(2), pp. 4-28.
- Boddewyn, J. J. (1988). Political Aspects Of MNE Theory. *Journal of International Business Studies*, 19(3), pp. 341-363.
- Bonfield, P. (1993). Implications of developments in electronic trading: A cross-industry view. *Logistics Information Management*, 6(5), pp. 16-20.
- Boone, T. & Ganeshan, R. (2002). *New directions in supply-chain management : technology, strategy, and implementation*. New York: AMACOM

- Bower, J. L. (2001). Not all M&As are alike - and that matters. *Harvard Business Review*, 79(3), pp. 92-101.
- Breiger, R. L. (2003). Emergent Themes in Social Network Analysis: Results, Challenges, Opportunities. In R. L. Breiger (Ed.), *Dynamic Social Network Modeling and Analysis: Workshop Summary and Papers* (pp. 19-35). Washington, DC, USA: National Academies Press.
- Britannica Concise Encyclopedia. Online edition, from <http://search.eb.com/>
- Broadbudd, J. A. J. (1998). The bank merger wave: Causes and consequences. *Economic Quarterly - Federal Reserve Bank of Richmond*, 84(3), p. 1.
- Brockwell, P. J. & Davis, R. A. (2002). *Introduction to time series and forecasting* (2. ed.). New York: Springer
- Brown, S. W., Fisk, R. P. & Bitner, M. J. (1994). The Development and Emergence of Services Marketing Thought. *International Journal of Service Industry Management*, 5(1), pp. 21-48.
- Bryman, A. & Bell, E. (2003). *Business research methods*. Oxford: Oxford University Press
- Brynjolfsson, E. & Hitt, L. M. (2000). Beyond computation: Information technology, organizational transformation and business performance. *Journal of Economic Perspectives*, 14(4), pp. 23-48.
- Buchanan, M. (2002). *Nexus : small worlds and the groundbreaking science of networks*. New York: Norton & Company
- Buckley, P. J. & Casson, M. C. (1998). Analyzing Foreign Market Entry Strategies: Extending the Internalization Approach. *Journal of International Business Studies*, 29(3), pp. 539-561.
- Bulow, J. I. & Shoven, J. B. (1978). The Bankruptcy Decision. *Bell Journal of Economics*, 9(2), pp. 437-437.
- Burt, R. S. (1992). *Structural holes : the social structure of competition*. Cambridge, Mass.: Harvard Univ. Press
- Bushnell, J. A. (1961). *Australian company mergers 1946-1959*. Melbourne: Melbourne University Press, Cambridge University Press
- Bångens, L. & Araujo, L. (2002). The structures and processes of learning - A case study. *Journal of Business Research*, 55(7), pp. 571-581.
- Cairncross, F. (2001). *The death of distance : how the communications revolution is changing our lives*. Boston: Harvard Business School Press
- Calantone, R., Garcia, R. & Droge, C. (2003). The effects of environmental turbulence on new product development strategy planning. *The Journal of Product Innovation Management*, 20(2), pp. 90-103.
- Calegari, M. & Turetsky, H. (2006). Selling to Escape Compliance Costs. *Mergers and Acquisitions*, 41(9), pp. 54-58.
- Cappelli, P. (2006). Making M&As Work. *Human Resource Executive Online*, October 16, 2006.
- Capron, L., Dussauge, P. & Mitchell, W. (1998). Resource redeployment following horizontal acquisitions in Europe and North America, 1988-1992. *Strategic Management Journal*, 19(7), pp. 631-661.
- Carlsson, B. & Paulsson, T. (2006). Information and Communication Technology (ICT) Sector Developments in European and United States Metro Areas. In C. Karlsson, B. Johansson & R. R. Stough (Eds.), *Entrepreneurship and dynamics in the knowledge economy*. London ; New York, NY: Routledge.
- Carr, D. (2000). The Trials of Industry Mergers & Acquisitions. *Canadian Underwriter*, 67(1), pp. 20-23.
- Carrington, P. J., Scott, J. & Wasserman, S. (2005). *Models and methods in social network analysis*. New York: Cambridge University Press
- Cecil, B. P., Green, M. B. & McNaughton, R. B. (1996). Patterns of Strategic Alliances among Information Technology Firms in the United States. *Geografiska Annaler. Series B, Human Geography*, 78(3), pp. 129-146.

- Chaffee, E. E. (1985). Three Models of Strategy. *Academy of Management. The Academy of Management Review*, 10(1), pp. 89-99.
- Chandler, A. D. & Cortada, J. W. (2000). *A nation transformed by information: how information has shaped the United States from Colonial times to the present*. Oxford, England; New York: Oxford University Press
- Chase, R. (1996). The mall is my factory: Reflections of a service junkie. *Production and Operations Management*, 5(4), pp. 298-308.
- Chatterjee, S. (1992). Sources of Value in Takeovers: Synergy or Restructuring - Implications for Target and Bidder Firms. *Strategic Management Journal*, 13(4), pp. 267-287.
- Chatterjee, S. & Lubatkin, M. (1990). Corporate Mergers, Stockholder Diversification, and Changes in Systematic Risk. *Strategic Management Journal*, 11(4), pp. 255-269.
- Chatterjee, S., Lubatkin, M. H., Schweiger, D. M. & Weber, Y. (1992). Cultural-Differences and Shareholder Value in Related Mergers: Linking Equity and Human-Capital. *Strategic Management Journal*, 13(5), pp. 319-334.
- Cheng, Y.-M. (2006). Determinants of FDI Mode Choice: Acquisition, Brownfield, and Greenfield Entry in Foreign Markets. *Canadian Journal of Administrative Sciences*, 23(3), pp. 202-220.
- Chetty, S. & Eriksson, K. (2002). Mutual commitment and experiential knowledge in mature international business relationship. *International Business Review*, 11(3), pp. 305-324.
- Choi, Y. K. (2001). Management turnover and executive compensation in synergistic takeovers. *The Quarterly Review of Economics and Finance*, 41(2), pp. 223-238.
- Claessens, S., Djankov, S. & Mody, A. (2001). *Resolution of financial distress : an international perspective on the design of bankruptcy laws*. Washington, D.C.: World Bank
- Collins, S. L. & Glenn, S. M. (1991). Importance of Spatial and Temporal Dynamics in Species Regional Abundance and Distribution. *Ecology*, 72(2), pp. 654-664.
- Computer Sweden. (1999). Det finns ingen IT-bubbla! (Eng. There is no IT-bubble!). *Computer Sweden*. 1999-11-05.
- Conant, L., Jr. (1901). Industrial Consolidations in the United States. *Publications of the American Statistical Association*, 7(53), pp. 1-20.
- Cook, K. S. (1982). Network structures from an exchange perspective. In P. V. Marsden & N. Lin (Eds.), *Social structure and network analysis* (pp. 177-199). Beverly Hills, Calif.: Sage.
- Cook, K. S. & Emerson, R. M. (1984). Exchange Networks and the Analysis of Complex Organizations. *Research in the Sociology of Organizations*, 3, pp. 1-30.
- Costenbader, E. & Valente, T. W. (2003). The stability of centrality measures when networks are sampled. *Social Networks*, 25(4), pp. 283-307.
- Coviello, N. E. (2005). Integrating qualitative and quantitative techniques in network analysis. *Qualitative Market Research: An International Journal*, 8(1), pp. 39-60.
- Cummings, L. L. (1983). The Logics of Management. *Academy of Management. The Academy of Management Review*, 8(4), pp. 532-539.
- Cunningham, C., Song, I.-Y. & Chen, P. P. (2006). Data Warehouse Design to Support Customer Relationship Management Analyses. *Journal of Database Management*, 17(2), pp. 62-84.
- Cunningham, M. (1995). Competitive Strategies and Organizational Networks in New-Technology Markets. In K. Möller & D. T. Wilson (Eds.), *Business marketing : an interaction and network perspective* (pp. 321-349). Boston ; London: Kluwer Academic Publishers.
- Cyert, R. M. & March, J. G. (1963). *A behavioral theory of the firm*. Englewood Cliffs, N.J.,: Prentice-Hall
- Dagens Industri. (1998). Ny boom för IT-aktier. Största och hetaste branschen på börsen. (Eng. New boom for IT-shares. The largest and hottest industry on the stock market.). *Dagens Industri*. 1998-05-11.

