LUND UNIVERSITY
School of Economics and Management

Master Programme in Economic Growth, Innovation and Spatial Dynamics

Stockholm's Corporate Information Services' Adaptability to Digitalization

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Abstract: Nine Stockholm-based joint-stock data analysis and web hosting companies are hereby united in an external financial analysis, ranging from 1998 to 2007. The main contributions to the body of knowledge comprise observations regarding the companies' management efficiency and their survival of "the dot-com crisis". Given the fact that the firms' resource bases are their differentiating factors, resource management is emphasized as the solution for competitive success. The consequences of the dot-com crisis upon their profitability are examined on basis of common management theory and accounting standards. The findings describe the companies' efforts of capitalizing on diverse information technology innovations, as well as the profitability of their internal management. A successful internal financial management was found be beneficial for their profitability. The paper distinguishes between successful and less successful resource allocations by pinpointing the identified risks. The process of digitalization was nevertheless found to be a catalyst of the companies' profitability. In the shape of "media convergence", it diminished the negative effects of the "media fragmentation" phenomenon and the consequences of the dot-com crisis. The analyzed companies are vital information distributors of the regional economy and important carriers of technological development into related sectors. Their efforts of adapting to the occurring digitalization trajectory were mainly defined to be diverse technological upgrades and increasingly endowed Internet-supported solutions.

Key words: dot-com crisis, data analysis and web hosting, profitability, resource-based view, management, digitalization, innovation, media convergence, media fragmentation

EKHR21
Master thesis (15 credits ECTS)
November 2009
Supervisor: Kent Johansson, Kent.Johansson@ekh.lu.se
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1 Introduction

This case study is my First Year Independent Master Thesis at Lund University's Master Programme in "Economic Growth, Innovation and Spatial Dynamics". Its cognitive value lies within the findings obtained from a profitability analysis of nine Stockholm-based *joint-stock data analysis and web hosting* companies over a period of ten years, ranging from 1998 to 2007. The main contributions to the body of knowledge comprise the efficiency of the companies' management and their survival of "the dot-com crisis".

In the early twenty-first century, the IT-sector survived the bursting of the "dot-com bubble" (O'Reilly 2005; NationMaster 2005). *Stockholm's OMX IT and Telecommunication stock* data indicate the shaken economic development:

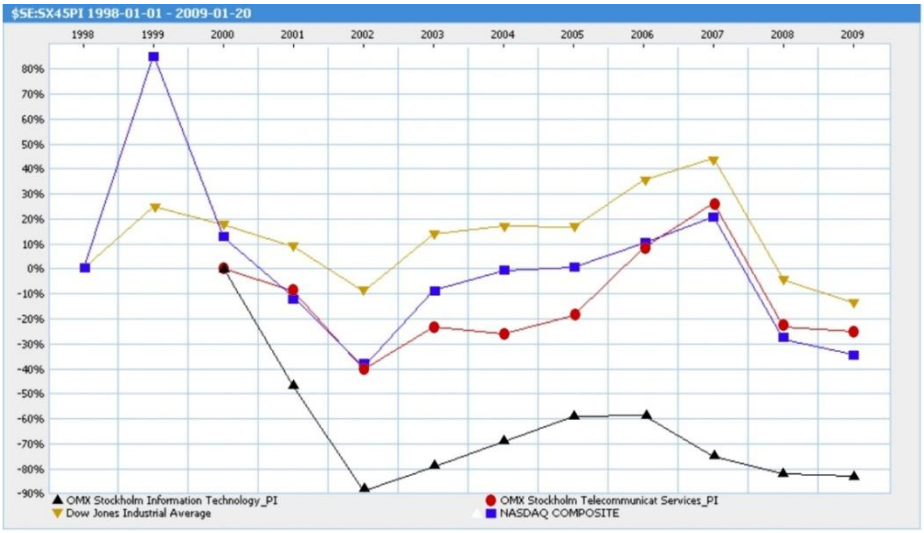

Figure 1a *Stockholm's OMX IT and Telecom Development 1998 to 2009 (MSN Money 2009).*

The IT sector's stock declined seriously from 2000 to 2002 and did not recover after the crisis, although minor improvements are visible. The chart depicts a smaller decline within the OMX Telecommunication stock during the studied period. The average values of the Dow Jones and NASDAQ stocks also indicate declines during the analyzed decade. The year 2007 is a new important turning point of all the presented sectors, as the series declined up to date.

OMX All Share Price Index series were also collected (OMX Stockholm PI 2009). Figure 1b presents the series and the monthly differences for the period 2000 to 2007:

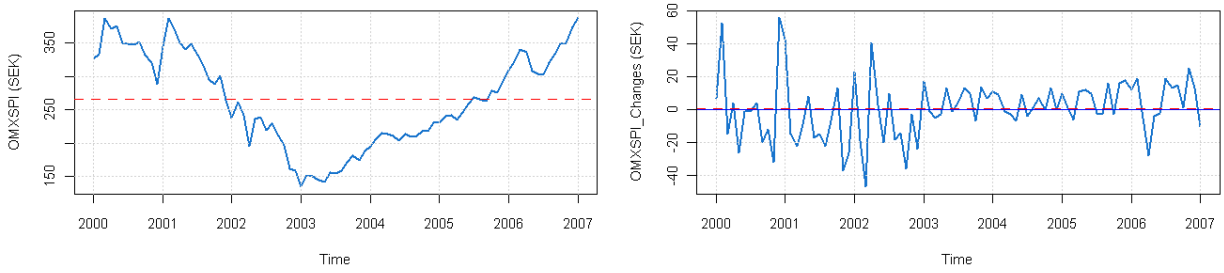

Figure 1b *OMXSPI Stock and Monthly Differences 2000 to 2007(OMX Stockholm PI 2009).*

A decline is observable during and shortly after the crisis in the left figure and this fact is in convergence with the findings of Figure 1a. The OMXSPI stock levels indicate a scarcer development from 2001 to 2006. The right figure presents the changes' intensity. The years 2000 to 2002 are volatile. A stabilization of the market occurred by 2003. If any negative consequences are present within the analyzed companies' profitability, this economic shock is the plausible external effect.

Nevertheless, the annual growth rates of *gross domestic product* in USA, EU16 and Sweden indicate serious economic downturns during the dot-com crisis period:

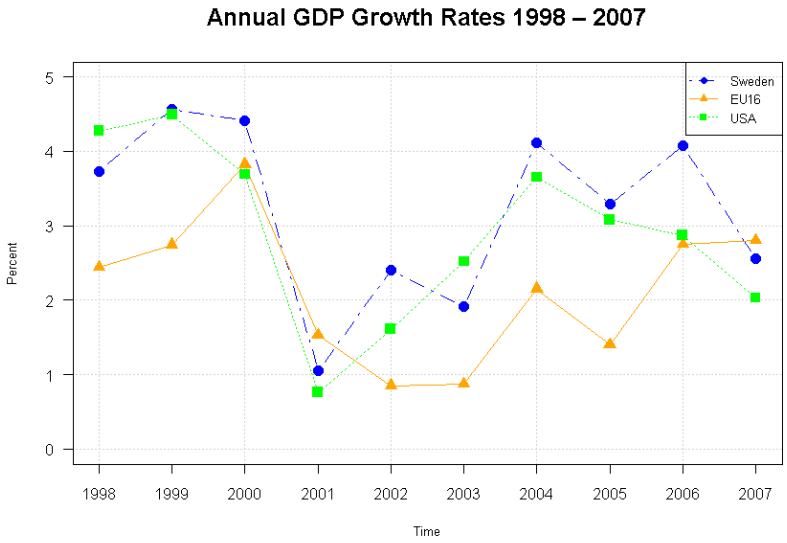

Figure 1c *GDP in Sweden, Western Europe 16 (EU15 - Luxemburg + Switzerland + Norway) and USA 1998 to 2006 (Maddison 2009), Extended with 2007 (IMF 2009).*

The dot-com crisis had thus pervasive consequences even in the international arena. All the analyzed regions' GDP decreased radically in 2001 and did not recover to their initial values after the crisis. Sweden managed to increase its gross domestic product more than the average achievements of the EU16 and the United States.

The dot-com crisis' effects on production were observable within the whole national service sector. The *value-added* created by the Swedish service producers was declining, although the *hours worked* and *employment rates* increased, see Figure 1d. Services have thus been declining in profitability since 1998 and did not recover until 2007. The profitability of the early years of the analysis decade was totally gone by 2007, as the gap between value-added and hours worked converges. The services' value-added decreased from 61.60 percent in 1998 to 60.26 percent in 2007 and the hours worked increased from 55.37 percent in 1998 to 59.93 percent by 2007. The employment rate increased from 72 percent in 1998 to 76 percent in 2007. The decade's work trend is also visible in the *hour surplus* values, and these have been increasing in amount since 2002, the time when least hours were worked in relation to the previous year's hours.

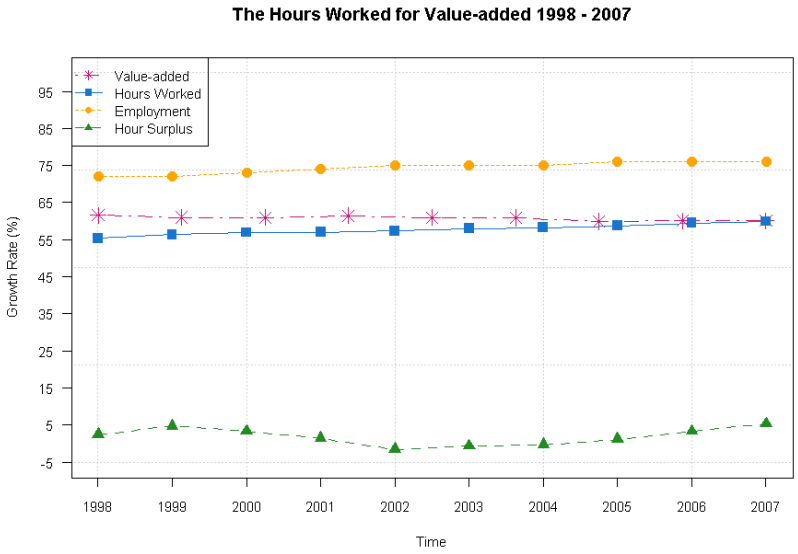

Figure 1d *Sweden's Worked Hours for Value-added within the Service Sector 1998 to 2007 (Statistics Sweden 2009a and 2009b).*

1.1 Research Justification

Given the fact that the economies experienced the "*dot-com stock crash*", it is of interest to define how the selected companies managed their business, which consequences this event brought to profitability and which internal aspects made some companies more successful than the others.

The research topic is furthermore of importance due to the fact that media has been an important *information carrier* of the modern society for a long time. The data analysis and web hosting companies distribute and create technological solutions of information management, acting hence as vital information intermediaries. Their products and services must thus constantly posses the right qualities and they must adapt successfully to new market configurations and rapid technological development. Nevertheless, these companies are contributors to the national economic welfare.

The ongoing processes of digitalization and globalization disrupted the media industry's traditional structure, causing *disintermediation* of media firms and an unstable deliverance to an increasingly disaggregated public mass. This development was partially held responsible for losses of customer shares and diminished influential power. The interaction between media companies and customers had to adapt to the new platforms, marketing channels and innovated ways of communication which derived from the traditional business configurations. Postpone to the "*fragmentation of the mass audience*"[1], media companies could inter alia be bypassed by the companies' "*in-house*" information production. The technologically co-integrated and pro-globalization pool of the "*New Information Society*" companies capitalized on changed native forces. In agreement with Adam Smith's theory, free trade and division of labour among nations create greater efficiency in aggregate production through specialization (Encyclopædia Britannica 2009b).

[1] In the Digital Age, the lost "monopoly" of broadcasters and publishers to a stable audience diverged into customer targeting through several optional channels (Encyclopædia Britannica 2009a).

1.2 Aim and Scope

The master thesis' main belief is that *a company's profitability depends on the practiced management and performed investments*. The fact that "the dot-com crisis" occurred during the analyzed period offers the possibility of obtaining information about the companies' development before, during and after this crisis. Since the analyzed companies are from the same region and industrial segment, their main distinguishing factor is their *internal management*. The main scope is hence to enhance the understanding of how they were successfully managed in difficult times.

The findings aim to be useful in promoting media companies' continued development by defining indicators of management efficiency. By comparing diverse key measurements of the companies' annual reports in an *external financial analysis*, the major differences between them should be revealed. The most profitable factors can hence be stated and at the same time, learning can be provided from the unsuccessful companies' experience.

1.3 Delimitation and Target Group

The focus boundary comprises Stockholm's information services' industry, with an emphasis on the *data analysis and web hosting* sector. These companies are important media carriers and have a strong connection to the sector of Information Technologies. They tend to deliver their products through "all-digital" channels, although "traditional" solutions can be produced on basis of their services. The analytic delimitation is set to the companies' *profitability* since it defines their deliverance capacity of qualitative products in demand and offers competitive advantages. When demand is stimulated and the practised management is effective, a company can achieve higher market shares and increasing customer bases.

All companies and diverse organizations which are interested in improving their profit and competitive power are welcome to consult this work, as well as fellow students.

1.4 Disposition

The research design follows the IMRAD[2] disposition model and established regulations for master level theses at Lund University. The sequence of chapters guides the reader throughout the: introduction, background, conceptual framework, applied methodology and elaboration process, analyses and conclusions. References are sometimes made to complementary appendices, which can be found in this paper's final part.

[2] Introduction, Method, Result and Discussion (Strömquist 2005:27).

2 Background

This section begins with a survey over *previous research findings* within the selected industrial sector. The time-specific business conditions are thereafter analyzed in terms of *bankruptcies*, as well as *market entries* and *exits* in order to define the time-specific business development trends.

2.1 A Historical Perspective on the New Media Environment

In the pre-computer society, the media industry was equipped for large-scale reproduction and distribution, playing a key role in the diffusion of culture and information (Lucchi 2006:29). When machinery was attributed immaterial aspects, such as technical "know how" and "management of work", the concept of "techniques" was distinguished from "technologies" (Edquist and Edqvist 1979:9). Rendering technologies "obsolete" became a concept of the past after the protection of digital content was introduced (Lucchi 2006:23). The media industry took advantage of these regulations, which granted control over intellectual works and constituted entry barriers for competitors (Lucchi 2006:29). The new technologies created trade opportunities through their compatibility. Digitalization allowed for the separation of *content* from the *carriers*. "The Information Technology Revolution" allowed for the digitalization of every type of content, bringing deep changes in the society and in the traditional business models. The digital media's intangible nature made publishing and distributor companies' presence less important. The *cost structure* and *strategies* of content intermediaries were affected as well, as "it became costly to produce but cheap to reproduce". (Lucchi 2006:11)

The *disruption* of the traditional media settlement allowed the customers to become producers through the multitude of technological products. The new communication technologies were sometimes associated with differing interests of the general public and of the owners of intellectual property rights. In order to combat exclusion from the transaction processes, *stricter copyright production measures* and *exclusive rights* were invoked. The established rights and the contracts' imposed conditions make them enforceable, i.e. right-holders can expand copy and distribution rights regardless of "The Copyright Law" statements (Lucchi 2006:32). When contractual obligations were restrictive, absolute monopoly could still be obtained. (Lucchi 2006:135-136)

Efficient *technological encapsulation, prevention of illegal copying* and possibilities of *on-line payment* and *private copying* became main profitability channels. The market exchange shifted towards *leasing, renting, membership, access* and *subscription transactions*. New trade relationships are materialized by "short-term access between servers and clients", operating in networked relationships. The most common existing forms are: *access contracts* (entrance possibilities to information systems or use of the systems in specific purposes) and *mass-market licenses* (electronic contracts, standards and non-negotiable licenses used by software and information providers). *Access* and *copying* were correlated in such manner that the latter was strictly conditioned by the former. Services could be leased within networks of providers and users and a large number are now deliverable through electronic networks. The barrier of entry is constituted by *access to content*, not the ownership of the physical medium which carries the work. In the new economy, access is primary to the exchange of information. Power and control are obtained through accumulation of intellectual capital and *access to ideas, knowledge and expertise*. (Lucchi 2006:19-36)

The *reconfiguration of the technological systems* and the *remediation*[3] *of content* evolved side by side with the implementation of *Internet-adaptability* into businesses. The Internet's ownership is more fragmented than that of the traditional media segments. Yet, this co-evolution allows for greater *innovation* and *freedom of services* and *products* than the traditional media platforms did. Not only the carrier devices and technologies vary, but also their design. Enhancement is now found in multimedia, the combination of hyper-linking with audio and video streams in on-line publications. *Absorption* is the concept of one medium fully capturing another one. Video games have for example absorbed the cinematic abilities of motion pictures, whilst the phenomenon of refashioning enables users to see the composite whole of tiled windows on diverse devices' screens. These different techniques adapt, remix, sample, reshape and innovate. New expression modes, relationships and content modifications are *value-adding*, *stabilizing* and *centralizing* media core forces. New innovation cycles, adaptation and reinvention of media trends and technologies reconfigure the mediums. (Lievrouw 2006:8)

Transparency on markets and *unbundling of content and technologies* are fundamental to *diversity* and *innovation*. Most European nations have now adapted to the European Parliament's and Council's formulations of "*increased openness and transparency*", which aim to increase protection of investors and security markets and encourage a free movement of persons, goods and services (ALDE 2006:22-23). Market openness is important in the restructuring of content and platforms, making fair competition a necessity. Choice is considered fundamental within the theory of competition and can directly affect products' and services' quality. (Ungerer 2005:58)

Differentiation is nevertheless made possible through the *modes of presentation*, e.g. decoders, software interfaces or devices. Consumers are offered new ways to create, distribute and benefit of digital content (Lucchi 2006:17-19). The possibilities of marketing towards an increasingly diverse and stratified customer base increased along with the customers' shifting expectations. (Lucchi 2006:15) Since the 1990s, *virtual reality* and *tele-presence technologies* have been successfully launched as platforms for creative work, research spaces, training environments and social spaces (Encyclopædia Britannica 2009c).