- Dagens Nyheter. (1999). Aktiehysteri gör inte Internet till bubbla (*Eng. Stockmarket hysteria does not make the Internet a bubble*). *Dagens Nyheter*. 1999-11-21.
- Dahlin, P. (2005). *Structural Change of Business Networks - Developing a Structuration Technique*. Licentiate thesis No. 49, School of Business, Mälardalen University, Västerås, Sweden.
- Dahlin, P. (2007a) *Applying SNA to Business Networks - Opportunities and Obstacles*. Paper accepted to the International Conference on Social Network Analysis (SNA), 14-16 February 2007, Indian Statistical Institute, Kolkata/Calcutta, India
- Dahlin, P. (2007b) *Joining the Forces of SNA and the European Business Network Perspective*. Paper presented at Sunbelt XXVII (the International Sunbelt Social Network Conference) / the 8th European Social Network Conference, May 1-6, 2007, Corfu Island, Greece
- Dahlin, P., Fors, J., Havila, V. & Thilenius, P. (2005). *Netquakes - Describing Effects of Ending Business Relationships on Business Networks*. Paper presented at the 21st IMP-conference, Rotterdam, Netherlands, 1-3 September 2005.
- Dahlin, P., Fors, J. & Öberg, C. (2006). *Press releases, annual reports and newspaper articles - Using alternative data sources for studies on business network dynamics*. Paper presented at the 22nd annual IMP-conference, Milan, Italy, 7-9 September 2006.
- Dahlin, P. & Thilenius, P. (Eds.). (forthcoming). *Exploring Business Networks - The Character of Connections*. Västerås: Mälardalen University Press.
- Datta, D. K. (1991). Organizational Fit and Acquisition Performance: Effects of Post-acquisition Integration. *Strategic Management Journal*, 12(4), pp. 281-298.
- de Nooy, W., Mrvar, A. & Batagelj, V. (2005). *Exploratory network analysis with Pajek*. New York: Cambridge University Press
- Dean, J., Holmes, S. & Smith, S. (1997). Understanding business networks: Evidence from the manufacturing and service sectors in Australia. *Journal of Small Business Management*, 35(1), pp. 78-84.
- Dickson, G. W. & DeSanctis, G. (2001). *Information technology and the future enterprise : new models for managers*. Upper Saddle River, N.J.: Prentice Hall
- Didrichsen, J. (1972). The development of diversified and conglomerate firms in the United States, 1920-1970. *Business History Review*, 46(2), pp. 202-219.
- Dooley, K. & Zimmerman, B. (2003). Merger as Marriage: Communication Issues in Postmerger Integration. *Health Care Management Review*, 28(1), pp. 55-67.
- Doty, D. H. & Glick, W., H. (1994). Typologies as a unique form of theory building: Toward improved understanding and modeling. *Academy of Management. The Academy of Management Review*, 19(2), pp. 230-252.
- Dowling, G. R. (1983). The Application of General Systems Theory to an Analysis of Marketing Systems. *Journal of Macromarketing*, 3(2), pp. 22-32.
- Du Boff, R. B. & Herman, E. S. (1989). The Promotional-Financial Dynamic of Merger Movements: A Historical Perspective. *Journal of Economic Issues*, 23(1), pp. 107-134.
- Dubois, A. & Gadde, L.-E. (2002). The construction industry as a loosely coupled system: implications for productivity and innovation. *Construction Management & Economics*, 20(7), pp. 621-632.
- Dubois, A., Gadde, L.-E. & Mattsson, L.-G. (2003). Change and Continuity in the Supplier Base: A Case Study of a Manufacturing Firm 1964-2002. *Journal of Customer Behaviour*, 2, pp. 409-432.
- Dwyer, F. R., Schurr, P. H. & Oh, S. (1987). Developing Buyer-Seller Relationships. *Journal of Marketing*, 51(2), pp. 11-27.
- Easton, G. (1992). Industrial Networks: A Review. In B. Axelsson & G. Easton (Eds.), *Industrial Networks - A New View of Reality* (pp. 3-27). London: Routledge.

- Easton, G. (1995). Methodology and Industrial Networks. In K. Möller & D. T. Wilson (Eds.), *Business marketing : an interaction and network perspective* (pp. 411-492). Boston ; London: Kluwer Academic Publishers.
- Easton, G. & Håkansson, H. (1996). Markets as networks: Editorial introduction. *International Journal of Research in Marketing*, 13(5), pp. 407-413.
- Eckhardt, J. T. & Shane, S. A. (2003). Opportunities and Entrepreneurship. *Journal of Management*, 29(3), pp. 333-350.
- Edenholm, Y. (2001). Drabbade IT entreprenörer kräver förändring (*Eng. Affected IT-entrepreneurs demand a change*). *Computer Sweden*. 2001-04-23.
- Emery, F. E. & Trist, E. L. (1965). The causal texture of organizational environments. *Human Relations*, 18, pp. 21-32.
- Emirbayer, M. & Goodwin, J. (1994). Network Analysis, Culture, and the Problem of Agency. *The American Journal of Sociology*, 99(6), pp. 1411-1454.
- Erixon, L. (1988). *Ägande och inflytande i svenskt näringsliv: huvudbetänkande (Eng. Ownership and influence in Swedish industry)*. Stockholm: Allmänna förlaget. Ägarutredningen, Industridepartementet
- Everett, M. G. & Borgatti, S. P. (2005). Extending Centrality. In P. J. Carrington, J. Scott & S. Wasserman (Eds.), *Models and methods in social network analysis* (pp. 57-76). New York: Cambridge University Press.
- Evgeniou, T. (2002). Information Integration and Information Strategies for Adaptive Enterprises. *European Management Journal*, 20(5), pp. 486-494.
- Fahlén, O. (2001). 210 IT-företag dog när bubblan sprack (*Eng. 210 IT-companies died as the bubble burst*). *Dagens Industri*. 2001-01-05.
- Falke, M. (2007). China's new law on enterprise bankruptcy: a story with a happy end? *International Insolvency Review*, 16(1), pp. 63-74.
- Faust, K. & Skvoretz, J. (2002). Comparing Networks Across Space and Time, Size and Species. *Sociological Methodology*, 32(1), pp. 267-299.
- Federal Trade Commission. (1968). *Annual Report of the Federal Trade Commission*. Washington D.C.: U.S. Government Printing Office
- Feldman, L. J. (1998). Industry viewpoint: relational interdependency and punctuated equilibrium. *The Journal of Business & Industrial Marketing*, 13(3), pp. 288-293.
- Finansinspektionen. (2001). *Finanssektorns stabilitet 2001 (Eng. The Stability of the Swedish Financial Sector 2001)* (No. 2001:6): The Swedish Financial Supervisory Authority.
- Finkelstein, S. (1997). Interindustry merger patterns and resource dependence: A replication and extension of Pfeffer (1972). *Strategic Management Journal*, 18(10), pp. 787-810.
- Fluck, Z. & Lynch, A. W. (1999). Why do firms merge and then divest? A theory of financial synergy. *The Journal of Business*, 72(3), pp. 319-346.
- Ford, D. (1980). The Development of Buyer-Seller Relationships in Industrial Markets. *European Journal of Marketing*, 14(5-6), pp. 339-354.
- Ford, D. (1990). *Understanding business markets: interaction, relationships and networks*. London: Academic Press
- Ford, D. & Håkansson, H. (2006). The Idea of Business Interacion. *The IMP Journal*, 1(1), pp. 4-27.
- Ford, D. & Redwood, M. (2005). Making sense of network dynamics through network pictures: A longitudinal case study. *Industrial Marketing Management*, 34(7), pp. 648-657.
- Forouzan, B. A., Fegan, S. C. & Coombs, C. (2001). *Data communications and networking* (2. ed.). Boston: McGraw-Hill

- Forsgren, M., Holm, U. & Johanson, J. (2005). *Managing the embedded multinational : a business network view*. Cheltenham: Edward Elgar
- Forsgren, M., Holm, U. & Thilenius, P. (1997). Network Infusion in the Multinational Corporation. In M. Forsgren & I. Björkman (Eds.), *The Nature of the International Firm - Nordic Contributions to International Business Research* (pp. 475-494). Copenhagen: Handelshøjskolens Forlag.
- Forsgren, M. & Johanson, J. (1992). *Managing networks in international business*. Philadelphia: Gordon and Breach
- Forsgren, M. & Olsson, U. (1992). Power Balancing in an International Business Network. In M. Forsgren & J. Johanson (Eds.), *Managing Networks in International Business* (pp. 178-193). Philadelphia: Gordon & Breach.
- Forsström, P. (1998). IT-boomen är ingen bubbla (*Eng*. The IT-boom is not a bubble). *Vision*, 1998-06-15.
- Franks, J. & Mayer, C. (1996). Hostile takeovers and the correction of managerial failure. *Journal of Financial Economics*, 40(1), pp. 163-181.
- Freeman, L. C. (1979). Centrality in social networks conceptual clarification. *Social Networks*, 1(3), pp. 215-239.
- Freeman, L. C. (1980). The gatekeeper, pair-dependency and structural centrality. *Quality and Quantity*, 14(4), pp. 585-592.
- Freeman, L. C. (2000a). Social Network Analysis: Definition and History. In A. E. Kazdan (Ed.), *Encyclopedia of Psychology* (pp. 350-351). New York: Oxford University Press.
- Freeman, L. C. (2000b). Visualizing Social Networks. In *American Statistical Association 1999 Proceedings of the Section on Statistical Graphics* (pp. 47-54).
- Freeman, L. C. (2004). *The development of social network analysis : a study in the sociology of science*. Vancouver, BC / North Charleston, S.C.: Empirical Press; BookSurge
- Freytag, P. V. & Ritter, T. (2005). Dynamics of relationships and networks - creation, maintenance and destruction as managerial challenges. *Industrial Marketing Management*, 34(7), pp. 644-647.
- Friedman, T. L. (2000). *The Lexus and the olive tree* (1st Anchor Books ed.). New York: Anchor Books
- Fruchterman, T. M. J. & Reingold, E. M. (1991). Graph Drawing by Force-Directed Placement. *Software-Practice & Experience*, 21(11), pp. 1129-1164.
- Gadde, L.-E. & Håkansson, H. (1992). Analysing change and stability in distribution channels - a network approach. In B. Axelsson & G. Easton (Eds.), *Industrial networks - a new view of reality* (pp. 166-179). London: Routledge.
- Gadde, L.-E. & Mattsson, L.-G. (1987). Stability and Change in Network Relationships. *International Journal of Research in Marketing*, 4(1), pp. 29-42.
- Gao, L. S. & Iyer, B. (2006). Analyzing Complementarities Using Software Stacks for Software Industry Acquisitions. *Journal of Management Information Systems*, 23(2), pp. 119-148.
- Gaughan, P. A. (2005). *Mergers : what can go wrong and how to prevent it*. Hoboken, NJ: J. Wiley
- Gersick, C. J. G. (1991). Revolutionary Change Theories - A Multilevel Exploration of the Punctuated Equilibrium Paradigm. *Academy of Management Review*, 16(1), pp. 10-36.
- Gertsen, M. C., Sørderberg, A.-M. & Torp, J. E. (1998). Different Approaches to the Understanding of Culture in Mergers and Acquisitions. In M. C. Gertsen, A.-M. Sørderberg & J. E. Torp (Eds.), *Cultural Dimensions of International Mergers and Acquisitions*. Berlin: de Gruyter Studies in Organization.
- Ghuri, P. N., Hadjikhani, A. & Johanson, J. (2005). *Managing opportunity development in business networks*. Basingstoke: Palgrave Macmillan
- Giacomazzi, F., Panella, C., Pernici, B. & Sansoni, M. (1997). Information systems integration in mergers and acquisitions: A normative model. *Information and Management*, 32(6), pp. 289-302.

- Giller, C. & Matear, S. (2001). The termination of inter-firm relationships. *The Journal of Business & Industrial Marketing*, 16(2), pp. 94-112.
- Gilmore, A. (2003). *Services marketing and management*. London ; Thousand Oaks, California: Sage Publications
- Goldberg, L. G. (1973). The Effect of Conglomerate Mergers on Competition. *Journal of Law and Economics*, 16(1/Apr), pp. 137-158.
- Goldberg, W. H. (1983). *Mergers : motives, modes, methods*. Aldershot: Gower
- Gonsalves, A. (2006). Gartner Names Hot Technologies With Greatest Potential Impact, *InformationWeek*. August 9 2006
- Gow, G. (1995). What is technology? *Tech Directions*, 55(2), pp. 48-51.
- Grabher, G. (1993). *The embedded firm: on the socioeconomics of industrial networks*. London: Routledge
- Granovetter, M. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 78(6), pp. 1360-1380.
- Granovetter, M. (1982). The Strength of Weak Ties - A Network Theory Revisited. In P. V. Marsden (Ed.), *Social Structure and Network Analysis* (pp. 105-130). London: Sage Publications.
- Granovetter, M. (1985). Economic Action and Social Structure: The Problem of Embeddedness. *American Journal of Sociology*, 91(3), pp. 481 - 510.
- Grant, R. M. (2003). Strategic planning in a turbulent environment: Evidence from the oil majors. *Strategic Management Journal*, 24(6), pp. 491-517.
- Grant, R. M. & Cibin, R. (1996). Strategy, structure and market turbulence: the international oil majors, 1970-1991. *Scandinavian Journal of Management*, 12(2), pp. 165-188.
- Gulati, R. & Gargiulo, M. (1999). Where do interorganizational networks come from? *American Journal of Sociology*, 104(5), pp. 1439-1494.
- Hadjikhani, A. (1998). Political risk for project-selling firms: turbulence in relationships between business and non-business actors. *The Journal of Business and Industrial Marketing*, 13(3), pp. 235-255.
- Hadjikhani, A. & Thilenius, P. (2005). *Non-business actors in a business network : a comparative case on firms' actions in developing and developed countries*. Amsterdam, Oxford: Elsevier
- Halbheer, D. & Gärtner, D. (2006). *Are There Waves in Merger Activity after All?*. Socioeconomic Institute Working Paper No. 0414. Available at SSRN: <http://ssrn.com/abstract=730505>
- Haleblian, J. & Finkelstein, S. (1999). The Influence of Organizational Acquisition Experience on Acquisition Performance: A Behavioral Learning Perspective. *Administrative Science Quarterly*, 44(1), pp. 29-56.
- Haleblian, J. J., Kim, J. Y. J. & Rajagopalan, N. (2006). The influence of acquisition experience and performance on acquisition behavior: Evidence from the US commercial banking industry. *Academy of Management Journal*, 49(2), pp. 357-370.
- Halinen, A., Salmi, A. & Havila, V. (1999). From dyadic change to changing business networks: An analytical framework. *Journal of Management Studies*, 36(6), pp. 779-794.
- Halinen, A. & Tähtinen, J. (2002). A process theory of relationship ending. *International Journal of Service Industry Management*, 13(2), pp. 163-180.
- Halinen, A. & Törnroos, J.-Å. (1995). The meaning of time in the study of industrial buyer-seller relationships. In K. Möller & D. T. Wilson (Eds.), *Business Marketing: An Interaction and Network Perspective*. Boston: Kluwer Academic.
- Halinen, A. & Törnroos, J.-Å. (1998). The role of embeddedness in the evolution of business networks. *Scandinavian Journal of Management*, 14(3), pp. 187-205.
- Hallén, L., Johanson, J. & Seyed-Mohamed, N. (1991). Interfirm Adaptation in Business Relationships. *Journal of Marketing*, 55(2), pp. 29-37.

- Hallén, L. & Johanson, M. (2004). Integration of relationships and business network development in the Russian transition economy. *International Marketing Review*, 21(2), pp. 158-171.
- Handelsdepartementet. (1977). *Fusioner och förvärv i svenskt näringsliv 1969-73 : en fallstudie : delbetänkande av konkurrensutredningen (Eng. Mergers and Acquisitions in Swedish industry 1969-73 - a case study)*. Statens offentliga utredningar, 1977:51, Stockholm: LiberFörlag/Allmänna förlaget
- Hanly, K. (1992). Hostile Takeovers and Methods of Defense: A Stakeholder Analysis. *Journal of Business Ethics*, 11(12), pp. 895-914.
- Hannan, M. T. & Freeman, J. (1984). Structural Inertia and Organizational Change. *American Sociological Review*, 49(2), pp. 149-164.
- Hanweck, G. A. & Shull, B. (1999). The bank merger movement: Efficiency, stability and competitive policy concerns. *Antitrust Bulletin*, 44(2), pp. 251-284.
- Harary, F. (1959). Graph Theoretic Methods in the Management Sciences. *Management Science*, 5(4), pp. 387-403.
- Harrison, D. & Easton, G. (2002). Patterns of actor response to environmental change. *Journal of Business Research*, 55(7), pp. 545-552.
- Harrison, J. S. (2003). *Strategic management : of resources and relationships : concepts*. New York ; Chichester: Wiley
- Haspeslagh, P. C. & Jemison, D. B. (1991). *Managing acquisitions : creating value through corporate renewal*. New York: Free Press
- Haunschild, P. R. (1993). Interorganizational Imitation: The Impact of Interlocks on Corporate Acquisition Activity. *Administrative Science Quarterly*, 38(4), pp. 564-592.
- Havila, V. (1996). *International business-relationship triads : a study of the changing role of the intermediating actor*. Doctoral thesis, no. 64, Department of Business Studies, Uppsala University, Uppsala, Sweden.
- Havila, V., Johanson, J. & Thilenius, P. (2004). International business-relationship triads. *International Marketing Review*, 21(2), pp. 172-186.
- Havila, V. & Salmi, A. (2000). Spread of change in business networks: an empirical study of mergers and acquisitions in the graphic industry. *Journal of Strategic Marketing*, 8, pp. 105-119.
- Havila, V. & Salmi, A. (2002). Network Perspective on International Mergers and Acquisitions: What More Do We See? In V. Havila, M. Forsgren & H. Håkansson (Eds.), *Critical Perspectives on Internationalisation*: Pergamon.
- Havila, V. & Wilkinson, I. F. (2002). The principle of the conservation of business relationship energy: or many kinds of new beginnings. *Industrial Marketing Management*, 31(3), pp. 191-203.
- Hayward, M. L. A. (2002). When do Firms Learn from their Acquisition Experience? Evidence from 1990-1995. *Strategic Management Journal*, 23(1), pp. 21-40.
- Hedaa, L. (1993). Distrust, uncertainties and disconfirmed expectations in supplier-customer relationships. *International Business Review*, 2(2), pp. 191-206.
- Hedaa, L. & Törnroos, J.-Å. (1997). Understanding Event-based Business Networks. *Working paper 10-1997*. Department of Management, Politics and Philosophy; Copenhagen Business School.
- Hedaa, L. & Törnroos, J.-Å. (2002). Towards a Theory of Timing: Kairology in Business Networks. In R. Whipp, B. Adam & I. Sabelis (Eds.), *Making time : time and management in modern organizations* (pp. 31-45). Oxford: Oxford University Press.
- Hellblom, O. (2007). Rekord i företagsaffärer (Eng. Acquisition record). *Dagens Industri*. 2007-03-31. <http://di.se/Index/Nyheter/2007/03/31/227702.htm?src=xlink>