In business, the *encoding* method of a new medium is more influential than the *decoding* one, because of the perceptions associated with the method. In electronic communication, *"compensatory adaptation"* is referring to the individuals' voluntary and involuntary attempts of compensating for the obstacles posted by unnatural mediums of communication. The main part of our evolutionary history comprised natural communication mediums, often in face-to-face collaboration. This arising liability of newness and feeling of certain ambiguity reduced the speed of operation and increased the cognitive efforts required in the use of new technologies or interactive mediums. Once familiarity occurred with the mediums and the process became well-known, "*mechanical*" reductions were often the last ones remaining, e.g. the speed of typing in comparison with the fluency of speech or technological performance. (Kock 2007:176-177)

[3] The representation of one medium in another.

2.2 The Regional Market Development

Figure 2.2a presents the *entries* and *exits* of joint-stock companies in the Stockholm area. The crisis' impact on the corporate welfare is obvious, as fewer new joint-stock companies entered the market and the exits increased:

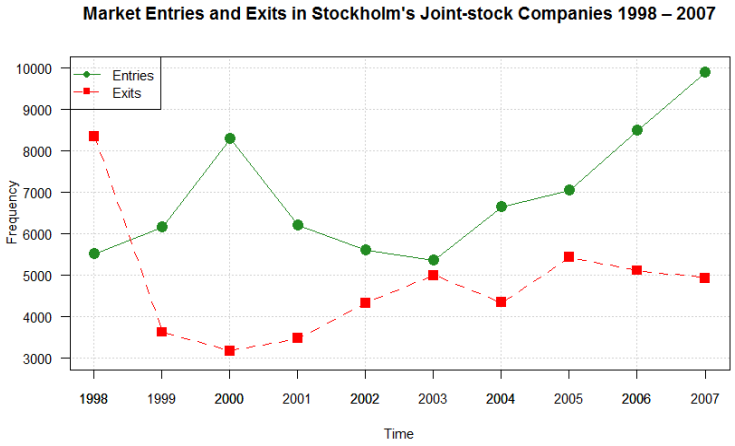

Figure 2.2a *Market Entries and Exits in Stockholm's Joint-stock Companies 1998 to 2007 (Bolagsverket 2009).*

After the crisis, a stabilization of the market is observable, as the amount of exits was not as frequent as the increasing amount of new joint-stock companies which entered. Years after the crisis, by 2007, the gap between the new entries and exits was the largest, indicating a healthy concurrency base of the regional economy.

Bankruptcies are a common reason of market exits. Figure 2.2b presents bankruptcies within the joint-stock companies of the Stockholm area. The bankruptcies were more frequent in 2001, 2002 and 2003, than in 1998 to 2000, most credibly as a consequence of the dot-com crisis. By 2004, the bankruptcies diminished, indicating a stabilization of the market:

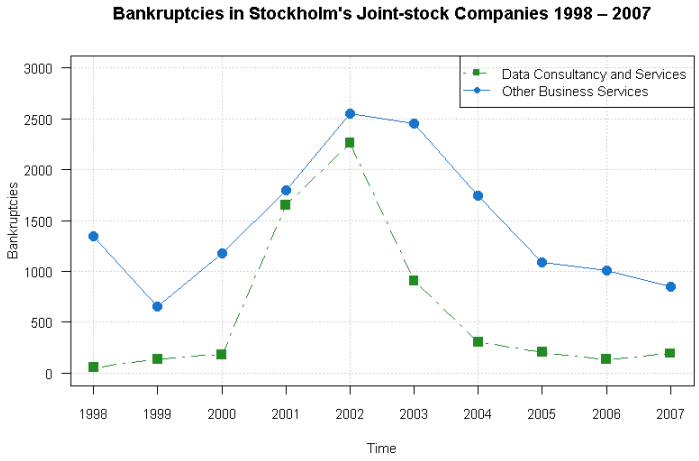

Figure 2.2b *Bankruptcies in Stockholm's Joint-stock Companies 1998 to 2007 (Statistics Sweden 2009c).*

Figure A1a in Appendix 1 presents the multi-factor productivity, labor and capital input annual growth rates in relation to the growth rate of the Swedish GDP. Declines are observable in all the measurements in 2001. The multi-factor productivity increased in 2002, but suffered an average decline afterwards, as the hours worked and the capital shortages continued to decline until 2004. An improvement is visible in the hours worked and capital services input in 2006, but the level of multi-factor productivity declined. The average level of GDP was higher after the crisis than in 2001 and it increased until 2006. In 2007, a new decline is visible.

Given these observations, it is hence clear that these vital inputs indicate lower levels of productivity during and after the dot-com crisis than before. The increase in market entries and the decrease in bankruptcies after 2004 can hence be associated with Figure A1a, since the economic situation improved somewhat after this year.

3 The Conceptual Framework

This chapter presents the theoretical representation of the corporate arena and the native development forces. The first section, "Industrial Competition and Innovation", discusses the role of competition and innovation in economic evolution by underpinning the underlying premises. The second section, "Micro-initiated Growth", treats the companies' efforts of generating profit and development through the "resource-based perspective". Common causes of business failure are thereafter discussed in relation to strengths of corporate management by outlining the theoretical support of the relevant empirical measurements.

3.1 Industrial Competition and Innovation

Competition patterns affirm corporate power at both the national and local levels, transforming "the comparative advantage" into "competitive operational effectiveness" (Porter 1998a:322-323). *Porter's Diamond Theory* is a suitable concept for strengthening the internal competitive advantages. A firm's position in a given location significantly affects its position elsewhere (Porter 1998a:313). The advantage of location is recognized in economic theory and can especially be found in *clusters* and *other geographical concentrations of firms*. Rules, incentives and norms, which are specific to the local rivalry, affect the firms' strategies and their production capacity. Since imitation is common, competition invites to *upgrades* and *innovation*. (Porter 1998a:324-325) Policies can influence demand through *regulations*. In response, companies adapt through *specialization, innovation, development* and *flexible production standards*. (Porter 1998a:327-328) Specialized suppliers and related industries can be regarded as potential associates. Although location within a cluster usually offers part of collective assets, technologies and knowledge, geographical proximity is not always important. New products, speed and flexibility allow companies to share business processes on the global scale. (Porter 1998a:329)

Porter's belief is that *complexity* is a competition-securing attribute which is found in firms, industries, clusters and economies due to their multifaceted organizational structure. This complexity offers competitive resistance by impeding easy imitation and reproduction. *Firm size* and *market shares* are considered to be *outputs* and *not causes* of competitive advantages. (Porter 1998b:xvii) Competitive advantages result from the value which the companies are able to create for their customers and is materialized through *value chains* (Porter 1998b:xxii-:xviii). By according attention to the *surrounding environmental forces*, the companies' management, location and competitive power are improvable. (Porter 1998a:329)

Geographical proximity increases the efficiency of information transactions and exchange, creating economic externalities which yield *profitability* and *local competitive advantages*. (Keeble and Nachum 2000:9) The new societal-oriented corporate competition permits conditional *growth* and *differentiation* through production mechanisms and advantages of location. Resources are selectively accessible and more sources are considerable due to the globalization process and technological development. (Porter 1998c:11) The most successful businesses are believed to be those which combine *advanced technological knowledge* with *management skills* (Storey and Tether 1998:1041).

Privatization of state-owned companies is believed to have a positive effect on the economic development and is recommended. In the present, the governmental institutionalization structures form a considerable share in the OECD-countries. A fourth of Stockholm's joint-stock market's value was state owned in 2008. A too high concentration of state-ownership is believed to hinder innovation and corporate activities and diminish a healthy concurrency, since new actors can be discouraged. (OECD Economic Survey of Sweden 2008:8)

The competitive ability is nevertheless sensitive to the occurrence of diminished strategic value due to industrial evolution (Porter 1980:44). Technological change can cause drastic *price reductions* and positively affect a firm's position (Porter 1998b:13-14). Technologically progressive sectors serve as *"carrier industries"* in the diffusion of new technological advantages (Edquist and Edqvist 1978:8; Ahlin and Godinho 1979:121; Edquist and Edqvist 1979:7; Edquist and Edqvist 1980:45; Acha 2005:429).

Another academic study (Eliasson 2000) indicates that great macroeconomic effects are expected from the integration of *information and communication technologies* with the *innovative products* of the user industry. The *digital* information's generic nature can be successfully combined and coordinated with industrial equipment. Production systems and information flows can hence be profitably combined to achieve enhanced productivity. (Eliasson 2000:5-7)

Figure 3.1a presents the European turnover rates from *innovation* as percentages of total turnover in 2004 and 2006. The charts indicate that innovation was beneficial and increasingly frequent in Sweden, even after the dot-com crisis. Innovation is thus a plausible development indicator which helped in the recovery after the dot-com crisis.

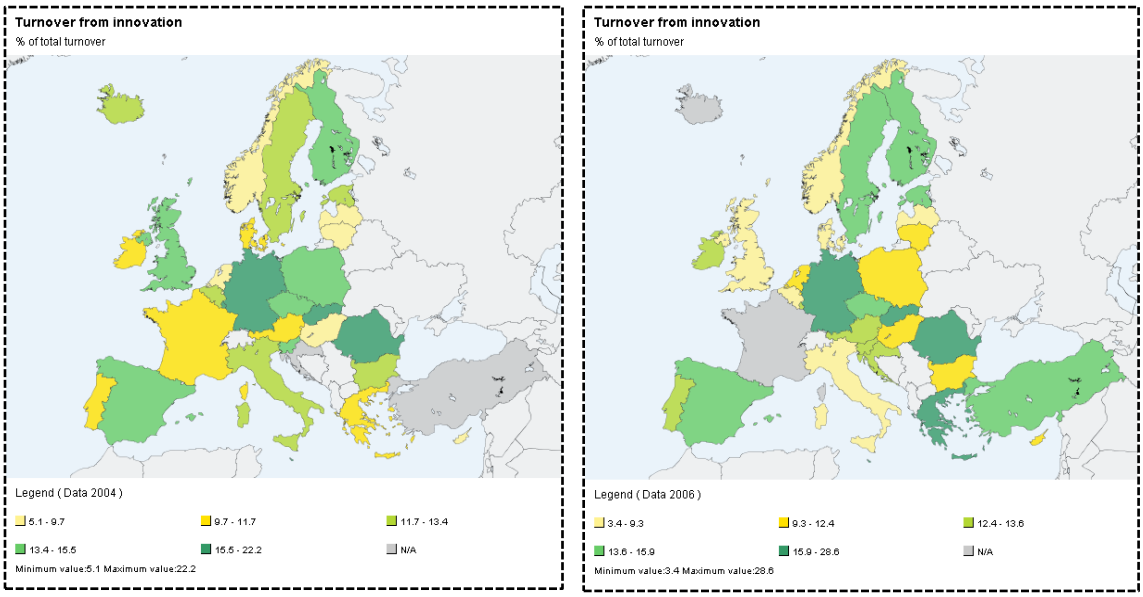

Figure 3.1a *European Turnover Rate from Innovation as Percentage of Total Turnover. A Comparison between 2004 and 2006 (Eurostat 2009).*

From the socio-economic perspective, *new general purpose technologies* were defined to be driving economic forces of each decade (Rhode and Toniolo 2006:13). An OECD study of our "*Information Society*" shows that in the 1990s, the development of the information infrastructure sought to ensure "*information highways*". These investments created a new dimension of communication

products and services. *Mobile telephony*, *the Internet* and *the broadband* evolved from *readiness* to *diffusion of use*, into its most recent focus: *the impact of use*. This last development phase invited for *innovation* in Internet-carried technologies. Moore's law of "*more power for less money*" had a significant effect on ICT equipment, reducing the price/performance shares. To nourish demand on the consumer side, the prices declined. (OECD Report 2007:5) In 2006, more than half of the Swedish households had broadband access (OECD Report 2007:9). The decrease between income level and personal computer or Internet purchases was fast in Sweden in relation to other OECD countries, where the gap has increased between high- and low-earning groups (OECD Report 2007:31). Sweden had the next-highest percentage of available Internet access (OECD Report 2007:46). By 2007, the speed of the Swedish broadband and ADSL connections had increased a lot, whilst the costs remained mainly the same (OECD Report 2007:52). These socio-economic changes occurred relatively fast and Sweden's digitalization trajectory has thus been one of the most pervasive in Europe, with positive results within information distribution.

During the analyzed period, *newspapers* were the most common Swedish media expenditure, followed by *television*, *magazines*, *the Internet*, respectively *radio*, see Figure A1b in Appendix 1.

Although a middle-earner, the *Internet expenditures* increased 95 percent by 2007 compared to 1998, indicating hence an increasing importance of the digitalization trajectory in the information distribution of the Swedish society:

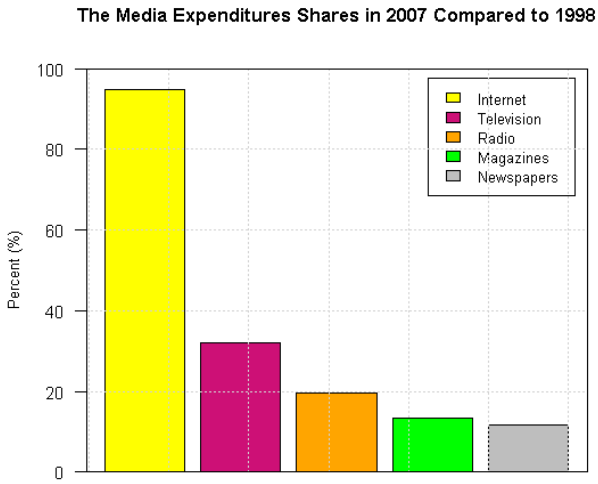

Figure 3.1b *The Growth of Media Expenditure Shares by 2007 in Comparison with 1998 (WARC 2009).*

Compared to 1998, the expenditures for *television* increased 32 percent, *radio* 20 percent, *magazine* 13 percent and *newspaper* 12 percent by 2007. *"The three Cs"*[4], computing, communication and content, are thus vital pillars of the modern information service business activities.

[4] The media convergence phenomenon brings together "the three Cs" into an integrated dimension of publishers, broadcasters, computing and information technology companies and telecommunication networks (Encyclopædia Britannica 2009a).

3.2 Micro-initiated Growth

"At the heart of all strategies lies competitive advantage"

(Porter 1998b:12).