- Hellgren, B., Lowstedt, J., Puttonen, L., Tienari, J., Vaara, E. & Werr, A. (2002). How Issues Become (Re)constructed in the Media: Discursive Practices in the AstraZeneca Merger. *British Journal of Management*, 13(2), pp. 123-.
- Henders, B. (1992). *Positions in industrial networks : marketing newsprint in the UK*. Doctoral thesis, Department of Business Studies, Uppsala University, Uppsala.
- Henneberg, S. C., Mouzas, S. & Naudé, P. (2006). Network pictures: concepts and representations. *European Journal of Marketing*, 40(3), p. 408.
- Hertz, S. (1998). Domino effects in international networks. *Journal of Business to Business Marketing*, 5(3), pp. 3-31.
- Higgins, M. J. & Rodriguez, D. (2006). The outsourcing of R&D through acquisitions in the pharmaceutical industry. *Journal of Financial Economics*, 80(2), pp. 351-383.
- Hirshleifer, D. & Titman, S. (1990). Share Tendering Strategies and the Success of Hostile Takeover Bids. *The Journal of Political Economy*, 98(2), pp. 295-324.
- Hoch, D. J. (1999). *Secrets of software success : management insights from 100 software firms around the world*. Boston, Mass.: Harvard Business School
- Hofstede, G. (1983). The Cultural Relativity of Organizational Practices and Theories. *Journal of International Business Studies*, 14(2), pp. 75-89.
- Holmlund, M. (1997). *Perceived quality in business relationships*. Doctoral thesis, Svenska handelshögskolan, Helsinki, Finland.
- Holmlund, M. (2004). Analyzing business relationships and distinguishing different interaction levels. *Industrial Marketing Management*, 33(4), pp. 279-287.
- Holtström, J. (2003). *Suppliers in mergers and acquisitions: a study of relationship changes and synergy realisation*. Licentiate Thesis 1012, Department of Management and Economics, Linköping University, Linköping.
- Homburg, C. & Bucerius, M. (2005). A Marketing Perspective on Mergers and Acquisitions: How Marketing Integration Affects Postmerger Performance. *Journal of Marketing*, 69(1), pp. 95-114.
- Hopkins, H. D. (1987). Acquisition Strategy and the Market Position of Acquiring Firms. *Strategic Management Journal*, 8(6), pp. 535-547.
- Huisman, M. & Snijders, T. A. B. (2003). Statistical Analysis of Longitudinal Network Data With Changing Composition. *Sociological Methods & Research*, 32(2), pp. 253-288.
- Huisman, M. & van Duijn, M. A. J. (2005). Software for Social Network Analysis. In P. J. Carrington, J. Scott & S. Wasserman (Eds.), *Models and methods in social network analysis* (pp. 270-316). New York: Cambridge University Press.
- Hunt, J. W. (1990). Changing Pattern of Acquisition Behaviour in Takeovers and the Consequences for Acquisition Processes. *Strategic Management Journal*, 11(1), pp. 69-78.
- Håkansson, H. (1989). *Corporate technological behaviour: co-operation and networks*. London: Routledge
- Håkansson, H. (Ed.). (1982). *International marketing and purchasing of industrial goods : an interaction approach*. Chichester: Wiley.
- Håkansson, H. & Ford, D. (2002). How should companies interact in business networks? *Journal of Business Research*, 55(2), pp. 133-139.
- Håkansson, H. & Henders, B. (1995). Network Dynamics: Forces and Processes Underlying Evolution and Revolution in Business Networks. In K. Möller & D. T. Wilson (Eds.), *Business marketing : an interaction and network perspective* (pp. 139-154). Boston/London: Kluwer Academic Publishers.
- Håkansson, H. & Johanson, J. (1993). Networks as a Governance Structure. In G. Grabher (Ed.), *The Embedded Firm - On the Socioeconomics of Industrial Networks*. London: Routledge.

- Håkansson, H. & Lundgren, A. (1995). Industrial Networks and Technological Innovation. In K. Möller & D. T. Wilson (Eds.), *Business marketing : an interaction and network perspective* (pp. 291-320). Boston ; London: Kluwer Academic Publishers.
- Håkansson, H. & Snehota, I. (1989). No business is an island : the network concept of business strategy. *Scandinavian Journal of Management*, 5(3), pp. 187-200.
- Håkansson, H. & Snehota, I. (1995). *Developing relationships in business networks*. London: Routledge : International Thomson business
- Hägg, I. & Johanson, J. (1982). *Företag i nätverk : ny syn på konkurrenskraft (Eng. Firms in Networks)*. Stockholm: Studieförb. Näringsliv och samhälle (SN&S)
- Iacobucci, D., Henderson, G., Marcati, A. & Chang, J. (1996). Network analyses of brand switching behavior. *International Journal of Research in Marketing*, 13(5), pp. 415-429.
- Iacobucci, D. & Hopkins, N. (1992). Modeling Dyadic Interactions and Networks in Marketing. *JMR, Journal of Marketing Research*, 29(1), pp. 5-18.
- Iqbal, Z. (2002). The effects of bankruptcy filings on the competitors' earnings. *International Review of Economics & Finance*, 11(1), pp. 85-99.
- Jackson, T. H. (1985). The Fresh-Start Policy in Bankruptcy Law. *Harvard Law Review*, 98(7), pp. 1393-1449.
- Jensen, M. C. (1984). Takeovers: Folklore and Science. *Harvard Business Review*, 60(6), pp. 109-121.
- Johanson, J. (1989). Business Relationships and Industrial Networks. In *Perspectives on the Economics of Organisation: Crafoord Lectures 1*, Institute of Economic Research, Lund University Press.
- Johanson, J. & Mattsson, L.-G. (1988). Internationalization in industrial systems. A network approach. In N. Hood & J.-E. Vahlne (Eds.), *Strategies in Global Competition* (pp. 287-314). New York: Croom Helm.
- Johanson, J. & Mattsson, L.-G. (1992). Network Positions and Strategic Action - An Analytical Framework. In B. Axelsson & G. Easton (Eds.), *Industrial Networks. A New View of Reality* (pp. 205-217). London: Routledge.
- Johanson, J. & Vahlne, J.-E. (1977). The Internationalization Process of the Firm-A Model of Knowledge Development and Increasing Foreign Market Commitments. *Journal of International Business Studies*, 8(1), pp. 23-32.
- Johanson, J. & Vahlne, J.-E. (1990). The Mechanism of Internationalisation. *International Marketing Review*, 7(4), pp. 11-25.
- Johanson, J. & Vahlne, J.-E. (2006). Commitment and Opportunity Development in the Internationalization Process: A Note on the Uppsala Internationalization Process Model. *Management International Review*, 46(2), pp. 165-178.
- Johanson, M. (2001). *Searching the known, discovering the unknown : the Russian transition from plan to market as network change processes*. Uppsala,
- Johnson, R. (2006). Why 80% Of All Acquisitions Fail. *Supply House Times*, 49(2), pp. 90-92.
- Johnston, R. (2005). Service operations management: return to roots. *International Journal of Operations & Production Management*, 25(12), pp. 1278-1297.
- Jones, C., Hesterly, W. S. & Borgatti, S. P. (1997). A general theory of network governance: Exchange conditions and social mechanisms. *Academy of Management Review*, 22(4), pp. 911-945.
- Judd, R. C. (1964). The Case for Redefining Services. *Journal of Marketing*, 28(1), pp. 58-59.
- Justitiedepartementet. (2005). *Aktiebolagslagen*, Chapter 23, §1. SFS 2005:551
- Kamp, B. (2005). Formation and evolution of buyer-supplier relationships: Conceiving dynamism in actor composition of business networks. *Industrial Marketing Management*, 34(7), pp. 658-668.
- Keep, W. W., Hollander, S. C. & Dickinson, R. (1998). Forces impinging on long-term business-to-business relationships in the United States: An historical perspective. *Journal of Marketing*, 62(2), pp. 31-45.

- Kiessling, T. S. & Richey, R. G. (2005). International Acquisitions from a Network Perspective and Market Based Competencies. *Journal of Business Strategies*, 22(1), pp. 1-21.
- Kim, T. Y., Oh, H. & Swaminathan, A. (2006). Framing interorganizational network change: A network inertia perspective. *Academy of Management Review*, 31(3), pp. 704-720.
- Kimberly, J. R. (1976). Issues in the Design of Longitudinal Organizational Research. *Sociological Methods & Research*, 4, pp. 321-347.
- Kinch, N. (1987). Emerging strategies in a network context: The Volvo case. *Scandinavian Journal of Management Studies*, 3(3-4), pp. 167-184.
- Kirzner, I. M. (1997). Entrepreneurial Discovery and the Competitive Market Process: An Austrian Approach. *Journal of Economic Literature*, 35(1), pp. 60-85.
- Kjellberg, H. & Andersson, P. (2005). Stability and Change in Market Networks. In P. Andersson, S. Hertz & S. Sweet (Eds.), *Perspectives on market networks : boundaries and new connections* (pp. 53-73). Stockholm: Ekonomiska forskningsinstitutet vid Handelshögskolan i Stockholm.
- Kling, R. (1987). Defining the boundaries of computing across complex organizations. In R. J. J. Boland & R. Hirschheim (Eds.), *Critical Issues in Information Systems Research* (pp. 307-362). New York: John Wiley & Sons.
- Knoben, J., Oerlemans, L. A. G. & Rutten, R. P. J. H. (2006). Radical changes in inter-organizational network structures: The longitudinal gap. *Technological Forecasting and Social Change*, 73(4), pp. 390-404.
- Knoke, D. & Kuklinski, J. H. (1982). *Network analysis*. Beverly Hills, Calif.: Sage
- Koenig, M. E. D. & Mezick, E. M. (2004). Impact of mergers & acquisitions on research productivity within the pharmaceutical industry. *Scientometrics*, 59(1), pp. 157-169.
- Koka, B. R., Madhavan, R. & Prescott, J. E. (2006). The Evolution of Interfirm Networks: Environmental Effects on Patterns of Network Change. *Academy of Management Review*, 31(3), pp. 721-738.
- Konkurrensverket. (2002). *The pros and cons of merger control : 10th anniversary of the Swedish Competition Authority 2002*. Stockholm: Swedish Competition Authority (Konkurrensverket)
- Koponen, A. (2003). *Företagens väg mot konkurs (Eng. A Company's Road to Bankruptcy)*. Doctoral thesis, School of Business, Stockholm university, Stockholm.
- Krackhardt, D. (1992). The strength of strong ties: The importance of philos in organizations. In N. Nohria & R. G. Eccles (Eds.), *Networks and organizations: Structure, form and action* (pp. 216-239). Cambridge, MA: HBS Press.
- Krug, J. A. & Hegarty, W. H. (1997). Postacquisition turnover among US top management teams: An analysis of the effects of foreign vs. domestic acquisitions of US targets. *Strategic Management Journal*, 18(8), pp. 667-675.
- Kuhn, T. S. (1962). *The Structure of Scientific Revolutions*. University of Chicago Press: Chicago, London
- Kusewitt, J. B. (1985). An Explorative Study of Acquisition Factors Relating to Performance. *Strategic Management Journal*, 6, pp. 151-169.
- Lambrecht, B. M. (2004). The timing and terms of mergers motivated by economies of scale. *Journal of Financial Economics*, 72(1), pp. 41-62.
- Langley, A. (1999). Strategies for theorizing from process data. *Academy of Management Review*, 24(4), pp. 691-710.
- Larsson, R. (1990). *Coordination of Action in Mergers and Acquisitions: Interpretive and Systems Approaches towards Synergy*. Lund/Bromley: Lund Univ. Press/Chartwell-Bratt
- Larsson, R. & Risberg, A. (1998). Cultural Awareness and National versus Corporate Barriers to Acculturation. In M. C. Gertsen, A.-M. Söderberg & J. E. Torp (Eds.), *Cultural Dimensions of International Mergers and Acquisitions*. Berlin: de Gruyter Studies in Organization.
- Laumann, E. O. (2006). A 45-year Retrospective on Doing Networks. *Connections*, 27(1), pp. 65-90.