Microeconomic changes focus on the *intra-organizational aspects* (Ahlstrand, Lampel et. al. 1998:237). The growth of businesses is optimally created through *uniqueness* and *quality*. Growth can be *organically* achieved or through *acquisition*, which is rather difficult to attain in small companies. The organic approach argues that the existing resources can be used more efficiently. A more effective management can thus improve the existing processes, services and products. This specializing process is often positively associated with improved economic activity, new distribution possibilities and innovation seizing. Growth and new companies are necessary for employment opportunities, capital and knowledge creation, a healthy concurrency and national tax bases. (Braunerhjelm and Wiklund 2006:11-13)

Corporate entrepreneurship, i.e. *intrapreneurship*, is increasingly recognized as an improving factor within organizational survival, profitability and growth. *Flexibility* offers competitive advantages by allowing small firms to achieve the larger companies' operational potential. An effective *strategic planning* and *entrepreneurial motivation* are believed to improve the likelihood of successful expansions for smaller growing ventures. (Hitt and Ireland 2000:47-57)

3.2.1 The Resource-based View

The *resource-based view* treats the development of new resources through the improvement and exploitation of the existing ones. The efforts of strategic competitive management became apparent during the 1960s, when the firm was placed at the centre of economic analyses. The core tenets of this school of thought are relatively common within entrepreneurial and strategic management research (Davidsson and Wiklund 2000:42). The concepts of *"resource similarity"* and *"market commonality"* were introduced by Chen in 1996 as two important analytical terms within the context of competitive dynamics and multimarket competition (Hitt, Hoskisson et. al. 1999:430). These paradigms are adequate for this study since firms from the same industrial sector share *common factors* upon which their differentiation is built. In this case, the major common development trajectory is the process of *digitalization*. Its evolution resulted in common prosperity determinants such as technological infrastructures, telecommunication and integrated information presentation methods on which the companies capitalize. In the "New Economy", globalization and innovations in information technologies are major driving trajectories (Cummings and Worley 2007:270).

In this paper, the *resource-based view* serves as a connection framework between the assets of the analyzed companies and their management's efficiency. A deepening inference is necessary since the companies are of private type, have no public stock-support and their internal management is therefore sensitive to both financial shortages and macro-economic changes.

3.2.2 Implications of Corporate Development

A company has a "competitive advantage" when its unique strengths, often based on *cost*, *quality*, *time* and *innovation* offers its customers a greater perceived value. It is in such way differentiating itself from its competitors. (Cummings and Worley 2007:4) According to Stevenson and Gupert (1985) entrepreneurship is "the pursuit of opportunities that are beyond the resources controlled currently" (Hitt and Ireland 2000:47). Entrepreneurs must therefore succeed in making the necessary transitions to a professional organizational structure through *equipment*, *employee* and *order management* (Davidsson and Wiklund 2000:38). A simultaneous practice of *adequate decisions* and *technologies* is believed to increase the competitive advantages (Pålsson Syll 2001:162-164). *Technological knowledge* might form the basis of a new market entry or become a source of sustained superior corporate performance (Hisrich, Peters et. al. 2008:467).

Effective production systems are characterized by a higher profit share than the share of resources which are invested. *Productivity*, *quality*, *time efficiency* and *flexibility* are important aspects. The concept of productivity refers to the amount of products or services which are produced per resource unit. Hence, the input must be profitable in relation to the output. (Olsson and Skärvad 2005:121) The concept of quality comprises the quality as perceived by the customers and secondly, the quality of the internal processes. The efficiency of time is often defined in terms of cycle-time, i.e. from the order has been received to the delivered and paid product or service. Flexibility defines the capacity of adapting the production systems to changes. In the long-run, flexibility includes the fast development of new products and services and their optimal integration into the existing or new production systems. (Olsson and Skärvad 2005:122-124)

The main growth-limiting factor is the *entrepreneurial capability* (Lazonick 2005:31). Leadership, the firm and the strategies must be optimally correlated in order to generate growth. The firms' characteristics and growth rates are hence directly related to the leaderships' efforts. (Storey 1994:122-124) Even if revenues theoretically increase to infinity when performance and strategies are optimally aligned, actual firm growth can be restricted. Certain limitation might occur due to the fact that *growth* is restricted by *firm size*, also diminishing the competitive advantages associated with increased *production efficiency*, *attractiveness to suppliers* and *increased bargaining power*. As a company grows, it changes and challenges arise. Common pressures arise therefore on the *financial* and *human* resources, as well as on the managers' *time*. When a company runs short of financial resources due to unexpected expenses, further innovation is hindered and the company becomes vulnerable to external environmental shocks. The management of employees must adapt to all the changes the company encounters, of both physical and strategic type. A high employee turnover due to burnout or diminishing employee motivation can nevertheless affect the company's competitive power if this is based on corporate culture. (Hisrich, Peters et. al. 2008:497-498)

The growth strategies capitalize hence on both the *leadership attributes* and the *firms' knowledge bases* (Hisrich, Peters et. al. 2008:491). The aspirations of a successful manager should inter alia include the overcoming of existing pressures by improving the *financial*, *inventory* and *fixed asset* management. (Hisrich, Peters et. al. 2008:499-505) Since the managers' *time* is limited as well, an effective improvement can be made through the addition of *new resources*, which often is expensive, or by *managing the existing resources more efficiently* (Hisrich, Peters et. al. 2008:498).

Financial control is an important business aspect. The *balance sheet* is one of the useful key financial areas which can be managed and controlled. (Hisrich, Peters et. al. 2008:499) The *assets* repre-

sent everything of value within a business and there are two main categories: *current* and *fixed* assets. The current assets include cash and everything else that can be converted into liquid capital or consumed in the operation of a business within a period of a year or less. *Receivables* or *money* are the most important current assets. The *fixed assets* are tangible and they are often used in the production systems for a longer time. The *liabilities* represent everything that is owed to creditors. The liabilities of maximum one year term are defined as *current* whilst those which range over a longer period of time are *long-term liabilities*. Prompt payment of the liabilities to the suppliers usually aids in generating satisfactory and beneficial relationships with them, whilst it sometimes is better to maintain the available cash holdings in the company for a longer period in order to enhance profit. The payment of liabilities is often delayed during recessions since the managers seek to improve the existing cash flows. This strategy is not always efficient though, since the customers might do the same thing and it then results in no gain or cash advantages. The *owner equity* represents the excess of all assets over all liabilities, i.e. the net worth of the business. A company's revenue increases its assets and owner equity whilst its expenses either decrease its available assets or increase its level of liabilities. (Hisrich, Peters et. al. 2008:300-302)

Binding of capital, idle resources and locking of resources act negatively on the *accessible cash holdings*. The *profitability* of a company is therefore highly dependent on the generated *profit* and *internal capital binding*. (Olsson and Skärvad 2005:358) The higher the profit and the less capital which is bonded in the current and fixed assets, the higher is the profitability level of a company (Olsson and Skärvad 2005:359). The *management of receivables* is of outmost importance due to the fact that the longer the time it takes for the customers to pay their bills, the greater financial stress is placed on the *cash need* of the business (Hisrich, Peters et. al. 2008:301). The *cash liquidity* is nevertheless important in determining the short-term solvency of the company or its ability to meet its current debts. The short-term liabilities must be covered from *cash* or *equivalents* in order to eliminate further borrowings and debts. (Hisrich, Peters et. al. 2008:391)

Bad liquidity is a common reason of companies' bankruptcies. If a company's *liquidity* diminishes, it is of great importance to identify its cause. When a company's liquidity diminishes, common reasons are the *configuration of its inventory*, *investment increases* or great *capital withdrawals*. When a company continues to produce on basis of its inventory due to lower demand, it can still have a high liquidity level. But bankruptcies occur often in companies with high liquidity levels when their inventory cannot be sold and their payment capacity becomes weak. (Olsson and Skärvad 2005:373)

Solidity defines a company's capital strength, i.e. its ability of paying its long-term debts (Olsson and Skärvad 2005:357). Common reasons of bad solidity are heavy *expansions* and *investments* with *foreign capital* (Olsson and Skärvad 2005:377). The companies' capital structure can be risky for its creditors at high debt levels and can affect its *creditworthiness* negatively. Therefore, for a company to be considered profitable, the *investors' share* (equity) of capital should be relatively high. (Hisrich, Peters et. al. 2008:392) The *return* and *debt to equity* shares are extremely important in the case of the analyzed companies since they are of *private joint-stock type*. They have no rapid external financial possibilities, unlike public joint-stock companies. The shareholders must hence mainly relay on the *internal management* for profitability.

In order to achieve higher *capital efficiency*, a business should apply to *cash management*. This approach often emphasizes the main current assets *customer receivables* and *inventory* minus the current liabilities *accounts payable*, referred to as the *working capital*. The scope is to optimize the

company's *order-related activities* and its *administration of liquid assets* and *short-term debts*. (Olsson and Skärvad 2005:303-304) In liquidity aims, the working capital of a company is recommended to follow a certain share of its turnover and this should change in agreement with the changes in turnover (Olsson and Skärvad 2005:372).

The *management of inventory* is of equal importance within the practiced financial management, especially if the company is in a growth phase. Growing companies usually tie up a consistent amount of cash in their inventory, which can be risky. Too little inventory can also result in failure to meet the customers' demand and costs due to lost sales. (Hisrich, Peters et. al. 2008:500)

The *"Cash-to-cash"* model defines the activities which deal with efficient delivery and work management systems. It measures the time it takes for a company to convert the collected payments from the customers into cash dedicated to finance their suppliers. It is a measure of the working capital efficiency as a sum of *days cost-of-sales in inventory* and *days sales in accounts receivable* less the *days purchases in accounts payable*:

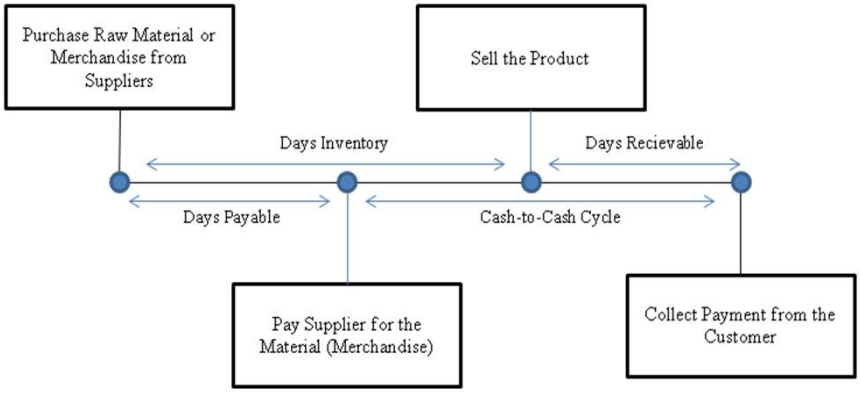

Figure 3.2.2 *The Cash Conversion Cycle (Kaplan and Norton 1996:58).*

Although some companies work with negative cash cycles, i.e. pay the suppliers after they collect the money from the customers, an efficient cash cycle management can supply capital to the day-to-day operating cycle instead of consuming it. Inventories can be matched extremely close to sales day, short-term collections can be practiced in customer payments and favorable negotiations can be made with the suppliers. (Kaplan and Norton 1996:59)

A company's *investment level in technology* is expected to be value-adding, as the *fixed capital* is part of the financial management. *Technology* is defined as "the body of knowledge and techniques which can be used to combine economic resources to produce goods and services" (Cummings and Worley 2007:20). The fixed assets' purpose is hence to increase the efficiency of the production systems and *investments in upgrades* and *innovation* are therefore expected to be beneficial for profitability. Furthermore, information systems are indispensible for financial and marketing control in growth phases (Hisrich, Peters et. al. 2008:506). In this study, a positive relationship is expected between the firms' competitive power and their adaptability to digitalization. Internally, *digitalization* is considered to be a catalyst of the corporate investments. The concept of *competitiveness* refers to characteristics which allow a company to compete successfully on basis of low costs or superior technology (Cummings and Worley 2007:142).

The *management of fixed capital* involves a long-time commitment and large investments, as the fixed assets are associated with *costs* and become *deprecated* after a period of time. If the company cannot afford to buy equipment and fixed assets, leasing might be a good alternative. (Hisrich, Peters et. al. 2008:503-504) The *gross fixed capital formation* process represents the *fixed capital assets* minus the *long-term liabilities* of a firm (Central Swedish Logistics 2007). Since the employed annual reports use the elder accounting standard, the *intellectual property capital* is contended in the fixed capital asset measurement and includes the companies' innovative aspirations.

4 Methodology

This chapter treats the master thesis' *elaboration process*. It describes the *data collection process*, the *conceptual model* and presents discussions of the *research methods' statistical significance*. Lastly, the data and empirical methods' *reliability* and *validity* to the research topic are discussed.

The *research methods* and *data* are combined in agreement with the *case study* praxis. I selected the case study approach since it is suitable for contemporary business and management studies (Remenyi, Williams et. al. 1998:167). Bell's (1993) definition of the case study approach is "an umbrella term for a family of research methods having in common the decision to focus on an enquiry around a specific instance or event" (Remenyi, Williams et. al. 1998:165).

The determination of *causality* is hence supported through several research methods: *description, analytical evaluation, classification, quantification, comparison, correlation* and *reflective sequences*. The computer-aided tests comprise common *statistical tests*, based on *univariate* analyses applying the comparison of mean values, as well as *bivariate* analyses of correlation aimed to define the key measurements' contribution strength to the outcome, the *profitability per employee*. The computations are mainly performed in *R* of The R Foundation for Statistical Computing, which is free software.

4.1 Data Collection

The consulted *theory* and *data* are related by mutual relevance since empirical constructs necessitate relevant information in order to be justified. The data is considered irrelevant if it lacks connection to the used theoretical framework (Remenyi, Williams et. al. 1998:32).

Searches for suitable data were performed at academic libraries, censuses, digital archives and major databases. Both licensed and free information sources were consulted. The selected microeconomic data are licensed material collected by *Affärsdata*, suitable for academic studies even if they are of secondary type. The data are trustworthy since they are *annual reports*, written by accountants. They offer a standardized survey over the firms' investments, assets and liabilities and are hence suitable for the purported external financial analysis.

Nine Stockholm-based *joint-stock* companies of *private* type could be selected. The data range over ten years, from 1998 to 2007. The effects of the modern digitalization are thus contended and the fact that the *"dot-com" crisis* shook the economy offers a great opportunity of analyzing particular businesses' *consequences* and *stability factors* up-close. They were nevertheless selected since are from *the same region*. Their differences constitute an opportunity of analyzing their efficiency under similar possibilities and in the same environment. Even if the modern business transactions are not restricted to the local arena, the existing commonalities of selection increase the possibility of emphasizing their differences. I believe that the digitalization trajectory has improved production and nevertheless increased the opportunities of differentiation in business.

The macroeconomic data were gathered from *Statistics Sweden*, *Bolagsverket*, *The World Media Research Center* and *The Organization for Economic Development*. Nevertheless, this study contains information from adequate *books*, *articles* and the companies' *web sites*. The companies were also directly contacted in order to answer a topic-specific *qualitative survey*.

4.1.1 Survey

The selected companies were contacted per *telephone* and the *survey* was *mailed out* in order to provide this study with primary data. The questions aimed to reveal the companies' opinions about the dot-com crisis' consequences on their profitability, as well as other interesting managerial factors. The survey can be found in Appendix 2.

The response frequency was low, in spite of the fact that two reminders were mailed out and that the companies were contacted per telephone at least twice. Only one company contributed with primary information, Softronic Enterprise Partner Ldt.

4.1.2 Data Sampling

The companies were first sorted by their *SNI code*, 63110 (*data analysis and web hosting*) and *location*, Stockholm. Secondly, they were uniform in *type*: private joint-stock. Private joint-stock companies have a capital requirement of 100 000 SEK (Nutek's Corporate Guide 2009).

Third, only the companies which had *annual reports* available for the selected decade were chosen. All observations were thus registered at *balanced time points* and contain *no missing values*: t_1=1998, t_2=1999, t_3=2000, t_4=2001, t_5=2002, t_6=2003, t_7=2004, t_8=2005, t_9=2006 and t_{10}=2007.

Fourth, only companies which *employed personnel* were kept. This fact is of importance for the calculation of the purported key terms, since they are calculated per employee in order to eliminate bias and offer a robust measurement unit.

Fifth, the companies were reconsidered on basis of their *sizes*. The European Commission distinguishes between micro, small, medium-sized and large companies. Firms with less than 10 employees are of micro type, less than 50 are small, less than 250 are defined to be medium-sized and firms with more than 250 employees are large (European Commission 2009).

The most homogenous selection available was in the range of 1 to 52 employees. This study includes thus micro, small and medium-sized companies. The sole large company which was a potential choice was hence excluded on basis of underrepresentation. During the analyzed decade, the most common Swedish companies were of micro and small sizes:

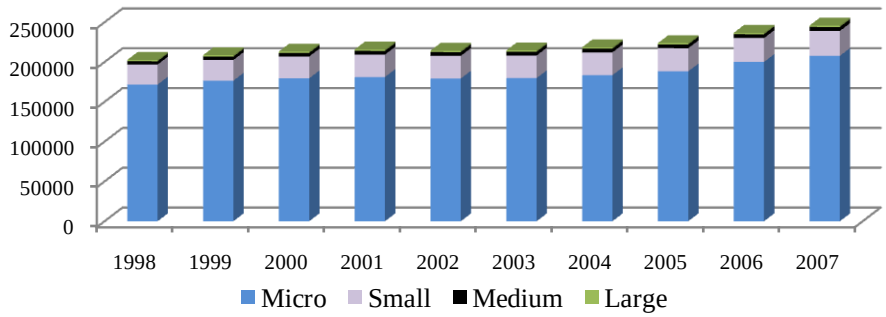

Figure 4.1.2 *Swedish Companies per Company Size 1998 to 2007 (Statistics Sweden 2009d).*

Nine companies matched all the requirements and five were totally excluded from the original sample on basis of poor representation of the requirements.

4.1.3 Dataset Description

Table 4.1.3 presents the main descriptive statistics of the dataset, see Appendix 3. Firm size does not bias this study's results since the companies' achievements are compared *per employee*.

Variable	Min.	Mean	Max.	Median	Observations
Employees	1.00	**9.22**	52.00	7.00	90
Women	0.00	**4.14**	21.00	2.00	90
Men	0.00	**5.08**	31.00	3.00	90
Profitability per Employee (%)	-34.05	**1.99**	30.14	1.20	90
Return on Equity (%)	-99.00	**2.00**	39.00	2.00	90
Debt to Equity (%)	-29.00	**74.00**	685.0	32.00	90

Table 4.1.3 *Descriptive Statistics of the Dataset.*

Figure 4.1.3a presents the distribution of the dependent variable *profitability per employee*:

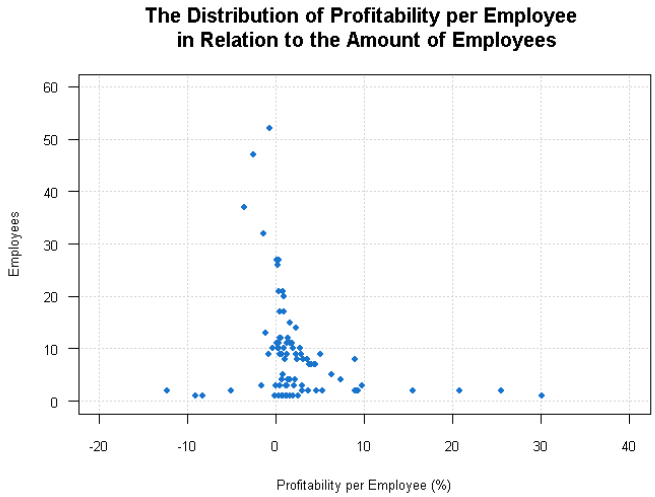

Figure 4.1.3a *The Profitability per Employee of the Company Types in Relation to the Amount of Employees between 1998 and 2007 (See Appendix 3).*

Figure 4.1.3b presents histograms of the dependent variable *profitability per employee* and of the companies' *size* distribution:

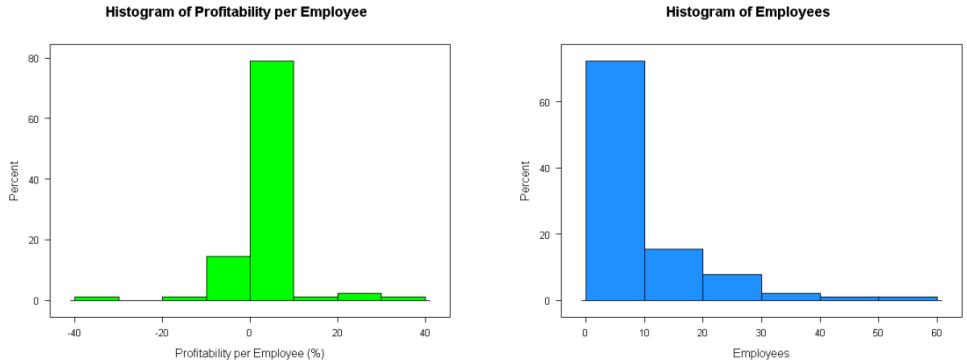

Figure 4.1.3b *Histograms of the Dependent Variable Profitability per Employee and of the Average Amount of Employees in the Dataset (See Appendix 3).*

4.2 The Conceptual Model

The companies' development and economic[5] profitability is *externally* analyzed in this paper. *External financial analyses* use public data, such as annual reports (Olsson and Skärvad 2005:354). Joint-stock companies have the most detailed accounting declaration requirements (Thomasson 2007:223). The gathered economic *key factors* describe hence the revenue-generating process of the companies in *common accounting measurements* and define the diverse input factors' contribution to the output, their *profitability*. The companies' annual reports serve hence to determine the efficiency of management in agreement with the theoretic study.

The applied research techniques are *descriptive* and aim to reveal commonalities and differences in the companies' realizations on basis of the discussed theoretical foundation.

The first section discusses the *process of elaboration*. The *key variables* and the *hypotheses* are discussed next and the last section treats the *statistical significance* of the considered analyses.

4.2.1 The Process of Elaboration

The elaboration process consists of empirical analyses of both *qualitative* and *quantitative* type.

Qualitative support is first provided through the survey, the annual report declarations and the companies' web sites and other relevant publications.

In the subsequent *quantitative* profitability analyses, the importance of the companies' assets is emphasized in order to define their differences at *different profitability levels*. The companies' mean achievements are first compared in order to define each factor's influence upon the level of profitability. Secondly, the components of financial management are analyzed in relation to the turnover in a cash management analysis. Thirdly, the measurements' profitability is defined in relation to the total assets. The key measurements' significance is lastly determined by means of correlation tests and two-tailed tests of significance at the 99 and 90 percent confidence levels.

The variation of the key measurements is next *longitudinally* analyzed in three different periods of interest: before, during and after the "dot-com crisis". It can hence be determined which of the measurements were more intensive and characteristic for which period.

The *analyses' results* are lastly discussed through the theoretical perspective and the hypothetical support is stated on basis of the empirical findings.

4.2.2 Microeconomic Key Variables

The *variables* are hereby presented in agreement with the theoretic study of section 3.2.2. The *hypotheses* are theoretically-derived and are presented along with the relevant key measurements.

[5] The term "economic" refers to the companies' efficiency of managing their resources and is measured in money-based financial units (Olsson and Skärvad 2005:354).

1. *Profitability*

This analytic measurement purports to determine if the profit generated by a company's activities is satisfactory (Olsson and Skärvad 2005:358). The measurement is suitable for corporate comparisons and is here used to define the companies' relative *competitive ability*.

Profitability is measured as yield on total capital (Olsson and Skärvad 2005:360):

$$R_t(\%) = \frac{operating\ results\ per\ employee + financial\ income\ per\ employee}{average\ total\ assets\ per\ employee} * 100.$$

The operating result per employee is a measure of deficit or surplus which results from production. It represents the *business income* after subtracting the *operating expenses* from the *operating income*. The measurement of profitability indicates thus the relation between a company's *operating* and *financial incomes* and its *average total assets*. The measurement of *average total assets* represents the available resources which a firm holds as an average value of the current and previous year's achievements (Olsson and Skärvad 2005:361). This profitability measurement is the *dependent variable* of the main analysis and represents the management's ability of leading successfully.

The following variables are representatives of the managerial aspirations of leading efficiently and are all *independent contributors* to the managerial realizations.

2. *Return on Equity*

The *return on equity* measurement defines the ability of a company to generate return to the stockholders (Hisrich, Peters et. al. 2008:392):

$$return\ on\ equity\ (\%) = \frac{net\ results\ per\ employee}{shareholders'\ equity\ per\ employee} * 100\ .$$

Hypothesis:

1) *A high return on equity per employee is a proper indicator of a company's ability of generating return to its stockholders. This measurement indicates opportunities of future external negotiations and investments, of growth through acquisition and improvement of the public image.*

3. *Leverage*

The *debt to equity* measurement indicates if a company was financed through debt or had a relatively high own equity share and hence a low leverage level (Hisrich, Peters et. al. 2008:392):

$$debt\ to\ equity\ (\%) = \frac{total\ liabilities\ per\ employee}{shareholders'\ equity\ per\ employee} * 100.$$

Hypothesis:

2) The leverage share of a company is negatively related to its profitability. A low debt to equity percentage increases its creditworthiness and long-term development. Small firms might not have

the creditworthiness of larger companies and this factor might improve a small company's long-term prosperity when assessment of external financing is difficult.

4. *Working Capital*

In cash management analyses, the *working capital* share is calculated as the current assets minus the current liabilities (Olsson and Skärvad 2005:304). In order to relate the companies' *time efficiency* to the level of profitability, the working capital will be defined as:

$$working\ capital\ (\%) = \frac{current\ assets\ per\ employee - current\ liabilities\ per\ employee}{turnover\ per\ employee} * 100.$$

A company's *need of capital* tends to vary proportionally with its turnover and therefore, the "percentage method" is suitable to define the working capital share of the achieved turnover (Olsson and Skärvad 2005:304):

capital need = accounts payable + inventory – accounts receivable, as percentages of *turnover*.

Hypothesis:

3) The working capital is negatively related to the level of profitability since it is a resource currently employed in the companies' cash management and when the cash holdings at disposal are too high, they become risky.

5. *Liquidity*

Liquidity is a measure of a firm's capacity of paying its liabilities (Olsson and Skärvad 2005:357). The available liquid assets and expected incomes must cover the corporate expenditures (Olsson and Skärvad 2005:371). A *deepening liquidity analysis* is therefore performed in order to state the impact of the subsequent financial measurements upon the levels of *cash* present in the companies.

The most liquid of the current assets are the ones the fastest accessible and are calculated as:

$$liquid\ cash\ (\%) = \frac{cash\ and\ bank\ balance\ per\ employee}{total\ assets\ per\ employee} * 100.$$

This variable is the dependent variable of the deepening liquidity analysis. The relevant *independent variables* are discussed next.

The *current liabilities* are associated with a short-term risk of cash locking and large amounts of cash lying idle in order to finance them. A too large amount is therefore believed to affect the levels of liquid assets negatively. The short-term capital risk is hence calculated as:

$$existing\ short\text{-}term\ cash\ risk\ (\%) = \frac{current\ liabilities\ per\ employee}{total\ assets\ per\ employee} * 100.$$

In order to define the impact of the *long-term liabilities* upon the held cash levels, they are calculated as:

$$long\text{-}term\ capital\ risk\ (\%) = \frac{long\text{-}term\ liabilities\ per\ employee}{total\ assets\ per\ employee} * 100.$$

The *fixed capital assets'* impact on the liquid assets is calculated as follows:

$$fixed\ capital\ assets\ (\%) = \frac{fixed\ capital\ assets\ per\ employee}{total\ assets\ per\ employee} * 100.$$

The companies' *cash conversion cycle* is nevertheless of importance to the level of liquid assets of a company. This measurement unit is calculated as (Kaplan and Norton 1996:58):

cash-to-cash cycle = days sales outstanding + days sales of inventory - days payable outstanding.

The "*Days Sales Outstanding*" measurement defines the period of days receivable, i.e. the days until the payment is collected from the customers (Berman, Knight et. al. 2006:167):

$$days\ sales\ outstanding = \frac{accounts\ recievable\ per\ employee}{turnover\ per\ employee}/365\ .$$

The "*Inventory Turnover*" measurement measures the efficiency of managing and selling the inventory. A very high turnover rate might result in under-stocked companies and lost orders, but a high turnover is generally a sign of an efficient management (Hisrich, Peters et. al. 2005:391):

$$days\ sales\ of\ inventory = \frac{cost\ of\ goods\ sold\ per\ employee}{inventory\ per\ employee}\ /365\ .$$

The *costs of goods sold per employee* will be calculated as (Fridson and Álvarez 2002:169):

cost of goods sold = net turnover per employee - EBITDA per employee,

where EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) represents the operating results, excluding the interest income and expenses, income taxes and the depreciation and write-offs of tangible and intangible assets. This measurement takes into account the depreciations and amortizations as *accruals*, not expenses, as they are a value which is rightfully assigned to equipment, machinery and property. It is hence more discriminating in comparison with the plain EBIT (Earnings before Interest and Taxes). (Fridson and Álvarez 2002:166-168) Nevertheless, the EBITDA measurement allows for differing depreciation policies of the companies and still returns an accurate comparison base of credit risks (Fridson and Álvarez 2002:172).

Likewise, the "*Days Payable Outstanding*" measurement calculates the average amount of days it takes for a company to pay its outstanding invoices (Berman, Knight et. al. 2006:168):

$$days\ payable\ outstanding = \frac{accounts\ payable\ per\ employee}{cost\ of\ goods\ sold\ per\ employee}/365\ .$$

Hypotheses:

4) Current liabilities are negatively related to a company's liquid cash holdings since they tend to enhance the risk of resources laying idle instead of being allocated into further development.

5) Long-term liabilities are negatively related to a company's liquid cash holdings since they cause financial stress such as lower credit credibility and diminish the chances of obtaining external capital for major investments.

6) The fixed capital assets are negatively related to the levels of liquid cash holdings, as they are short-term expenses although they are long-term investments as well.

7) The amount of cash conversion cycle days are negatively related to the level of liquid cash holdings. A short cash-to-cash cycle improves a company's profitability through a positive image to suppliers and higher efficiency of customer and inventory management with fewer resources laying idle.

8) The primary cash substitute, accounts receivables, is positively related to a company's liquid cash holdings since they are the most efficiently transformed into cash.

9) The secondary cash substitute, the inventory, is positively related to the existing liquid cash holdings since it can be transformed into cash when the working capital management is efficient.

10) The accounts payable are negatively related to the liquid cash holding levels. These are obligations which must be accounted for in time in order to create a serious impression and obtain partnership benefits from the suppliers.

6. *Adaptability to Digitalization*

The companies' *gross fixed capital formation* process is an important contributor to the Swedish gross domestic product. Therefore, this deepening analysis focuses on their adaptability to digitalization as contributors to the national economic treasury. This part of the analysis defines hence the impact of the *fixed capital assets*, *investments* and *sales*, *depreciations* and *long-term liabilities* upon the *gross fixed capital formation* process. The measurements will be analyzed in relation to the total assets per employee.

The *gross fixed capital formation* is calculated as (Central Swedish Logistics 2007):

gross fixed capital formation = gross fixed capital stock - long-term liabilities,

whilst the *gross fixed capital investment* is calculated as:

gross fixed capital investment = accumulated depreciation carried forward + depreciation - opening accumulated depreciation.

Hypotheses:

11) The gross fixed capital assets are positively related to a company's gross fixed capital formation, in such way that the effects of labor and entrepreneurship are enhanced. They are short-term expenditures but long-term investments.

12) The long-term liabilities are negatively related to the level of gross fixed capital formation in such way that they might lock material resources.

13) The fixed capital investments are positively related to the gross fixed capital formation level since they promote a company's technological development.

14) The level of depreciation is positively related to the level of gross fixed capital formation, since they are nurturing innovation and management efficiency.

15) The fixed capital sales are positively related to the gross fixed capital formation, as they unlock resources and promote innovation in the production systems. They are positively related to the level of depreciations but negatively related to the levels of fixed capital investment in the short-term, since they are often used to finance existing technological payments.