- Lehto, E. L. O. & Lehtoranta, M. O. (2004). Becoming an acquirer and becoming acquired. *Technological Forecasting and Social Change*, 71(6), pp. 635-650.
- Levine, D. W. (1996). Why choose one level of analysis? *Environment & Behavior*, 28(2), pp. 237-256.
- Lewis, B. (2000). The true future of Internet stocks: The bubble won't burst, it will slowly deflate. *InfoWorld*, 22(2), p. 68.
- Leydesdorff, L. (2007). Visualization of the citation impact environments of scientific journals: An online mapping exercise. *Journal of the American Society for Information Science and Technology*, 58(1), pp. 25-25.
- Liautaud, B. & Hammond, M. (2000). *e-Business Intelligence - Turning Information into Knowledge into Profit*. New York: McGraw-Hill
- Lindh, C. (2006). *Business relationships and integration of information technology*. Doctoral thesis, School of Business, Mälardalen University, Västerås.
- Lindqvist, C. (2000). Boom för IT-fonderna (Eng. Boom for the IT unit trust). *FinansTidningen*. 2000-02-15.
- Lindroth, J. (2003). Fler konkurser och sammanslagningar (Eng. More bankruptcies and mergers). In *Konsultguiden 2003*.
- Lindström, M. (2000). Blandade råd på DN:s nätsida. "Lyft på stenarna för att hitta substansen i affärsidéerna", föreslår en debattör (Eng. Mixed advised on DN:s webpage. "Lift the stones to find the substance in the business ideas" is suggested). *Dagens Nyheter*, p. A11. 2000-04-17.
- Linn, S. C. & Zhu, Z. (1997). Aggregate merger activity: New evidence on the wave hypothesis. *Southern Economic Journal*, 64(1), pp. 130-.
- Ljunggren, A. (1912). *Ekonomiska Sammanslutningar af Monopolistisk Natur i Sverige (Eng. Economic Combinations of Monopolistic Nature in Sweden)*. Stockholm: Norstedts affärsbibliotek
- Low, B. K. H. (1996). Long-term relationship in industrial marketing - Reality or rhetoric? *Industrial Marketing Management*, 25(1), pp. 23-35.
- Low, B. K. H. (1997). Managing business relationships and positions in industrial networks. *Industrial Marketing Management*, 26(2), pp. 189-202.
- Lovelock, C. H. (1983). Classifying Services to Gain Strategic Marketing Insights. *Journal of Marketing*, 47(3), pp. 9-21.
- Lu, C.-C. (2006). Growth Strategies and Merger Patterns among Small and Medium-Sized Enterprises: An Empirical Study. *International Journal of Management*, 23(3), pp. 529-547.
- Lubatkin, M. (1983). Mergers and the Performance of the Acquiring Firm. *Academy of Management Review*, 8(2), pp. 218-225.
- Lundgren, A. (1995). *Technological innovation and network evolution*. London: Routledge
- Lüdemann, A., Weicht, D., Selbig, J. & Kopka, J. (2004). PaVESy: Pathway Visualization and Editing System. *Bioinformatics*, 20(16), pp. 2841-2844.
- Lynch, B. P. (1974). An Empirical Assessment of Perrow's Technology Construct. *Administrative Science Quarterly*, 19(3), pp. 338-356.
- Löfvendahl, J. (1999). IT-bubblan kan spricka till jul (Eng. The IT-bubble might burst at christmas). *Göteborgs-Posten*. 1999-12-15.
- Madhavan, R., Koka, B. R. & Prescott, J. E. (1998). Networks in transition: How industry events (re)shape interfirm relationships. *Strategic Management Journal*, 19(5), pp. 439-459.
- Malkoff, A. R. (1979). Foreign Acquisition Analysis: A Suggested Approach. *Management Accounting*, 60(12), pp. 32-32.
- March, R. H. (1996). *Physics for poets* (4. ed.). New York: McGraw-Hill
- Marsden, P. V. (2002). Egocentric and sociocentric measures of network centrality. *Social Networks*, 24(4), pp. 407-422.

- Mattsson, L.-G. (1997). "Relationship Marketing" and the "Markets-as-Networks Approach" - A comparative analysis of two evolving streams of research. *Journal of Marketing Management*, 13, pp. 447-461.
- Mattsson, L.-G. (2000). *Merger waves and contemporary internationalization of firms and markets*. Paper presented at the IMP-conference, Bath, UK.
- McBeath, I. & Bacha, J. (2001). Mergers and acquisitions: A consideration of the drivers and hurdles. *Journal of Commercial Biotechnology*, 8(2), pp. 147-153.
- McCullough, R. C. I. (1991). Bankruptcy Fraud: Crime Without Punishment. *Commercial Law Journal*, 96(3), pp. 257-297.
- Melicher, R. W. (1969). An Analysis of Changes in the Merger Valuation Processes of Listed Industrial Corporations During the Current Merger Movement, 1950-1966. *Journal of Finance*, 24(5/Dec), pp. 963-964.
- Melin, L. (1992). Internationalization as a strategy process. *Strategic Management Journal*, pp. 99-119.
- Merriam-Webster. Online edition, from <http://www.m-w.com/>
- Miles, M. B. & Huberman, A. M. (1994). *Qualitative data analysis : an expanded sourcebook* (2. ed.). Thousand Oaks, CA: Sage
- Miller, D. & Friesen, P. H. (1982). The Longitudinal Analysis of Organizations: A Methodological Perspective. *Management Science*, 28(9), pp. 1013-1035.
- Mintzberg, H. (1983). *Structure in fives : designing effective organizations*. Englewood Cliffs, N.J.: Prentice-Hall
- Mintzberg, H., Ahlstrand, B. W. & Lampel, J. (1998). *Strategy safari : the complete guide through the wilds of strategic management*. Harlow: Financial Times Prentice Hall
- Mintzberg, H. & McHugh, A. (1985). Strategy Formation in an Adhocracy. *Administrative Science Quarterly*, 30(2), pp. 160-197.
- Morgan, R. E. (1999). Environmental determinants of export decision making: conceptual issues regarding the domestic market. *European Business Review*, 99(5), pp. 323-331.
- Morgan, R. M. & Hunt, S. D. (1994). The Commitment-Trust Theory of Relationship Marketing. *Journal of Marketing*, 58(3), pp. 20-38.
- Morris, M. & Schurink, C. v. E. (1993). Pricing behavior in industrial markets: The impact of environmental dynamics. *The Journal of Business & Industrial Marketing*, 8(3), pp. 28-44.
- Moulton, W. N. & Thomas, H. (1993). Bankruptcy as a Deliberate Strategy: Theoretical Considerations and Empirical Evidence. *Strategic Management Journal*, 14(2), pp. 125-135.
- Mueller, D. C. (1985). Mergers and Market Share. *The Review of Economics and Statistics*, 67(2), pp. 259-267.
- Muller, P., Rosner, G. L., De Lorio, M. & MacEachern, S. (2005). A nonparametric Bayesian model for inference in related longitudinal studies. *Journal of the Royal Statistical Society. Series C, Applied Statistics*, 54(3), pp. 611-626.
- Nahavandi, A. & Malekzadeh, A. R. (1988). Acculturation in Mergers and Acquisitions. *Academy of Management Review*, 13(1), pp. 79-90.
- Nakamura, H. R. (2005). *Motives, partner selection and productivity effects of M&As : the pattern of Japanese mergers and acquisitions*. Doctoral thesis, Institute of International Business, Stockholm School of Economics, Stockholm.
- Napier, N. K. (1989). Mergers and Acquisitions, Human Resource Issues and Outcomes: A Review and Suggested Typology. *The Journal of Management Studies*, 26(3), pp. 271-290.
- Neale, B., Milsom, T., Hills, C. & Sharples, J. (1998). The Hostile Takeover Process: A Case Study of Granada Versus Forte. *European Management Journal*, 16(2), pp. 230-241.

- Nelson, R. E. (1989). The Strength of Strong Ties: Social Networks and Intergroup Conflict in Organizations. *The Academy of Management Journal*, 32(2), pp. 377-401.
- Nelson, R. L. (1959). *Merger movements in American industry 1895-1956*. Princeton, N.J.: Princeton University Press
- Neuendorf, K. A. (2002). *The content analysis guidebook*. London: Sage Publications
- Neugebauer, R. & van der Laan, M. J. (2006). Causal effects in longitudinal studies: Definition and maximum likelihood estimation. *Computational Statistics and Data Analysis*, 51(3), pp. 1664-1675.
- Newman, M. E. J. (2003). The Structure and Function of Complex Networks. *SIAM Review*, 45(2), pp. 167-257.
- Nguyen, T. H., Séror, A. & Devinney, T. M. (1990). Diversification Strategy and Performance in Canadian Manufacturing Firms. *Strategic Management Journal*, 11(5), pp. 411-418.
- Nielson, C. C. (1996). An empirical examination of switching cost investments in business-to-business marketing relationships. *The Journal of Business & Industrial Marketing*, 11(6), pp. 38-60.
- Norton, C. L. & Smith, R. E. (1979). A Comparison of General Price Level and Historical Cost Financial Statements in the Prediction of Bankruptcy. *The Accounting Review*, 54(1), pp. 72-87.
- Norton, L. P. (1998). Merger mayhem. *Barron's*, 78(16), pp. 33-38.
- Ohl, C. M., Pincus, J. D., Rimmer, T. & Harrison, D. (1995). Agenda building role of news releases in corporate takeovers. *Public Relations Review*, 21(2), pp. 89-101.
- Orlikowski, W. J. & Iacono, C. S. (2001). Research commentary: Desperately seeking "IT" in IT research - A call to theorizing the IT artifact. *Information Systems Research*, 12(2), pp. 121-134.
- Ostroff, C. & Harrison, D. A. (1999). Meta-analysis, level of analysis, and best estimates of population correlations: Cautions for interpreting meta-analytic results in organizational behavior. *Journal of Applied Psychology*, 84(2), pp. 260-270.
- Otchere, I. & Ip, E. (2006). Intra-industry effects of completed and cancelled cross border acquisitions in Australia: A test of the acquisition probability hypothesis. *Pacific-Basin Finance Journal*, 14(2), pp. 209-230.
- Oxford English Dictionary. Online edition, from <http://dictionary.oed.com>
- Pablo, A. L., Sifkin, S. B. & Jemison, D. B. (1996). Acquisition decision-making processes: The central role of risk. *Journal of Management*, 22(5), pp. 723-746.
- Pahlberg, C. & Persson, M. (2005). Business Opportunities, Subsidiaries and Interpreneurial Activity. In P. N. Ghauri, A. Hadjikhani & J. Johanson (Eds.), *Managing opportunity development in business networks* (pp. 127-145). Basingstoke: Palgrave Macmillan.
- Pahlberg, C. & Thilenius, P. (2005). Opportunity Development for Ongoing Business Relationships. In P. N. Ghauri, A. Hadjikhani & J. Johanson (Eds.), *Managing opportunity development in business networks* (pp. 250-268). Basingstoke: Palgrave Macmillan.
- Parkhe, A., Wasserman, S. & Ralston, D. A. (2006). New frontiers in network theory development. *Academy of Management Review*, 31(3), pp. 560-568.
- Pearce, J. A. I. & Robinson, J. R. B. (2004). Hostile takeover defenses that maximize shareholder wealth. *Business Horizons*, 47(5), pp. 15-24.
- Pelham, A. M. (1999). Influence of Environment, Strategy, and Market Orientation on Performance in Small Manufacturing Firms - A Critical Review and Conceptual Framework. *Journal of Business Research*, 45(1), pp. 33-46.
- Penrose, E. T. (1959). *The theory of the growth of the firm*. Oxford: Basil Blackwell
- Pentland, B. T. & Feldman, M. S. (2005). Organizational routines as a unit of analysis. *Industrial and corporate change*, 14(5), pp. 793-815.

- Perrow, C. (1967). A Framework for the Comparative Analysis of Organizations. *American Sociological Review*, 32(2), pp. 194-208.
- Perrow, C. (1972). *Complex organizations : a critical essay*. Glenview: Scott Foresman
- Perry, J. S. & Herd, T. J. (2004). Reducing M&A risk through improved due diligence. *Strategy and Leadership*, 32(2), pp. 12-19.
- Petterson, P. (2000). Det e-nog nu... (Eng. IT is enough now...). *Dagens IT*. 2000-02-15.
- Pettigrew, A. M. (1990). Longitudinal Field Research on Change: Theory and Practice. *Organization Science*, 1(3), pp. 267-292.
- Pettigrew, A. M. (1997). What is processual analysis? *Scandinavian Journal of Management*, 13(4), pp. 337-348.
- Pfeffer, J. (1972). Merger as a Response to Organizational Interdependence. *Administrative Science Quarterly*, 17(3), pp. 382-394.
- Pfeffer, J. & Salancik, G. R. (1978). *The external control of organizations : a resource dependence perspective*. New York: Harper & Row
- Porter, K., Bunker Whittington, K. & Powell, W. W. (2005). The Institutional Embeddedness of High-Tech Regions: Relational Foundations of the Boston Biotechnology Community. In S. Breschi & F. Malerba (Eds.), *Clusters, Networks and Innovation*. Oxford University Press.
- Porter, M. E. (1979). How Competitive Forces Shape Strategy. *Harvard Business Review*, 57(2), pp. 137-145.
- Porter, M. E. (1980). *Competitive strategy : techniques for analyzing industries and competitors*. New York: Free Press
- Porter, M. E. (1987). From Competitive Advantage to Corporate Strategy. *Harvard Business Review*, 65(3), pp. 43-60.
- Porter, M. E. (1998a). *Competitive advantage: creating and sustaining superior performance - with a new introduction* (1st Free Press ed.). New York: Free Press
- Porter, M. E. (1998b). *Competitive strategy : techniques for analyzing industries and competitors* (Repr. ed.). New York: Free Press
- Powell, W. W. (1990). Neither Market nor Hierarchy - Network Forms of Organization. *Research in Organizational Behavior*, 12, pp. 295-336.
- Prabhu, J. C., Chandy, R. K. & Ellis, M. E. (2005). The impact of acquisitions on innovation: Poison pill, placebo, or tonic? *Journal of Marketing*, 69(1), pp. 114-130.
- Pradhan, S. P. (2000). Network destruction: The structural implications of downsizing. *Academy of Management Journal*, 43(1), pp. 101-112.
- Prekert, F. & Hallén, L. (2006). Conceptualising, delineating and analysing business networks. *European Journal of Marketing*, 40(3), pp. 384-407.
- Puranam, P., Powell, B. C. & Singh, H. (2006). Due diligence failure as a signal detection problem. *Strategic Organization*, 4(4), pp. 319-348.
- Rajiv, S., Rudy, H. & Tim, G. (2001). The Dynamics of Alignment: Insights from a Punctuated Equilibrium Model. *Organization Science*, 12(2), pp. 179-197.
- Ranft, A. L. & Lord, M. D. (2002). Acquiring new technologies and capabilities: A grounded model of acquisition implementation. *Organization Science*, 13(4), pp. 420-441.
- Reid, D. (2004). Marketing-Related Motives in Mergers & Acquisitions: The Perspective of the U.S. Food Industry. *Academy of Marketing Science. Journal*, 32(1), pp. 98-99.
- Reimers, K., Johnston, R. B. & Klein, S. (2004). *The Shaping of Inter-Organizational Information Systems: Main Design Considerations of an International Comparative Research Project*. Paper presented at the 17th Blend eCommerce Conference, Bled, Slovenia, 21-23 June 2004.

- Richardson, G. B. (1972). The Organisation of Industry. *The Economic Journal*, 82(127), pp. 883-896.
- Risberg, A. (2001). Employee experiences of acquisition processes. *Journal of World Business*, 36(1), pp. 58-84.
- Rissman, E. R. (1997). Measuring labor market turbulence. *Economic Perspectives*, 21(3), pp. 2-14.
- Ritter, T., Wilkinson, I. F. & Johnston, W. J. (2004). Managing in complex business networks. *Industrial Marketing Management*, 33(3), pp. 175-183.
- Robbins, S. (1995). Turbulent times for information technology. *Association for Computing Machinery. Communications of the ACM*, 38(5), pp. 15-17.
- Roberts, B. (1999). The Bigger The Better? *Electronic Business*, 25(11), pp. 90-97.
- Rohrbough, L. (1991). New for PC: database tracks high-tech partnerships - Itsunami's Information Technology Strategic Alliances - Product Announcement. *Newsweek Interactive*. 24 December 1991.
- Rydén, B. (1971). *Fusioner i svensk industri : en kartläggning och orsaksanalys av svenska industriföretags fusionsverksamhet 1946-69 (Eng. Mergers in Swedish industry: an empirical analysis of corporate mergers in Swedish industry, 1946-69)*. Stockholm: Industriens utredningsinstitut, Almqvist & Wiksell (distr.)
- Salant, S. W., Switzer, S. & Reynolds, R. J. (1983). Losses from Horizontal Merger: The Effects of an Exogenous Change in Industry Structure on Cournot-Nash Equilibrium. *The Quarterly Journal of Economics*, 98(2), pp. 185-199.
- Salganik, M. J. & Heckathorn, D. D. (2004). Sampling and Estimation in Hidden Populations Using Respondent-Driven Sampling. *Sociological Methodology*, 34(1), pp. 193-240.
- Salmi, A. (1995). *Institutionally changing business networks : an analysis of a Finnish company's operations in exporting to the Soviet Union, Russia and the Baltic states*. Helsinki: Helsinki School of Economics and Business Administration
- Salmi, A. (2000). Entry into turbulent business networks - The case of a Western company on the Estonian market. *European Journal of Marketing*, 34(11), pp. 1374-1390.
- Salter, M. S. & Weinhold, W. A. (1981). Choosing compatible acquisitions. *Harvard business review*, 59(1), pp. 117-127.
- Sandberg, Å. & Augustsson, F. (2002). *Interactive Media in Sweden 2001 - The Second Interactive Media, Internet and Multimedia Industry Survey (No. 2002:2): Work Life in Transition*, National Institute for Working Life.
- Sandén, W. (1997). www.boom.se. *Veckans Affärer 1997-03-10*, pp. 32-39.
- Sandström, M. (1990). *Atmosphere in International Business Relationships*. Licentiate Thesis, Department of Business Studies, Uppsala University, Uppsala, Sweden.
- Schmitz, P. W. & Sliwka, D. (2001). On Synergies and Vertical Integration. *International Journal of Industrial Organization*, 19(8), pp. 1281-1295.
- Schurr, P. H. (2007). Buyer-seller relationship development episodes: theories and methods. *Journal of Business & Industrial Marketing*, 22(3), pp. 154-160.
- Schweiger, D. M. & Goulet, P. K. (2000). Integrating Mergers and Acquisitions: An international research review. *Advances in Mergers and Acquisitions*, 1, pp. 61-91.
- Scott, J. (1990). *A matter of record : documentary sources in social research*. Cambridge: Polity
- Scott, J. (2000). *Social network analysis : a handbook (2. ed.)*. London: SAGE
- Selznick, P. (1957). *Leadership in administration : a sociological interpretation*. New York: Harper & Row publ.
- Sharp, J. F. (1983). Find the Right Partner for Your Company. *Financial Executive*, 51(6), pp. 23-26.