4.2.3 Statistical Significance

Correlation is an important aspect within statistics. The higher the correlation between two variables, the higher the chance that they have a valid relationship, given that there also exists a reliable logic connection between them. *Causality* is here an important aspect, as the production inputs are considered to be causes of the output, the achieved profitability.

The *goodness of fit* of the variables' relationship is measured through *r,* the Pearson correlation coefficient. *The adjusted* r^2 is the *r* squared and measures the relationship by imposing small penalties for additional regressors, defining irrelevant ones. (Adkins and Carter Hill 2008:141-142) The statistical significance is tested with two-tailed significance tests at the 99 and 90 percent of statistical accuracy and the correlations are presented in terms of r^2.

Hypotheses can be regarded as "scientific" if they cannot be falsified in analyses (Remenyi, Williams et. al. 1998:283). In order to be considered significant, the findings must hence be supported by both the computer-aided tests and the reflective sequences.

4.3 Reliability

Reliability is "the degree to which observations or measures are consistent or stable" (Remenyi, Williams et. al. 1998:289). This section treats the techniques which are used to provide a reliable support for this study and the elimination of bias in the results. Since the data is mostly of secondary nature, reliable judgments were ensured through the authenticity degree of the selected sources. The used sources' suitability was also considered after their actuality level. The selection of the companies was made in agreement with the practiced industrial SNI code and geographical location. The survey contended the same questions for all the firms and was designed to underpin aspects of major interest for this study.

The applied sampling technique assures the datasets' compatibility and enhances the computational accuracy. By applying both the qualitative and quantitative research approaches, the analytic perspectives are enhanced. Loveridge (1990) defined *the triangulation concept* as "using multiple methods to capture a sense of reality". In business and management research, triangulation is associated with the inclusion of multiple sources, in order to hinder the biasing of results which the single informative sources are associated with. (Remenyi, Williams et. al. 1998:142) The depth of enquiry is significantly greater when information convergence is identified.

The degree of *uncertainty* in the results is nevertheless reduced through the appliance of common statistical tests. In order to exclude the unknown parameter of *firm size,* the measurements are pre-

sented per employee, ensuring hence a reliable comparison method of the companies. The analysing techniques are chosen due to their efficiency of testing small datasets, supporting thus a high computational accuracy. To offer a trustworthy linkage of the theory to the data, scientific quality is solely stated when the tests indicate accurate results and null hypotheses can be rejected on basis of poor statistical support.

The dataset was *inflation-adjusted* in order to provide a reliable statistical support for the upcoming analyses. The rates are calculated in agreement with the average annual inflation rate and the monetary value of 1 Swedish Crown in September 2009:

Year	Value of 1 SEK in September 2009	Change Rate (%)
1998	1.17	16.89
1999	1.16	16.33
2000	1.15	15.20
2001	1.12	12.46
2002	1.10	10.09
2003	1.08	8.00
2004	1.08	7.60
2005	1.07	7.10
2006	1.06	5.68
2007	1.03	3.39

Table 4.3 *Inflation-adjustment Rate of Monetary Value in Relation to September 2009 (Statistics Sweden 2009e).*

4.4 Validity

Validity is "the degree to which what is observed or measured is the same as what was purported to be observed or measured" (Remenyi, Williams et. al. 1998:291). The annual reports offer adequate economic key measurements, whilst the theoretical foundation underpins their relevance. Nevertheless, the survey aims to reveal individual information regarding the research topic.

5 Empirical Analysis

In this chapter, an agreement is sought between the discussed theory and the empirical data. The chapter begins with a *short description of the companies' achievements* and a discussion of the applied analytic *classification*. The companies are thereafter *qualitatively* analyzed and presented, along with the results of the survey and information from relevant web pages and articles.

In the first section, the variables are *quantitatively* analyzed in-depth, in order to state the key measurements' statistical significance to the companies' profitability and distinguish between the successful and unsuccessful managerial factors. The second section of this chapter treats the changes of profitability longitudinally and defines their differences before, during and after the dot-com crisis. The last section analyzes the empirical results in relation to the theoretical assumptions and discusses the identified hypothetical support.

The companies are hereby ranked in descending order by their achieved *profitability per employee* and divided into three bins containing three companies each:

Company Name	Profitability per Employee (%)	Average Employees	Terciles
1. ITC Infotel Communications	8.90	3.40	
2. Svensk Adressändring	5.02	6.40	Tercile 1
3. GS1 Sweden Services	2.05	10.60	
4. Föreningshuset SEDAB	1.41	3.60	
5. Galileo Nordiska	1.06	12.80	Tercile 2
6. Softronic Enter	0.51	11.20	
7. Grammotex Data	0.02	1.70	
8. Spannet Data	-0.43	1.00	Tercile 3
9. Interoute Managed Services Sweden	-0.66	32.30	

Table 5 *Ranking of the Companies in Descending Order by Profitability per Employee.*

The first tercile contains thus the companies with the highest level of average profitability per employee, whilst the third tercile contains the companies with the smallest average levels of profitability per employee. This classification method allows hence for an in-depth analysis of the diverse key measurements at three different profitability levels.

Tercile 1

1. **ITC Infotel Communications** employed an average of 3.4 employees, 2.7 women and 0.7 men. This company offered telecommunication services (Annual Reports 1998 to 2007). Its specialization was within the domain of audiotex, with a focus on voice response and call centers. The company nevertheless offered corporate management of technological platforms, as well as customer support to its clients. (Infotel 2007)
2. **Svensk Adressändring** employed an average of 6.4 employees, 1.9 women and 4.5 men. This company managed and supplied a computer-based system for address changes and forwarding of post and parcels, as well as storing of physical items of mail for private persons and companies. It also managed announcements of removal, reclamations and inspected the addresses of private persons and companies. During 1998, it became possible to announce removals through the Internet. (Annual Report 1998) In 1999, the company continued to improve its IT-system, considering it increasingly central for its existence. It became possible to confirm announcements of removal online

for certain cardholders and information about removals of students was supplied to Student Unions. (Annual Report 1999) During 2000, the IT and web systems' operability was extended with a web-based account receivables ledger system (Annual Report 2000). In 2001, the sister corporation AddressPoint was founded and started operating within distribution of mail items and IT activities (Annual Report 2001). During 2002, the customer service was outsourced but the existing business logistics, database management and data production were kept in-house. Resources were devoted to improving the file delivery system and the web site was given a new layout. The company was chosen as the most user-friendly web site in the Web Service Award's customer survey. (Annual Report 2002) In 2003, the development of applications was outsourced. The aim was to follow the corporate policy and diminish the expenses associated with production. Svensk Adressändring remained responsible for the business logistics and database management. (Annual Report 2003) During 2004, the development of the IT system continued and the possibility of direct payment through the Internet was introduced (Annual Report 2004). In comparison with 1998, the address removal announcements made through the Internet increased from 1.1 percent to 58 percent in 2007. (Annual Reports 1998 and 2007)

3. **GS1 Sweden Services** employed an average of 11 employees, 4 men and 7 women. This company's initial innovation of improving business systems, the bar code/EAN-code, evolved into a standardized digital integrated system of tracing products on basis of radio frequency identification. The standard is now called EPC (Electronic Product Code) or GS1 System. This improvement nevertheless allowed for more effective analyses of the routes which the products and articles took, allowing for continuous adaptation. (GS1 2009) Information technologies were emphasized as the solution of handling management systems independent of industrial area and the solutions were license-based. Similar solutions existed for the transport industry, the book trade and workshops. (Annual Report 1998) During 1999, the system extended into the governmental organizations, municipalities and county councils (Annual Report 1999). During 2000, even the meat could be traced from animals to consumers, in a coordinated system of packaging (Annual Report 2000). E-numbering of companies on basis of their organizational number was developed in 2001 and a standard of harmonization was initiated for the Nordic trade of goods (Annual Report 2001). In 2002, plans existed for implementing similar solutions within the Western healthcare (Annual Report 2002). In 2005, the innovations were extended with consultancy services and information technology systems which applied pooled data management (Annual Report 2005).

Tercile 2

4. **Föreningshuset SEDAB** employed an average of 4 employees, 2 women and 2 men. This company conducted corporate computer-based service activities (Annual Reports 1998 to 2007). Its specialization has been fee debiting since its start in 1972. It subsequently offered web-based administrative solutions of membership and other association-related activities in the scope of facilitating their customers' focus on their members. (Föreningshuset 2009)

5. **Galileo Nordiska** employed an average of 13 employees, 7 women and 6 men. This company marketed, sold and distributed the global reservation system Galileo to travel agencies in Sweden, Norway and Finland (Annual Reports 1998 to 2000). When the "dot-com bubble" burst, the travelling agency domain was negatively affected. Furthermore, the terrorist act on the 11th of September 2001 affected the businesses negatively, since the travelers became afraid to fly. (Annual Report 2001) Even if these events had consequences during 2002 as well, the company continued to invest in local products and services (Annual Report 2002). During 2003, an organizational change was

initiated, aimed to develop the cooperation and define synergy-effects between the company and its sister company, owned by Cendant. (Annual Report 2003) During 2004, the main strategic focus lied on developing an integrated product portfolio, in order to take advantage of Cendant's e-booker system and become the second major supplier of reservations within the travelling domain. (Annual Report 2004) In 2005, the new collaboration with Travelstart offered Galileo Nordiska another entrance within Internet-based travel bookings. Internally, these organizational improvements resulted in well-ordered processes, new employees and a more efficient customer relations management. (Annual Report 2005) In 2007, Galileo International's profits per transaction diminished. This issue was resolved through new customer bases which their new partners offered. Nevertheless, the internal strategic change diminished the costs and compensated in such way for the transaction shortages. This same year, Galileo nordiska's parent company, Travelpc, acquisitioned its competitor global reservation system Worldspan and brought in such manner both these companies' sales activities under the same corporate roof. (Annual Report 2007) It now delivers travel systems which have access to global information, which is a necessity in the modern travelling (Galileo Nordiska 2009).

6. **Softronic Enter** employed an average of 11 employees, 8 men and 3 women. **Mikael Niva**, Sales Manager at Softronic Enterprise Partner Ldt. answered the survey. The questions can be found in Appendix 2. The digitalization process is of outmost importance for the corporate development in his opinion. The Softronic Enterprise Partner is a subsidiary which focuses on developing system-based solutions and consulting services for the Nordic insurance and financial market. After deliverance, the company offers operational and maintenance services, with a focus on long-term relationships. (Softronic 2009) A combination of new thinking within the high-technological domain, experience and strategic business knowledge in the development of the products and services of this company helped them win the Microsoft .NET award during three subsequent years. Nevertheless, the company had a Gold Certified Partner contract with Microsoft. (Softronic Enterprise Partner 2009) In **Mikael Niva**'s opinion, Softronic Enterprise Partner is the result of digitalization in modern technological solutions and has definitely been adapted to the occurring techno-societal changes. Furthermore, he believes that it is of importance to be up to date with the digitalization trends of the surrounding business environment. The Internet is a very profitable technological factor for the success of this company. Both recruitment and outsourcing of technological services occur. Training of the personnel is practiced and the training occasions focus on both internal and external business aspects. An ergonomic working environment is highly prioritized and subsequent efforts have been made to improve it. The corporate information technologies are green technology and take into account the existing regulations for a cleaner environment, through constant awareness. The corporate intranet is perceived to be profitable and efficient, just as their web site. The company also has a customer-dedicated web-based system, through which the production flow has been improved. The company offers customer training and support. The gathered feedback is used for further improvement and strategic development. Marketing and the distribution of information is performed both by the company itself and by hired media companies. Future plans for technological investments exist and this is a constantly on-going activity. The geographical location offers Softronic Enterprise Partner proximity to 95 percent of its Swedish customers. Profitability is also improved by the fact that the company has business units in the whole country. (Niva 2009) In conclusion, his response supported the main belief of this master thesis, cf. section 1.2. A company's profitability depends on the practiced management and performed investments. The presented technological innovations which resulted from a conscious management brought this company success and adapted solutions to the difficult times of the crisis and its consequences.

Tercile 3

7. **Grammotex Data** employed an average of 2 employees, 1 man and 1 woman. This record company supplied digital information, sales and order systems for phonograms. During the decade, its database grew larger and the company shifted from modem-based delivery to IP-based delivery of products. It published the official list of sold hits in Sweden and had more than 110000 articles ready for delivery to its suppliers by 2007. (Annual Reports 1998 to 2007) In 2004, the magazine Private Business wrote an article about an innovation which Grammotex Data was planning. The system Grammocert was designed to meet the changed requirements of the music industry and deliver through digital downloading in addition to its traditional catalogue services. This record company was owned by the Gramophone Suppliers Association. Membership within this association offered Grammotex Data partnership with other important music distributors such as Bonnier Music Group, BMG, EMI, Sony Music, Universal and Warner Music. (Privata Affärer 2004) By 2007, its database articles were digitally delivered to all customers shops (Annual Report 2007).
8. **Spannet Data** employed an average of 1 employee, a man. This company conducted consultancy and software development services within the domains of trade, sales and administration of securities. It also managed imports and wholesaler sales of equipment and clothing within golf and skiing. (Annual Reports 1998 to 2007)
9. **Interoute Managed Services Sweden** employed an average of 32 employees, 19 men and 13 women. This company produced, sold and developed services and goods within computer, networks and telecommunications, as well as information services and publishing. (Annual Reports 1998 to 2000) In 2001, the Gothenburg and Stockholm offices were consolidated within the capital (Annual Report 2001). In 2002, the organizational development continued and new powerful customers such as Expressen, Volvo CE and The Gulf Agency, were served (Annual Report 2002). During 2003, new services were implemented within Asymmetric Digital Subscriber Lines, NetSecurity Suite for firewalls, virtual private networks and the transfer of video and telephony services (Annual Report 2003). In 2004, an Order Management Team was established in order to coordinate orders and requests for international deliverance. The greatest investment was made within the network's speed, which could manage 10 gigabits per second. (Annual Report 2004) In 2005, new services were implemented within the domains of Hosted Exchange and IP-based telephony. Internally, an extensive project was launched in order to improve the distribution of information and leadership at all levels. (Annual Report 2005) During 2006, the need for consultancy service increased. A Russian plant was harvested and the resources were allocated to the Swedish organization. (Annual Report 2006) During 2007, the company was bought by Interoute Communications Ltd., one of the greatest voice and data suppliers within Europe and North America (Annual Report 2007). The company was nevertheless awarded with a "Triple-A diploma" for its solidity level, ranking it as highly creditworthy (Interoute Managed Systems 2009).

5.1 Quantitative Analysis

The empirical data is hereby analyzed in order to verify the theoretical correspondence of the key measurements defined in section 4.2.2. The applied analyzes are of both *univariate* and *bivariate* type: comparison of mean values and correlation analyses with two-tailed significance tests at the 90 and 99 percent accuracy levels.

Table 5.1a presents the terciles' main key measurements per employee:

Variables	Tercile 1	Tercile 2	Tercile 3
Profitability (%)	**5.32**	**0.99**	**-0.36**
Debt to Equity (%)	81.12	115.85	26.23
Return on Equity (%)	8.90	1.24	-3.23
Working Capital/Turnover (%)	6.95	8.20	14.19

Table 5.1a *Main Profitability Analysis (per Employee).*

The *profitability per employee* was the main criteria of division into the three terciles, cf. section 5. The first tercile contains hence the three most profitable companies whilst the third tercile comprises the three least profitable ones. Given the results presented in Table 5.1a, it can be stated that the second tercile had the highest debt to equity levels per employee. The most profitable companies had the second smallest level of debt to equity per employee, whilst the third tercile had the smallest level of debt to equity per employee. The level of return on equity per employee varied along with the profitability levels. The first tercile had the highest return on equity level whilst the third tercile had the smallest return on equity level and it was negative, just as their profitability. The working capital to the turnover per employee varied along with the profitability of the terciles. The least working capital in relation to the turnover per employee was present within the most profitable companies, whilst the least profitable companies had the highest share of working capital operating in relation to their turnover per employee. There is a clear difference of achievements between the terciles. The most profitable companies had the highest financial incomes, at an intermediary leverage level. The least profitable companies, tercile two and three, had more modest achievements, even if their ranking was not perfectly decreasing along with their profitability. Nevertheless, the binding of resources was the smallest in relation to the turnover in the most profitable companies whilst the least profitable ones had the smallest efficiency of working capital in relation to their turnover.