- Sheth, J. N. (2007). Emerging research opportunities for doctoral students in B-to-B marketing. *Journal of Business-to-Business Marketing*, 14(1), pp. 13-22.
- Sheth, J. N., Gardner, D. M. & Garrett, D. E. (1988). *Marketing theory : evolution and evaluation*. New York: Wiley
- Shostack, G. L. (1987). Service Positioning Through Structural Change. *Journal of Marketing*, 51(1), pp. 34-43.
- Shrieves, R. E. & Stevens, D. L. (1979). Bankruptcy Avoidance as a Motive for Merger. *Journal of Financial and Quantitative Analysis*, 14(3), pp. 501-501.
- Shrivastava, P. (1986). Postmerger integration. *The Journal of Business Strategy*, 7(1), pp. 65-76.
- Shusterman, T. G., Norsworthy, J. R. & Bessler, W. (2000). Stock market reaction to the announcement of mergers and acquisitions in the US telecommunications industry. *Engineering Management Society, 2000. Proceedings of the 2000 IEEE*, pp. 446-452.
- Silverman, D. (1985a). A place for interview data. In D. Silverman (Ed.), *Qualitative methodology and sociology : describing the social world* (pp. 156-177). Aldershot: Gower.
- Silverman, D. (1985b). *Qualitative methodology and sociology : describing the social world*. Aldershot: Gower
- Silverman, S. & Solomon, M. (1998). The Unit of Analysis in Field Research: Issues and Approaches to Design and Data Analysis. *Journal of Teaching in Physical Education*, 17(3), pp. 270-285.
- Singh, H. & Montgomery, C. A. (1987). Corporate Acquisition Strategies and Economic Performance. *Strategic Management Journal*, 8(4), pp. 377-386.
- Sirover, M. L. & Lipin, S. (2003). Investor Communications: New Rules for M&A Success. *Financial Executive*, 19(1), pp. 26-31.
- Smith, J., McCarthy John, D., McPhail, C. & Augustyn, B. (2001). From Protest to Agenda Building: Description Bias in Media Coverage of Protest Events in Washington, D.C. *Social Forces*, 79(4), pp. 1397-1423.
- Smythe, D. J. (2001). The great merger movement and the diffusion of electric power utilization in American manufacturing, 1899-1909: A simple test of the Schumpeterian hypothesis. *Eastern Economic Journal*, 27(3), pp. 253-266.
- Snehota, I. (1990). *Notes on a theory of business enterprise*. Doctoral thesis, Department of Business Studies, Uppsala University, Uppsala.
- Snijders, T. A. B. (2005). Models for Longitudinal Network Data. In P. J. Carrington, J. Scott & S. Wasserman (Eds.), *Models and methods in social network analysis* (pp. 215-247). New York: Cambridge University Press.
- Stahl, G. K. & Sitkin, S. B. (2002). Trust in Corporate Acquisitions. *INSEAD Working paper 2002/61/ABA*. INSEAD. Available at <http://ged.insead.edu/fichiersti/inseadwp2002/2002-61.pdf>
- Street, C. T. & Cameron, A.-F. (2007). External Relationships and the Small Business: A Review of Small Business Alliance and Network Research. *Journal of Small Business Management*, 45(2), pp. 239-266.
- Swedberg, R. (1994). Markets as Social Structures. In R. Swedberg & N. J. Smelser (Eds.), *The handbook of economic sociology* (pp. 255-282). Princeton, N.J.: Princeton Univ. Press.
- Swedish Financial Supervisory Authority. (2001). *Finanssektorns stabilitet 2001 (Eng. The Stability of the Swedish Financial Sector 2001)* (No. 2001:6): The Swedish Financial Supervisory Authority (Finansinspektionen).
- Svenska Dagbladet. (2001). APROPÅ IT: Inte mediernas fel att bubblan blåstes upp (Eng. CONCERNING IT: Not the media's fault that the bubble was inflated). *Svenska Dagbladet*. 2001-02-17.
- Söderström, H. T. (2001). Som tur var sprack it-bubblan (Eng. Luckily, the IT-bubble burst). *Vision*, p. 15. 2001-11-08.

- Tan, H. B. & Hooy, C. W. (2004). Bank merger and bank stock volatility: a post-announcement analysis. *Managerial Finance*, 30(4), pp. 29-47.
- Tavakoli, A. & Kefalidis, D. (1995). Mergers and acquisitions in the construction industry. *Cost Engineering*, 37(1), pp. 25-30.
- The Concise Oxford English Dictionary. Oxford Reference Online, Oxford University Press. Retrieved 7 December 2006 from <http://www.oxfordreference.com/>
- Thilenius, P. (1997). *Subsidiary network context in international firms*. Doctoral Thesis No. 68, Department of Business Studies, Uppsala University, Uppsala.
- Thomas, R. & Ford, D. (1995). Technology and Networks. In K. Möller & D. T. Wilson (Eds.), *Business marketing : an interaction and network perspective* (pp. 263-290). Boston ; London: Kluwer Academic Publishers.
- Thompson, J. D. (1967). *Organizations in action : social science bases of administrative theory*. New York: Mc Graw-Hill
- Thompson, S. (1997). Takeover activity among financial mutuals: An analysis of target characteristics. *Journal of Banking & Finance*, 21(1), pp. 37-53.
- Thorelli, H. B. (1986). Networks: Between Markets and Hierarchies. *Strategic Management Journal*, 7(1), pp. 37-52.
- Thurrow, L. C. (1995). Surviving in a turbulent environment. *Planning Review*, 23(5), pp. 24-30.
- Thwaites, D. & Glaister, K. (1992). Strategic Responses to Environmental Turbulence. *The International Journal of Bank Marketing*, 10(3), pp. 33-41.
- Tienari, J., Vaara, E. & Björkman, I. (2003). Global capitalism meets national spirit: Discourses in media texts on a cross-border acquisition. *Journal of Management Inquiry*, 12(4), pp. 377-393.
- Town, R. J. (1992). Merger waves and the structure of merger and acquisition time-series. *Journal of Applied Econometrics*, 7, pp. S83-S100.
- Trautwein, F. (1990). Merger Motives and Merger Prescriptions. *Strategic Management Journal*, 11(4), pp. 283-295.
- Tsvetovat, M. & Carley, K. M. (2007). On effectiveness of wiretap programs in mapping social networks. *Computational and Mathematical Organization Theory*, 13(1), pp. 63-87.
- Tuominen, P. & Kettunen, U. (2003). To fade or not to fade? That is the question in customer relationships, too. *Managing Service Quality*, 13(2), pp. 112-123.
- Turnbull, P. W. & Valla, J.-P. (1986). Strategic Planning in Industrial Marketing: An Interaction Approach. *European Journal of Marketing*, 20(7), pp. 5-21.
- Tushman, M. L., Newman, W. H. & Romanelli, E. (1986). Convergence and Upheaval: Managing the Unsteady Pace of Organizational Evolution. *California Management Review*, 29(1), pp. 29-45.
- Tuttle, D. B. (1997). A classification system for understanding individual differences in temporal orientation among processual researchers and organizational informants. *Scandinavian Journal of Management*, 13(4), pp. 349-366.
- Twisk, J. & de Vente, W. (2002). Attrition in longitudinal studies - How to deal with missing data. *Journal of Clinical Epidemiology*, 55(4), pp. 329-337.
- Tähtinen, J., Blois, K. & Mittilä, T. (2004). *The Variety of Business Relationships and Their Endings*. Paper presented at the 3rd Nordic Workshop on Relationship Dissolution, Kukkolaforsen, Sweden, 17-19 September 2004.
- Tähtinen, J. & Halinen, A. (2002). Research on ending exchange relationships: A categorization, assessment and outlook. *Marketing Theory*, 2(2), pp. 165-188.
- U.S. Geological Survey. Magnitude / Intensity Comparison. Retrieved 10 April 2007 from http://earthquake.usgs.gov/learning/topics/mag_vs_int.php