In order to define the strength of variables' relationships, a correlation analysis is next performed:

Variables	Profitability	Debt to Equity	Return on Equity	Working Capital
Profitability	1.000			
Debt to Equity	0.020	1.000		
Return on Equity	0.762***	-0.050	1.000	
Working Capital/Turnover	-0.261**	-0.083	-0.203**	1.000

*** = p < .01, ** = p < .10.

Table 5.1b *Correlation Analysis of the Companies' Profitability (per Employee).*

Statistical significance to the *profitability level per employee* is indicated in most of the variables at the 99 percent confidence level, except for the debt to equity level. The correlation degree between the profitability level per employee and the return on equity level per employee was the strongest,

0.762. The debt to equity level per employee was positively related to the level of profitability per employee, 0.020, but negatively related to the average return on equity per employee, -0.050. The working capital is negatively related to the profitability per employee and to the return on equity, -0.261 respectively -0.203. The theoretical assumptions of section 4.2.2:1-4 are hence supported by both empirical analyses.

The *current assets* represent a share of 94.21 percent of the companies' total assets whilst the *fixed capital assets* represented a share of 5.79 percent:

The Relative Distribution of the Total Assets

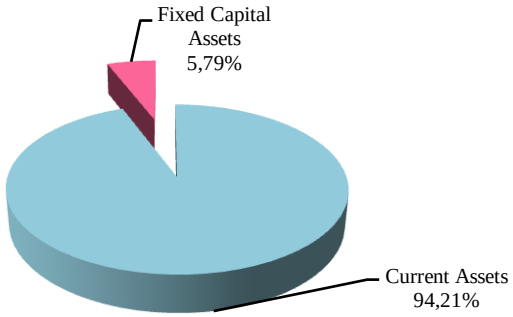

Figure 5.1a *The Relative Distribution of the Total Assets (per Employee).*

The available capital share deserves thus a rightful special attention in this research study. The different terciles' relative *liquidity* is hereby in-depth analyzed and the theoretical correspondence of section 4.2.2:5 is tested on the empirical dataset.

The average shares of *turnover* to *total assets per employee* are next presented:

Variable	Tercile 1	Tercile 2	Tercile 3
Turnover/Total Assets (%)	229.50	240.30	190.80

Table 5.1c *Turnover Shares per Total Assets (per Employee).*

The turnover of the most profitable companies was second largest. Tercile 2 had the greatest turnover in relation to its total assets whilst the third tercile had the most modest turnover share.

The *cash management analysis* of the stated terciles is next presented in Figure 5.1b. The total share of the cash management factors is proportional to the realized turnover per total assets, cf. Table 5.1c. The first tercile had an intermediary total share of current assets at work, the second tercile had the smallest share and the least profitable companies had the largest share.

The most profitable companies had the largest share of working capital management and the smallest share of liquid assets available in relation to their turnover. They had no inventory at all. Their share of accounts receivable exceeded the share of accounts payable, indicating that their suppliers received their average payment before the average customers' invoice was collected. Nevertheless, their share of working capital was larger than the share of accounts receivable and the difference is the largest of the terciles', 4.84 percent. They had thus a negative cash-to-cash cycle, which is desirable. The second tercile had the smallest share of working capital and a larger share of liquid assets at work in relation to their turnover. Their inventory share was smaller than in the least prof-

itable companies. Their share of accounts receivable exceeded the share of accounts payable, but not to the same extent as in the most profitable companies. In contrast to the most profitable companies, their share of working capital was smaller than that of accounts payable and this difference was the smallest of the terciles', 0.67 percent. They had a negative cash-to-cash cycle as well. The third tercile had the largest share of liquid assets and the second largest share of working capital in operation in relation to their turnover. Their inventory share was the largest. Their share of accounts receivable exceeded their share of accounts payable as well, to an intermediate level in comparison with the other terciles, 3.20 percent. They too had a negative cash-to-cash cycle.

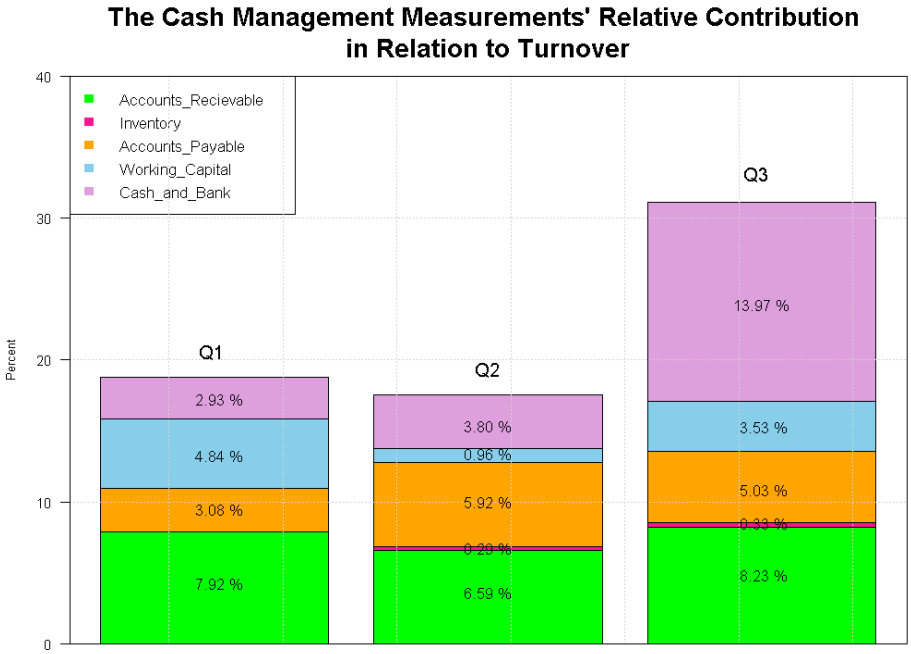

Figure 5.1b *The Cash Management Measurements' Relative Contribution in Relation to Turnover (per Employee).*

The difference in annual growth rates between the working capital per employee and the turnover per employee of the different terciles is next presented:

Group	Δ Working Capital to Turnover
Tercile 1	0.51 %
Tercile 2	2.23 %
Tercile 3	-2.47 %

Table 5.1d *The Capital Need of the Three Terciles (per Employee).*

The first tercile had the smallest difference between its average annual working capital per employee growth rate and its turnover per employee average annual growth rate, the second tercile an intermediary difference and the third tercile had the highest difference. The first two terciles' differences are positive, just like their profitability. The third terciles' difference is negative, just like its average profitability per employee was. Hence, working capital overflow was not as negative for the companies' profitability and innovation as the shortage of working capital was.

The liquidity-related key measurements' means are next presented as shares of total assets per employee and the cash-to-cash conversion cycle and its subordinated key measurements in days:

Variables	Tercile 1	Tercile 2	Tercile 3
Cash and Bank (%)	**19.23**	**2.28**	**10.81**
Long-term Capital Risk (%)	0.58	0.97	1.41
Short-term Capital Risk (%)	214.80	17.44	20.27
Fixed Capital Assets (%)	5.92	3.81	9.31
Cash-to-cash Cycle (days)	0.0001	0.8954	0.8547
Days Sales Outstanding	0.000217	0.000180	0.000225
Days Sales of Inventory	0.0000	0.8954	0.8546
Days Payable Outstanding	0.000092	0.000170	0.000133

Table 5.1e *Deepening Liquidity Analysis (per Employee).*

The available amount of *liquid assets per employee*, the cash and bank balance share of the total assets per employee of the companies varied strongly. The most profitable companies had the highest levels of cash available, whilst the second tercile had the smallest amount of liquid assets available in relation to its total assets per employee. The third tercile had the second-highest amount of cash at disposal per employee. The long-term capital risk, i.e. the withdrawn long-term liabilities in relation to the total assets per employee, was the smallest in the first tercile, second highest in the second tercile and the highest in the least profitable tercile. The current liabilities per employee share of the total assets, i.e. the short-term capital risk, was the highest in the most profitable companies, second highest in the least profitable ones and the smallest in the second tercile. The available fixed capital assets share in relation to the total assets per employee was the highest in the third tercile, the smallest in the second tercile and the second highest in the most profitable companies. The cash-to-cash cycle was the shortest in the most profitable companies and these had no days sales of inventory at all. Their amount of days sales outstanding was the second highest, whilst their days payable outstanding were the shortest. The second tercile had the longest cash-to-cash cycle, with the longest duration of days sales of inventory and days payable outstanding. Their days sales outstanding were however the shortest of the terciles'. The third tercile had the second longest cash-to-cash cycle, along with the second-shortest duration of days sales of inventory and days payable outstanding. Their days sales outstanding were the highest, indicating the smallest capacity of collecting rapid payments from the customers.

A correlation analysis is next performed in order to define the variables' relationships:

Variables	Cash and Bank	Long-term Capital Risk	Short-term Capital Risk	Fixed Capital Assets	Cash-to-Cash Cycle	Days Sales Outstanding	Days Sales of Inventory	Days Payable Outstanding
Cash and Bank	1.000							
Long-term Capital Risk	-0.268**	1.000						
Short-term Capital Risk	-0.449***	0.315***	1.000					
Fixed Capital Assets	-0.310***	0.032	-0.0001	1.000				
Cash-to-cash Cycle	-0.314***	-0.135	0.229**	-0.067	1.000			
Days Sales Outstanding	0.216**	-0.112	-0.012	-0.003	-0.132	1.000		
Days Sales of Inventory	-0.314***	-0.135	0.229**	-0.067	1.000***	-0.132	1.000	
Days Payable Outstanding	-0.006	0.051	0.002	0.129	0.013	-0.836***	0.013	1.000

*** = p < .01, ** = p < .10.

Table 5.1f *Correlation Analysis of the Companies' Deepening Liquidity Analysis (per Employee).*

Statistical significance to the level of *liquid assets per employee* is indicated in most of the variables at the 99 and 90 percent confidence levels, except for the days payable outstanding. The long-term and short-term capital risks were negatively aligned to the levels of liquid assets present in the companies, -0.268 respectively -0.449. Likewise, the fixed capital assets were negatively related to the existing liquid asset level, -0.310. Nevertheless, the cash-to-cash cycle was negatively related to the existing level of liquid assets, -0.314. The cash-to-cash cycle's subordinated key measurement were also empirically supported in such way that the assumed primary cash substitute, the days sales outstanding were positively related to the existing level of liquid assets, 0.216. The days sales of inventory were negatively related to the level of liquid assets, indicating a rather long cycle of inventory days and a greater difficulty of transforming the inventory into liquid capital, -0.314. The days payable outstanding were negatively related to the liquid assets as well, -0.006. These two last measurements indicate hence room of improvement in the companies' working capital management.

There is also a positive correlation between the short and the long-term capital risks, 0.315. Nevertheless, the short-term capital risk is positively correlated to the cash-to-cash cycle, 0.229, indicating that the current liabilities and the capital management are negative for the levels of liquid assets if not optimized. A positive correlation also exists between the short-term capital risk and the days sales of inventory, 0.229, indicating that this measurement is the most considerable one of the cash-to-cash cycles' subordinated key factors. The days sales outstanding were negatively related to the days payable outstanding, rather strongly, -0.836. This correlation indicates the opposite benefits of the subsequent measurements and an average negative cash-to-cash cycle.

Once again, the theoretical assumptions of section 4.2.2:5 have been statistically supported by the analyses.

The companies' adaptability to digitalization is lastly discussed in agreement with section 4.2.2:6. Table 5.1g presents the mean values of the relevant key measurements in relation to the existing levels of total assets per employee.

Variables	Tercile 1	Tercile 2	Tercile 3
Gross Fixed Capital Formation (%)	**5.34**	**2.84**	**7.90**
Fixed Capital Assets (%)	5.92	3.81	9.31
Long-term Capital Risk (%)	0.58	0.97	1.41
Fixed Capital Sales (%)	0.57	0.32	9.12
Fixed Capital Investment (%)	2.39	1.17	-0.84
Depreciation (%)	1.58	1.30	2.44

Table 5.1g *Adaptability to Digitalization Analysis (per Employee).*

The *gross fixed capital formation capacity per employee* varied perfectly along with the share of fixed capital assets per employee and depreciation level per employee. The third tercile, the least profitable companies, generated most gross fixed capital formation with the highest share of fixed capital assets per employee to their total assets per employee at their disposal and the highest levels of depreciation per employee. The most profitable companies generated the second highest gross fixed capital formation amount with the second highest fixed capital assets per employee share to total assets and second-highest level of depreciation per employee. The second tercile achieved the smallest share of gross fixed capital formation to the total assets, with the smallest share of fixed capital assets available per employee and the smallest depreciation level. The long-term capital risk was the highest in the third tercile and the smallest in the first tercile. The third tercile sold the

most fixed capital and disinvested, whilst the second tercile sold the least fixed assets and invested the least in relation to their total assets per employee. The first tercile practiced a moderate level of both fixed capital sales and investment.

A correlation analysis and two-tailed tests of significance were lastly computed for the companies' *gross fixed capital formation per employee* levels:

Variables	**Gross Fixed Capital Formation**	Fixed Capital Assets	Long-term Capital Risk	Fixed Capital Sales	Fixed Capital Investment	Depreciation
Gross Fixed Capital Formation	1.000					
Fixed Capital Assets	0.736***	1.000				
Long-term Capital Risk	-0.100	0.600***	1.000			
Fixed Capital Sales	0.031	-0.019	-0.065	1.000		
Fixed Capital Investment	0.009	0.160	0.225**	-0.538***	1.000	
Depreciation	0.267***	0.288***	0.107	0.349***	-0.042	1.000

*** = p < .01, ** = p < .10.

Table 5.1h *Correlation Analysis of the Companies' Adaptability to Digitalization (per Employee).*

The results indicate a pervasive and significant impact of the existing gross fixed capital assets within the companies' gross fixed capital formation process, 0.736. The depreciation level is nevertheless positively related to the gross fixed capital formation, 0.267. The long-term capital risk is negatively related to the levels of gross fixed capital formation, just as expected, -0.100. Both the fixed capital investment and sales are positively related to the levels of gross fixed capital formation even if the correlations are rather weak, 0.009 respectively 0.031. In comparison with the relative contribution of the gross fixed capital assets and depreciation to the gross fixed capital formation levels, the impact of fixed capital investment, fixed capital sales and long-term cash risk was not considerable.

The fixed capital assets and the long-term capital risk are positively correlated, 0.600. So are the long-term capital risk and the fixed capital investment as well, 0.225. The fixed capital sales act negatively on the level of fixed capital investment, -0.538, whilst they are positively related to the level of depreciation, 0.349. The theoretic assumptions of section 4.2.2:6 are hence supported.

5.2 Longitudinal Analysis

I next analyze the companies' achievements longitudinally in order to outline the differences in the key measurements before, during and after the dot-com crisis.

The data are hereby divided into three periods of interest: 1998 to 2000, 2001 to 2003 and 2004 to 2007. The first period comprises the three years before the crisis, the second period the three years surrounding the dot-com crisis and the last period comprises the four years after the crisis.

During the analyzed decade, the relative distribution of the total assets varied as presented in Figure 5.2a. During the dot-com crisis, the shares of current assets increased slightly whilst the fixed capital levels decreased. A higher share of fixed assets was present after the crisis, whilst the levels of current assets diminished to a level lower than before.

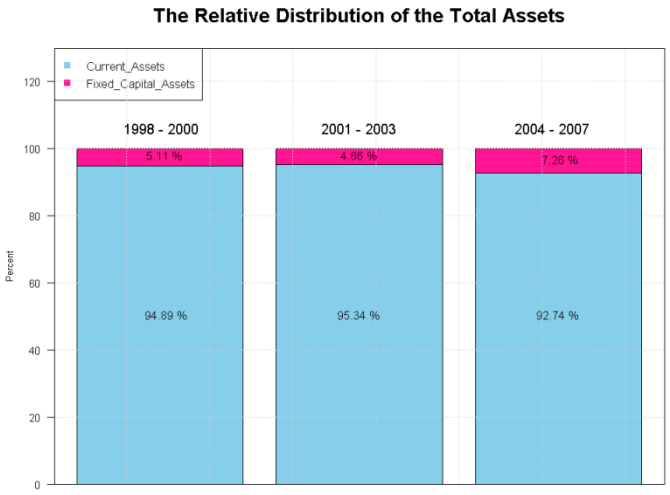

Figure 5.2a *The Relative Distribution of Total Assets (per Employee) in the Different Time Periods.*

The following table presents the key measurements' means in the defined periods:

Variables	1998 - 2000	2001 - 2003	2004 - 2007
Profitability (%)	**3.22**	**-1.84**	**0.03**
Debt to Equity (%)	93.82	66.42	65.82
Return on Equity (%)	1.66	1.94	3.06
Working Capital/Turnover (%)	7.74	12.47	4.47

Table 5.2a *Main Profitability Analysis (per Employee).*

The table indicates that the average *profitability per employee* was the largest in the first period, negative in the crisis period and a little above zero afterwards. The decrease during the crisis is of almost 5 percent, whilst the increase after the crisis is of barely 2 percent. The debt to equity level was the largest before the crisis, the highest during the crisis and the smallest in the period after the crisis. The return on equity varied from the smallest value before the dot-com crisis, to a larger value during the crisis and even higher return on equity per employee after the crisis. The working capital share varied in agreement with the companies' profitability. It was the highest before the crisis, the lowest during the crisis and intermediary after. Table 5.2a indicates hence increased efficiency of the internal productivity at constantly smaller debt levels, as the national economy suffered from higher inflation and current interest rates during the period of the crisis, cf. Figure A4 in Appendix 4. Nevertheless, more than this precautionary action, the decline in the companies' debt to equity can partially be attributed to the lower levels of long-term interest practiced in the national economy along the analyzed decade, cf. ibid.

The average *turnover shares per total assets* are next presented:

Variable	1998 - 2000	2001 - 2003	2004 - 2007
Turnover /Total Assets (%)	306.60	193.40	200.20

Table 5.2b *Turnover Shares per Total Assets (per Employee).*

The levels of turnover varied in agreement with the profitability levels. The turnover was the greatest before the crisis, the smallest during and moderate afterwards.

The relative shares of *cash management* are next presented in the time periods of interest:

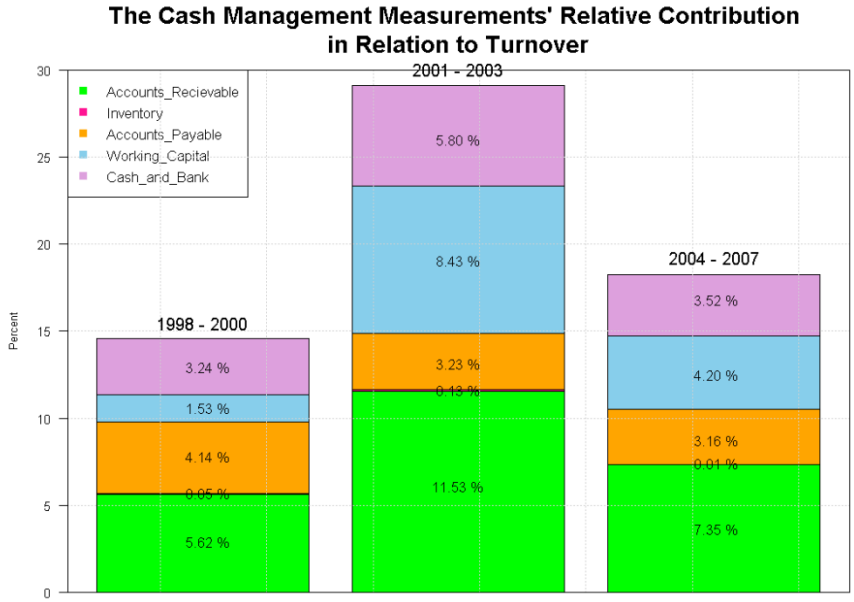

Figure 5.2b *The Cash Management Measurements' Relative Contribution in Relation to Turnover Before, During and After the Dot-com Crisis (per Employee).*

The figure clearly indicates that before the crisis, when the profitability level per employee was the highest, the total share of current assets in relation to turnover per employee was the smallest. During the crisis, when the profitability was negative, the total share was the greatest. After the crisis, when the profitability per employee was moderate, the total share was intermediary. The levels of current assets to the turnover per employee are thus clearly negatively aligned with the profitability levels per employee. The most profitable times, before the crisis, had the smallest relative shares of working capital and liquid assets in relation to the turnover. The least profitable times, during the crisis, the highest shares of working capital and liquid assets were present within the companies. After the crisis, when the profitability of the companies was intermediary, the shares of working capital and liquid assets were negative as well. The inventory share was the largest during the crisis, intermediate before the crisis and the smallest afterwards. The accounts payable were the largest before the crisis, diminished during the crisis and diminished even more afterwards. The share of accounts receivable was the smallest before the crisis, the largest during and intermediary after.

The differences between the average growth rates of working capital and turnover per employee, the capital need, are next presented for the different periods:

Time Period	Δ Working Capital to Turnover
1998 - 2000	3.49 %
2001 - 2003	0.51 %
2004 - 2007	-1.53 %

Table 5.2c *Capital Need Before, During and After the Dot-com Crisis (per Employee).*

The working capital average growth rates were positively related to the levels of turnover per employee in the first period and this difference is the largest. During the crisis, the marginal between the two measurements was the smallest. After the crisis, a certain shortage of working capital can

be observed. This difference is intermediary in relation to zero, which was recommended, but negative and must hence have diminished the companies' profitability and innovation.

The deepening liquidity analysis table follows hereby and outlines the internal managements' subordinated key measurements and their longitudinal variation along the decade:

Variables	1998 - 2000	2001 - 2003	2004 - 2007
Cash and Bank (%)	**9.93**	**11.22**	**7.05**
Long-term Capital Risk (%)	1.23	0.82	0.73
Short-term Capital Risk (%)	72.32	72.22	71.64
Fixed Capital Assets (%)	5.17	4.70	6.31
Cash-to-Cash Cycle (days)	4.9222	1.9766	19.8243
Days Sales Outstanding	0.00015	0.00032	0.00020
Days Sales of Inventory	4.9221	1.9764	19.8242
Days Payable Outstanding	0.0001175	0.0000934	0.0000972

Table 5.2d *Deepening Liquidity Analysis Before, During and After the Dot-com Crisis (per Employee).*

The available level of liquid assets in relation to the total assets per employee varied from an intermediary level before the crisis to the highest level during the crisis and to the most restricted level afterwards. The short-term and long-term capital risks diminished along the decade, as their values were the highest before and the lowest after the dot-com crisis. The available fixed capital assets were mediocre before the crisis, the smallest during and the highest after the crisis. The cash-to-cash cycle followed the same trend, as its duration varied from mediocre before the crisis to the shortest during the crisis and the longest afterwards. The level of days sales outstanding varied along with the levels of profitability, as the collection of cash from the customers was the most efficient before the dot-com crisis, the least efficient during the crisis and intermediary afterwards. Nevertheless, the efficiency of paying the suppliers was the smallest before the crisis, the highest during the crisis and rather weaker after the crisis, although a certain improvement was made from a priori to the crisis.

Since the profitability per employee was negative during the crisis, the time-specific management of working capital cannot be attributed the highest efficiency. The high level of liquid assets held at disposal during this period is hence a sign of attention, as well as the smallest amount of available fixed capital assets per total assets per employee, which indicates a certain resource rationalization, just as Figure 5.2a. The days sales outstanding indicate that the relatively high level of liquid assets was most plausibly precautionary held in order to compensate for the uncertainty associated with the inter alia longest duration of customer receivables. Nevertheless, this highest level of liquid assets held at disposal can be associated with caution of major investments, since the apparent improvement in the current and long-term capital risks could be considered rather insecure for business. However, the improvement in days payable outstanding acted positively on the partnership with the suppliers, as their payments were assured through the shortest invoice period of the decade and higher abundance of available liquid assets as own-financed insurance. The days sales of inventory were the fewest, but this low value is not an indicator of success in this case. It most plausibly indicates shortages of orders if comparing it to the intermediary level of days sales of inventory before the crisis, when the profitability was the highest. This secondary cash substitute is positively related to the level of profitability only when it can successfully be converted into cash.

The *gross fixed capital formation process* is hereby lastly analyzed. Table 5.2e presents the mean achievements in terms of its subordinated and related measurements:

Variables	1998 - 2000	2001 - 2003	2004 - 2007
Gross Fixed Capital Formation (%)	**3.94**	**3.89**	**5.57**
Fixed Capital Assets (%)	5.17	4.70	6.31
Long-term Capital Risk (%)	1.23	0.82	0.73
Fixed Capital Sales (%)	4.67	3.90	0.60
Fixed Capital Investment (%)	3.11	-0.69	0.61
Depreciation (%)	2.40	1.60	1.02

Table 5.2e *Adaptability to Digitalization Before, During and After the Dot-com Crisis (per Employee).*

The results indicate that an intermediary level of *gross fixed capital formation* was produced per employee in the period before the crisis at an intermediary level of fixed capital assets and the highest level of long-term capital risk. The period of the crisis was associated with a certain rationalization phase in the previous analysis and this fact is nevertheless observable here in the lowest capacity of gross fixed capital formation, at the smallest level of fixed capital assets and an intermediary level of long-term liabilities. In the period after the crisis, the capacity of gross fixed capital formation was the highest, as well as the level of fixed capital assets, whilst the long-term capital risk was the smallest. The levels of depreciation decreased along the analyzed decade, as they were the highest before the crisis and the smallest afterwards. Likewise, the fixed capital sales and investment levels changed from rather intense before the crisis to moderate levels after the crisis. During the crisis, the companies disinvested and sold fixed capital assets to a relative high extent if considering the longitudinal sales trend of fixed capital assets of the decade.

5.3 Analysis of the Empirical Results

The previous analysis sections examined the companies' management efficiency through the resource-based perspective in terms of common accounting measurements. The analyses revealed how the companies allocated their resources and which of the achievements contributed most to their profitability, as well as to what extent. The measurements were also analyzed longitudinally in order to clarify their characteristics before, during and after the dot-com crisis.

In this section, both the *qualitative* and *quantitative* findings are discussed in terms of their significance and implication to the research topic.

1. *Qualitative Results*

The qualitative analysis showed that the companies of this study upgraded their businesses constantly in order to adapt to the time-specific digitalization progress, see pp. 32-35. Nevertheless, they were adapting, sustaining and improving other business segments' operability on IT-related basis, acting as vital industrial carriers in the regional economy. Their main driving force was innovation and their products and services capitalized on both own innovations and technological upgrades. The information technologies were mainly used as means of strategic renewals, marketing and contacts with the customers. Nevertheless, they wan awards within inter alia technology, user friendliness and solidity, indicating great internal awareness of their management capacity. They all emphasized customer support and consultancy services and were increasingly extending through web-based and other Internet-supported solutions. Their own administrative services were improved through inter alia technologically-enabled payment and order possibilities.

Focus lied on nurturing long-term relationships, by offering consultancy and administration possibilities even after the deliverance of the services or products. Growth and new customer relations were achieved through both acquisitions and internal strategic activities. In order to improve their resource management, they outsourced parts of their production, bought competitors or changed the internal strategic configurations of their businesses.

There was little qualitative evidence of the consequences brought by the dot-com crisis, but one company specifically mentioned its negative impact on its operability, see Galileo Nordiska p. 33. It can also be stated that the continuous technological improvements of the businesses' information and production systems resolved existing insufficiencies, adjusting them for a higher performance and increased meeting of demand.

The respondent of the survey, Michael Niva from Softronic Enterprise Partner, personally confirmed the majority of these identified trends, see p. 32. He strongly believes that the process of digitalization is beneficial for business and that technological innovation is vital for the improvement of the company's strategic position. Both technological and business administration knowledge was materialized in the bundle of services offered, which were constantly improved. Nevertheless, he confirmed the fact that the company's geographical position is profitable, as ninety-five percent of their customers were from the area. Most importantly, he also agreed on the fact that a company's profitability highly depends on the performed investments and its internal management. He nevertheless confirmed the fact that the profitability was negatively affected by the dot-com crisis and that its consequences were observable. The remedy to decreased profitability lied within the company's ability of adapting to the time-specific techno-societal changes and being constantly updated with the surrounding world's digitalization trends.

The major part of the discussed conceptual aspects was hence reflected in the qualitative analysis. Even if the individual business strategies and target groups of the companies varied, many of the practised business commonalities are widely discussed in the consulted management theory. Nevertheless, evidence was found for the fact that the companies and their related sectors were affected by the technological trajectory and its socio-economic response in a pervasive manner.

2. *Quantitative Results*

The hypothetical support of the quantitative analyses is hereby concluded:

Hypotheses	Supported	References
1, 2, 3	Yes	Main Profitability Analysis: Tables 5.1a, 5.1b and 5.2a.
4, 5, 6, 7, 8, 9, 10	Yes	Deepening Liquidity Analysis: Tables 5.1e, 5.1f and 5.2d.
11, 12, 13, 14, 15	Yes	Adaptability to Digitalization Analysis: Tables 5.1g, 5.1h and 5.2e.

Table 5.3 *Conclusions of the Hypothetical Support.*

The *null hypotheses* of the significance tests could not be statistically supported as scientifically true and the significant *correlations* were therefore accepted on basis of their alternatives. Nevertheless, the *univariate* analyses' results were consistent. The quantitative findings matched the theoretical expectations to a great extent.

The *profitability per employee* of the companies was the greatest before the dot-com crisis, the smallest during the crisis and intermediary afterwards, cf. Table 5.2a. These results supply quantitative evidence of the fact that the *dot-com crisis* affected the companies' development negatively during its duration and brought consequences in its subsequent period.

The *main profitability analysis* revealed that the independent variables return on equity, debt to equity and working capital are all of importance to the companies' profitability, cf. Table 5.1b. Hence, the profitability measured in *productivity*, was positively affected by the management systems' *quality* of internal processes, expressed in return on equity and leverage level. Nevertheless, the *time efficiency* was defined in terms of working capital, which is a result of the order management systems and decisions related to the internal resource management. The *flexibility* of the companies was also supported by the analysis results, since the measurements' configuration must be adapted to the time-specific best practises and arising changes within digitalization, measured through inter alia the process of gross fixed capital formation and fixed asset management.

The measurement's statistical significance to the levels of profitability is supported in Table 5.1b. *Hypothesis 1* was supported by the fact that the return to equity was positively related to profitability, to the strongest extent, cf. Table 5.1b. Nevertheless, Table 5.1a indicated that the return on equity was the largest in the tercile 1 and negative in tercile 3, just as the levels of profitability. The return on equity was the largest after the crisis, being hence positively affected by the decreasing leverage levels and rationalization of working capital practised along the analyzed period, cf. Table 5.2a. It can hence be stated that *Hypotheses 2* and *3* were also supported on the same basis. Smaller leverage levels are positive for profitability. Nevertheless, smaller shares of working capital of the total assets unlock valuable resources, which eventually boost the level of profitability. A too large share of working capital is hence risky.

Hypothesis 3 is also supported by the results of the *cash management* and *capital need* analyses. Table 5.1a indicated the lowest share of working capital to turnover in the most profitable companies, and the largest share in the third tercile, which contains the least profitable companies. Furthermore, the *cash management analysis* indicated that larger *total current capital shares* are not associated with greater profitability, cf. Figure 5.1b and 5.2b. The smaller current assets shares of terciles 1 and 2 proved to be more profitable than the large share of current assets of current assets present in tercile 3, cf. Figure 5.1b in comparison with Table 5.1c. Furthermore, by comparing Table 5.2b to Figure 5.2b, it is also clear that the smallest total current capital shares of the period before the dot-com crisis were the most profitable and that the largest shares during the dot-com crisis were negative for profitability. Third, the intermediary level of total current assets of the period after the crisis can be associated with the time-specific intermediary profitability level.

The *capital need* of the companies was most efficient when the difference in annual growth rates between turnover per employee and working capital was the closest to zero, cf. Table 5.1d. Nevertheless, the same analysis applied through the longitudinal perspective indicates that before the crisis, a plentiful share of working capital was practised in relation to the obtained turnover, cf. Table 5.2c. During the crisis, this marginal was the smallest, indicating efforts of increasing the resource management efficiency. After the crisis, a negative marginal was practised, most plausibly of caution or certain shortages caused by difficulties brought by the crisis.