- Unlimited Travel Group. (2006). Inbjudan till teckning av aktier i Unlimited Travel Group UTG AB (publ) (Eng. Prospectus for admission to the stock exchange of Unlimited Travel Group UTG AB (publ)) from <http://www.avanza.se/aza/events/utg/UTG-prospekt.pdf>
- Uusitalo, O. & Möller, K. (1997). Macro Network Dynamics - The Evolution of the Flat Glass Industry. In H. G. Gemünden, T. Ritter & A. Walter (Eds.), *Relationships and Networks in International Markets* (pp. 411-426). Oxford: Elsevier.
- Uzzi, B. (1996). The Sources and Consequences of Embeddedness for the Economic Performance of Organizations: The Network Effect. *American Sociological Review*, 61(4), pp. 674-698.
- Uzzi, B. & Spiro, J. (2005). Collaboration and creativity: The small world problem. *American Journal of Sociology*, 111(2), pp. 447-504.
- Vaara, E. (1992). *Mergers and acquisitions between Finland and Sweden : 1981-1991 : an analysis of success in four cases*. Helsinki: Helsingin kauppakorkeakoulu
- Wallström, M. (1995). Förfärfvebern rasar på (Eng. The Acquisition Fever Rage On). *Computer Sweden*. 1995-10-13.
- Walsh, J. P. (1989). Doing a deal: Merger and Acquisition negotiations and their impact upon target company top management turnover. *Strategic Management Journal*, 10, pp. 307-322.
- Walsh, J. P. & Ellwood, J. W. (1991). Mergers, Acquisitions, and the Pruning of Managerial Deadwood. *Strategic Management Journal*, 12(3), pp. 201-218.
- Waluszewski, A. (1990). *Framväxten av en ny mekanisk massateknik : en utvecklingshistoria* (Eng. *The emergence of a new mechanical pulping technique : a development story*). Uppsala/Stockholm: University Distributor; Almqvist & Wiksell International distributör
- van de Ven, A. H. (1992). Suggestions for Studying Strategy Process: A Research Note. *Strategic Management Journal*, pp. 169-192.
- Van de Ven, A. H. & Poole, M. S. (1995). Explaining development and change in organizations. *Academy of Management. The Academy of Management Review*, 20(3), pp. 510-541.
- Wang, M. & Fitzmaurice, G. M. (2006). A Simple Imputation Method for Longitudinal Studies with Non-ignorable Non-responses. *Biometrical Journal*, 48(2), pp. 302-318.
- Wang, Z. (2007). Technological innovation and market turbulence: The dot-com experience. *Review of Economic Dynamics*, 10(1), pp. 78-105.
- Vanhaverbeke, W., Duysters, G. & Noorderhaven, N. (2002). External technology sourcing through alliances or acquisitions: An analysis of the application-specific integrated circuits industry. *Organization Science*, 13(6), pp. 714-733.
- Varaiya, N. P. & Ferris, K. R. (1987). Overpaying in Corporate Takeovers: The Winner's Curse. *Financial Analysts Journal*, 43(3), pp. 64-71.
- Warner, J. B. (1977). Bankruptcy Costs - Some Evidence. *The Journal of Finance*, 32(2), pp. 337-337.
- Wasserman, S. & Faust, K. (1994). *Social network analysis : methods and applications*. Cambridge University Press
- Wasserman, S. & Iacobucci, D. (1988). Sequential social network data. *Psychometrika*, V53(2), pp. 261-282.
- Watson, R. T. (2003). *Data management : databases and organizations* (4th ed.). Hoboken, NJ: Wiley
- Watts, D. J. (2004). *Six degrees : the science of a connected age*. London: Vintage
- Watts, D. J. & Strogatz, S. H. (1998). Collective dynamics of 'small-world' networks. *Nature*, 393(6684), pp. 440-443.
- Webster, F. E. (1979). *Industrial marketing strategy*. New York: Ronald P.
- Veckans Affärer. (1998a). IT-sektorn är en riktig bubbla (Eng. The IT-sector is a real bubble). *Veckans Affärer*. 1998-04-20.

- Veckans Affärer. (1998b). IT på börsen - en växande bubbla (Eng. IT on the stockmarket - a growing bubble). *Veckans Affärer*. 1998-06-02.
- Wei, W. W. S. (2006). *Time series analysis : univariate and multivariate methods* (2. ed.). Boston: Pearson/Addison-Wesley
- Weick, K. E. (1979). *The social psychology of organizing* (2. ed.). Reading, Mass.: Addison-Wesley
- Weidner, R. T. & Sells, R. L. (1975). *Elementary physics : classical and modern*. Boston: Allyn and Bacon
- Weimao, K., Borner, K. & Viswanath, L. (2004). Major Information Visualization Authors, Papers and Topics in the ACM Library. *Information Visualization, 2004. INFOVIS 2004. IEEE Symposium*.
- Welch, C. (2000). The archaeology of business networks: the use of archival records in case study research. *Journal of Strategic Marketing*(8), pp. 197-208.
- Wellman, B. (1988). Structural Analysis: From Method and Metaphor to Theory and Substance. In B. Wellman & S. D. Berkowitz (Eds.), *Social structures: a network approach*. Cambridge: Cambridge University Press.
- Wellman, B. & Berkowitz, S. D. (1988). *Social structures : a network approach*. Cambridge: Cambridge Univ. Press
- Wemmerlöv, U. (1990). A Taxonomy for Service Processes and its Implications for System Design. *International Journal of Service Industry Management*, 1(3).
- Ventura, J. (2004). *The bankruptcy kit* (3rd ed.). Chicago, IL: Dearborn Trade Pub.
- Weston, J. F. (1952). The Recent Merger Movement. *The Journal of Business of the University of Chicago*, 25(1), pp. 30-38.
- Weston, J. F. & Weaver, S. C. (2001). *Mergers and acquisitions*. New York: McGraw-Hill
- Wetherell, M., Taylor, S. & Yates, S. J. (2001). *Discourse as Data : a guide for analysis*. London: Sage in association with the Open University
- White, R. T. & Arzi, H. J. (2005). Longitudinal Studies: Designs, Validity, Practicality, and Value. *Research in Science Education*, 35(1), pp. 137-149.
- Wilkinson, I., Wiley, J. & Lin, A. (2001). Modeling the Structural Dynamics of Industrial Marketing Systems. *InterJournal Complex Systems*, Paper #409.
- Wilson, B. D. (1980). The Propensity of Multinational Companies to Expand through Acquisitions. *Journal of International Business Studies*, 11(1), pp. 59-65.
- Wilson, D. T. & Möller, K. (1995). Dynamics of Relationship Development. In K. Möller & D. T. Wilson (Eds.), *Business marketing : an interaction and network perspective* (pp. 53-69). Boston ; London: Kluwer Academic Publishers.
- Windelband, W. & Oakes, G. (1980). History and Natural Science. *History and Theory*, 19(2), pp. 165-168.
- Withey, M., Daft, R. L. & Cooper, W. H. (1983). Measures of Perrow's Work Unit Technology: An Empirical Assessment and a New Scale. *The Academy of Management Journal*, 26(1), pp. 45-63.
- Vonortas, N. S. & Safioleas, S. P. (1997). Strategic alliances in information technology and developing country firms: Recent evidence. *World Development*, 25(5), pp. 657-680.
- Woodward, J. (1965). *Industrial organisation : theory and practice*. London: Oxford Univ. Press
- Woodward, S. N. (1982). The Myth of Turbulence. *Futures*, 14(4), pp. 266-280.
- Wright, P., Kroll, M., Lado, A. & Ness, B. V. (2002). The structure of ownership and corporate acquisition strategies. *Strategic Management Journal*, 23(1), pp. 41-53.
- Vujakovic, P. (1998). Reading between the lines: Using news media materials for Geography. *Journal of Geography in Higher Education*, 22(1), pp. 147-155.
- Wynstra, F., Axelsson, B. & van der Valk, W. (2006). An application-based classification to understand buyer-supplier interaction in business services. *International Journal of Service Industry Management*, 17(5), pp. 474-496.

- Xavier, F. B. & Hunt, R. A. (2002). Strategy in turbulent times. *Managerial Auditing Journal*, 17(1-2), pp. 55-59.
- Yamagishi, T., Gillmore, M. R. & Cook, K. S. (1988). Network Connections and the Distribution of Power in Exchange Networks. *American Journal of Sociology*, 93(4), pp. 833-851.
- Yip, G. S. (1982). Diversification Entry: Internal Development Versus Acquisition. *Strategic Management Journal*, 3(4), pp. 331-345.
- Youk, A. O., Stone, R. A. & Marsh, G. M. (2004). A method for imputing missing data in longitudinal studies. *Annals of Epidemiology*, 14(5), pp. 354-361.
- Zeithaml, V. A., Parasuraman, A. & Berry, L. L. (1985). Problems and Strategies in Services Marketing. *Journal of Marketing*, 49(2), pp. 33-47.
- Åkerlund, H. (2004). *Fading Customer Relationships*. Doctoral Thesis, Department of Marketing and Corporate Geography, HANKEN Swedish School of Economics and Business Administration, Helsinki, Finland.
- Öberg, C. (2004). *On Customers in Mergers and Acquisitions*. Licentiate Thesis No. 1145, Department of Management and Economics, Linköping University, Linköping.
- Öberg, C. & Holtström, J. (2006). Are mergers and acquisitions contagious? *Journal of Business Research*, 59(12), pp. 1267-1275.



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