By consulting the corresponding time-period's *deepening liquidity analysis* of Table 5.2d, it can be stated that the inventory played a main role in this negative marginal share. The days sales of in-

ventory were the largest between 2004 to 2007, indicating long production cycles and current asset bottlenecks. This problem can also be seen from the perspective that the companies were in a growth phase, and as the theoretical study specified, they then bind a consistent share of their current capital in inventory. The accounts payable were delayed the most during this period as well, which fact can also be related to the time-specific shortage of working capital. Hence, a more balanced current asset management would have been desirable. The analysis also indicates that the fixed asset share was the highest during this period, a fact which agrees with the tendency of the companies being in a growth phase. Since more capital was bonded in technology, upgrades are a plausible explanation. Technological innovation is frequently used to sponsor growth.

The same analysis, Table 5.2d, indicates that *during the dot-com crisis*, when the marginal share of capital need was the smallest, the share of current assets invested in inventory and the fixed capital asset shares were the smallest. This fact is in agreement with Figure 5.2b, which indicated that the largest share of current assets were at work in relation to the obtained turnover. Hence, more current resources were kept busy but the low inventory share indicated by Table 5.2d is most plausibly a result of order shortages. The company's time-specific cash-to-cash cycle time was also negatively affected by delayed customer receivables during the dot-com crisis, cf. ibid.

The period *before the crisis* had a certain working capital excess in relation to the other periods, as previously discussed in Table 5.2c. Table 5.2d showed that this period was characterized by the largest short-term and long-term capital risks, which are believed to have acted negatively on the existing levels of cash and bank. The technological innovation of this period was intermediary, as described by the fixed capital asset share of the total assets. Furthermore, the intermediary level of cash-to-cash cycle and the inventory indicate a relatively stable and functional development phase, with the shortest period of accounts receivable. I interpret these findings as healthy relations with the customers, whose perception of the economy was positive before the crisis. Nevertheless, the longest period of days payable outstanding indicate favourable relationships with the suppliers, which fact allowed for a greater internal flexibility of the working capital management.

The deepening liquidity analysis' statistical significance is supported by Table 5.1f, which indicates that all the measurements except days payable outstanding are relevant at the 99 and 99 percent significance boundaries. *Hypotheses 4*, *5*, *6*, *7*, *8* and *9* are thus supported by these findings. The difference between the theoretical and empirical support lies in the fact that the inventory was negatively related to the cash-to-cash cycle, but this fact indicates development problems and have just been discussed in the previous paragraphs. The days payable outstanding were not significantly correlated to the levels of liquid assets, mainly because the difference in their cycle was relatively low and negative cash-cycles can be accepted as management practise under desirable circumstances. Therefore, this lack of significance does not affect the results negatively.

The *longitudinal characteristics* of the quantitative study are nevertheless in agreement with the *national* and *regional trends* identified in the economy, cf. Figure 2.2a and 2.2b. The period before the crisis was the most prosperous one, whilst the crisis brought along economic tensions in terms of increased bankruptcies and generic market exits and fewer market entries. Nevertheless, the national indicators treated in Figure A1a and A4 indicate difficulties in the period of the dot-com crisis and consequences afterwards as well.

The *historical perspective analysis* in section 2.1 is reflected in both the qualitative study and in the quantitative support, as the fixed assets received a larger relative share of the companies' total

assets along the analyzed decade, cf. Figure 5.2a. Hence, the socio-economic changes occurring in the media sector and technological infrastructures nurtured the companies' development through improved and innovated IT-related products and services. Even the integration of diverse sectors with the domain of the analyzed companies was intensive, cf. Figure 3.1b. In the quantitative data, the digitalization trajectory was supported by the improvement observable in Table 5.2b, as the period after the crisis had an intermediary efficiency of generating turnover in relation to the total assets. During the crisis, the turnover in relation to the total assets was the smallest, cf. ibid. These trends are nevertheless in agreement with Figure 5.2a, which indicated rationalization of fixed assets during the crisis and the largest share afterwards.

The analyses of *adaptability to digitalization* nevertheless support the trends discussed in these two previous paragraphs, cf. Table 5.2e. The gross fixed capital formation process was the most intense after the crisis, the most modest during and intermediary before. The share of fixed capital assets present after the crisis was the highest, whilst the time-specific depreciation levels were the smallest. This fact is in agreement with Moore's law previously discussed in section 3.1, which attributed the digitalization trajectory the beneficial change of more power obtainable for less money. Nevertheless, the constantly lower growth rates of the long-term interest in the national economy, cf. Figure A4, are also reflected in the analysis of Table 5.2e. More fixed capital could be purchased more favourably than in the beginning of the decade, nurturing innovation not only through higher efficiency of the equipment and the machinery, but also through its intensity in relation to the total shares assets. As previously discussed, this fact is also beneficial from the perspective that smaller total shares of current assets are generally more efficient than larger shares.

The statistical support was rather strong for the fixed capital assets and depreciation, cf. Table 5.1h. The long-term capital risk was not found to be significantly negative for the gross fixed capital formation, being hence in agreement with the previous conclusions. It was however quite strongly positively related to the fixed capital assets, both being considered expenses in this case. The fixed capital investment and sales were not significantly supported in relation to the gross fixed capital formation, but they were the lowest relative ones, cf. Table 5.1g. However, their sign was positive, just as expected. The relation between depreciation and fixed capital sales was positive and rather significant. The relation between the fixed capital investments and sales was negative, just as expected. *Hypotheses 11*, *12*, *13*, *14* and *15* were hence also supported to a major part.

6 Conclusions

The master thesis' main belief that *a company's profitability depends on the practiced management and performed investments* was supported by the analyses and this case study has hence fulfilled its purpose. The fact that "the dot-com crisis" occurred during the analyzed period offered the possibility of obtaining information about the companies' development before, during and after this crisis. The findings enhance the understanding of how the companies were successfully managed in these difficult times. The most profitable factors were stated and the unsuccessful companies' experience was clarified.

Sweden is increasingly digitalized and one of the most technologically-endowed countries in Europe. Part of this development nourished the corporate development. The digitalization path was found to be positive for the companies and diminished the consequences brought by the "dot-com crisis", "in-house" production of material and the "media fragmentation" phenomenon through the emerging "media convergence" and technological innovation. The Internet has thus played an increasingly important role in the products and services of these companies.

The selected companies are of the time-specific most frequent occurrence in terms of size and nevertheless, they were innovation pioneers, not followers. They are vital information distributors of the regional economy and important carriers of technological development into related sectors.

The profitability of their internal management was pinpointed in common management theory and accounting standards, emphasizing the importance of their working capital management. Their efforts of adapting to the occurring digitalization trajectory were mainly defined to be diverse technological upgrades and increasingly endowed Internet-supported solutions.

Both qualitative and statistical support was found for the theoretical assumptions. Hence, by testing prior knowledge on this data sample, the knowledge about the dot-com crisis' impact on corporate profitability could be extended.

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Appendix 1 – The National Economic Development and Information Expenditures

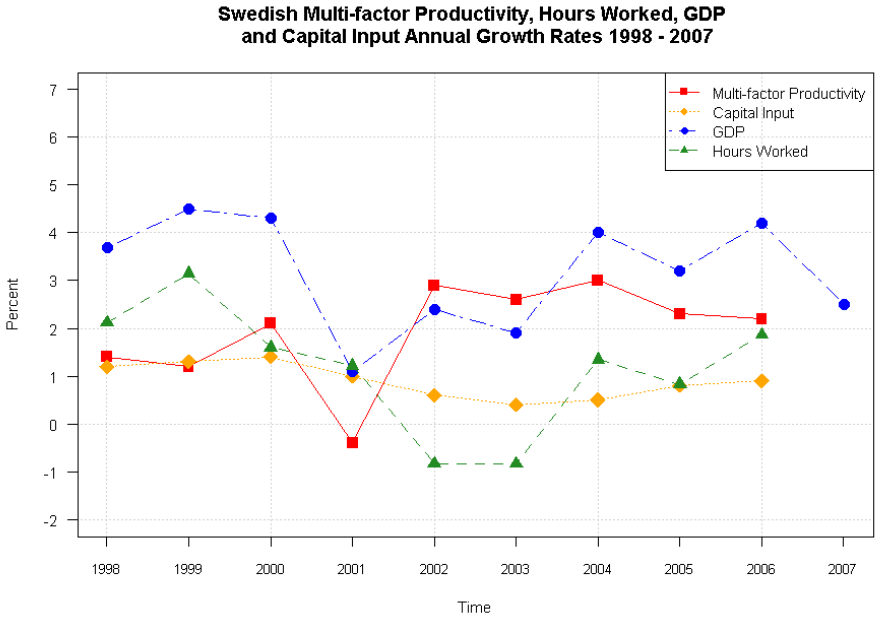

Figure A1a *Sweden's Multi-factor Productivity, Hours Worked, GDP and Capital Services Input Annual Growth Rates 1998 to 2007 (OECD Statistics 2009).*

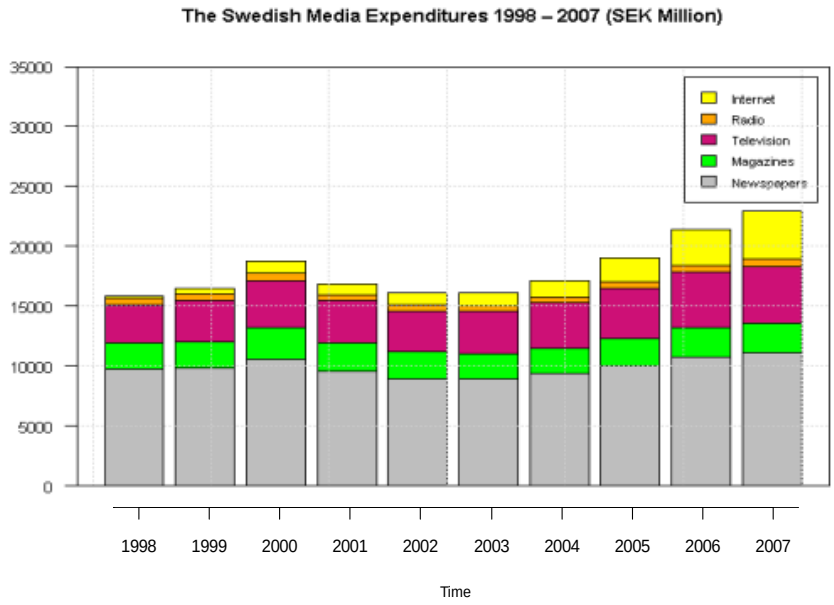

Figure A1b *Sweden's Media Expenditures 1998 to 2007 (WARC 2009).*

Appendix 2 – Survey

Historical aspects:

1) Did the dot-com crash of 2001 cause consequences in Your business? If affirmative, how were these felt present and how were they defied? (Examples: debts, rationalizations, investment strength, financial losses, new business opportunities, etcetera)

2) Is the digitalization process profitable for business within the information sector in Your opinion? On which indicators do You base Your answer?

3) On a scale from 1-10, where 1 is the smallest and 10 is most important, please state the degree of profitability associated with the corporate digitalization activities.

4) Were the company's strategies influenced by the societal digitalization trajectory? If yes, within which aspects?

5) Does IT exist as stand-alone strategic pillars in the organization's objectives? If no, in what other strategic objective is IT included?

6) How are the corporate digitalization objectives measured?

7) Do You believe that the profitability in the information service sector depends on how well a company keeps itself updated in relation to the surrounding world's digitalization trends?

8) Which technological factors and changes have influenced the corporate profitability the most during the period 1998 to 2007? (Examples: ISO standardization, introducing of measures for intellectual capital in annual reports, multimedia, the Internet, DVD, social networks, the IT bubble, etcetera)

Internal aspects:

9) How do You hold Yourself updated about the surrounding world's digital changes? Has Your analysis methodology of the surrounding shifted during the period 1998 to 2007 and what does the difference comprise?

10) Are Your technological investments affected by previously acquisitioned technological solutions/machines' profit? How?

11) Which last investments in software and hardware has the company done? Are these considered profitable for the work flow?

12) Which digitalization aspects/purchases were experienced as negative for the organization and of which reason? (Examples: production complexity, system break-downs, bottlenecks, programs/software, etcetera)

13) Do You lease IT services? Which? (Examples: consultancy, multimedia, market analysis, accounting, etcetera)

14) Do You outsource technological organization divisions? Which, and in what scope?

15) Does the company practice IT-educations to render more efficiency in the human factor in relation to the technologies? Are the educations internal or external and are they regular? Which aspects are covered by the training?

16) Which initiatives have been done in order to adapt the corporate technologies to the environmental regulations?

17) Which ergonomic initiatives have been done within the organization?

18) Is there an existing intranet in the corporation? Is this considered effective?

19) Does the company have a web site? Is this perceived to be important and profitable?

20) Has the company implemented a web-based systems for customers/members? Is this profitable and has it made working more efficient?

21) How do You collect information about the customers' opinions? Which areas are most important? Do these results constitute a base for strategic mappings and refinement?

22) Do You offer technologic support and education for Your customers? If yes, is this activity profitable and pervasive?

External aspects:

23) Do You consider that medialization and marketing have become more profitable with today's more effective technological infrastructure?

24) On a scale from 1-10, where 1 is the smallest and 10 is most important, please state the degree of profitability associated with the organization's media activities.

25) Through which channels, You distribute information? (Examples: the web and multimedia, radio, direct advertising, leaflets, television, newspapers, etcetera)

26) Do You hire computer or media companies in order to spread information or do You do it in-house?

27) Do You consider that Your technological level is competition promoting in relation to other companies within the sector?

28) Do You share information with other equally disposed companies in the information sector? How?

29) Which is Your main technological advantage respectively disadvantage?

30) Any future technological investment plans?

31) Do You consider that the geographic position in Stockholm area plays a role in the organization's profitability? In what manner?

Appendix 3 – The Microeconomic Dataset

See the Stockholm_Joint_Stock_Companies_Lavinia_Bleoca.xlsx attachment (Annual Reports 1998 - 2007).

Appendix 4 – GDP, Inflation, Current and Long-term Interest Growth Rates

The consequences of the dot-com crash for the Swedish economy were greater *inflation* and *current interest levels*, see Figure 5. The long-term interest rate increased slightly in 2000 and 2002. The *inflation* and *interest rates* decreased until 2005, but increased again from 2006.

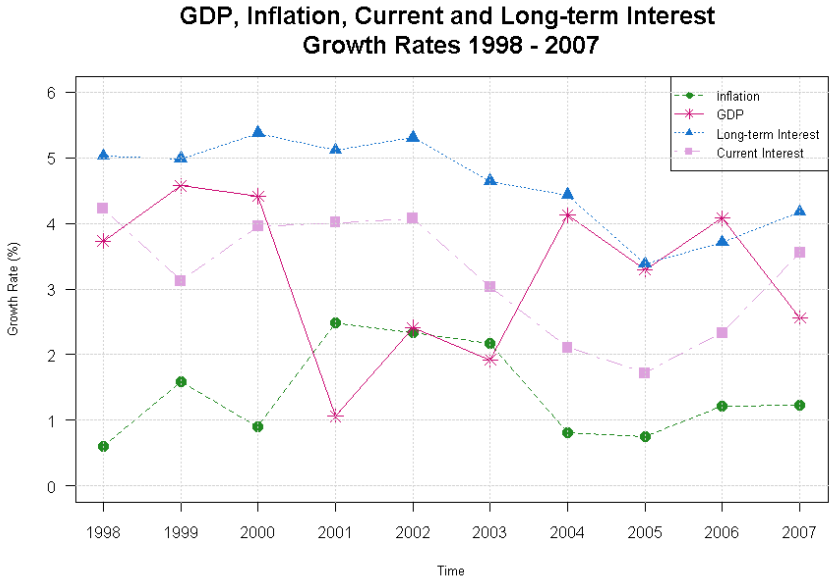

Figure A4 *The Swedish GDP (Maddison 2009 and IMF 2009), Current and Long-term Interest Levels (Statistics Sweden 2009f) and Inflation (Statistics Sweden 2009g) 1998 to 2007.*