Intellectual Capital

- A determinant of market value volatility

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Acknowledgements

Abstract

The issue of intellectual capital has very much been in the spotlight as of late. Intellectual capital can be defined as the soft assets that cannot be found on a balance sheet but certainly has an impact on future success or failure. Even though the importance of intellectual capital has been recognized much can be said about the disclosure of these assets. Starting in the late 1980s a few models have been developed in order to capture and visualize a company's intellectual capital but there are no standards, leaving it up to the companies themselves to decide how to present their hidden assets.

In this thesis an attempt has been made to, based on a few theoretical paradigms, construct a model that can be used to rate a company's intellectual capital using publicly available information only. The question has been whether or not transparency has an impact on market value volatility. After analyzing a number of IT/Internet-consultants we have come to the conclusion that transparency may have an impact on market value volatility. The relationship between transparency and volatility found in this thesis is, considering the data, rather strong but needs to be verified through further research before it can be definitely established.

Key words: intellectual capital, transparency, volatility

1 Introduction

In the first chapter we will try to give the reader a background to the problem, we will discuss the different aspects of the thesis and the problems behind it. Furthermore, we will state our purpose and present the delimitations that we have been required to do as well as give an outl
ine of the thesis.

1.1 Background

The amount of material written on the subject of company valuation is never ending. A lot has been written and a lot more is still to come. Many theories have been presented and so have scores of models. Up until recently though, a large amount has been based on the financial reports as presented by the organizations. This dates back more than half a millennium to the Italian double bookkeeping and as long as company assets could be visualized in this fashion, it was a reasonable foundation for an evaluation. However, with the almighty "new economy" making its presence felt more and more, new methods and sound alternatives must enter the market, and they have.

In the "old economy" much of a company's assets lay in its machines, inventories, factories etc. while in the new economy a large portion of the value of a company is hidden. Contrary to this though, is the fact that experts estimate as high a share as 75 percent of the market values in the manufacturing industry originate from knowledge[1] (manufacturing being a part of the more traditional economy and knowledge being an asset not accessible in the conventional bookkeeping methods). Furthermore, although the traditional reporting system that is the balance sheet has worked well for more than 500 years, it only provides the viewer information of the situation in the company at a specific moment. It is sort

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[1] Moore, 1996.

of a snapshot of how healthy the company is at the time. A tool is needed that can complement the balance sheet, providing information regarding both the hidden assets of a company as well as giving the auditor a good idea of where the company has been, where it is going, and how it will get there.

James Tobin, Nobel laureate and one of this century's most admired economists, proposed the idea of q in 1969. Q is the ratio of *the market value of a company* (its market capitalization) to *the replacement cost of its assets*. As Tobin pointed out, q ought to have the value one (1) since both the numerator and the denominator are just two ways of measuring the same thing: the value of a company[2]. However, in June of this year, the Wall Street q stood at well above two and extensive statistical research of q-values shows that, as can be expected, when the ratio moves far above one, equilibrium is indeed restored over time. Not, however, by a surge in the replacement value of companies' assets but by a correspondingly dramatic fall in the value that Wall Street places on them. In other words, there is a stock market crash[3]. What then, lies behind these remarkable figures? As Tobin himself has noted, the weakness of q in valuing today's firms is the importance of intangible assets. Such assets are either undervalued or ignored in the denominator of the ratio, causing it to be overstated and, as already mentioned, intangible assets are an increasingly important factor in the "new economy".

Some claim that the new economic era began around 1991 when IT expenses for the first time exceeded total expenses for all other capital goods in the U.S.[4] New methods to capture the value creating components of a company were, however, developed already in 1987 by a Swedish working group called the Konrad group. That year the group put together and published the well-known "Konrad theory"[5]. The new theory was widely recognized and acclaimed and a number of Scandinavian companies embraced it and started using it in their annual reports to highlight their intangible assets. The theory was further developed and fine-tuned

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[2] Economist, 2000.
[3] If today's market fell merely in line with the collapse after 1929, the Dow Jones industrial average would drop to less than 2000 compared to today's value of appr.11 200 (Sept. 13, 2000).
[4] Hofman-Bang & Westerlund, 1997.
[5] Sveiby, 1998.

by Karl-Erik Sveiby and the resulting model was called the Intangible Asset Monitor (see theory section for an in depth description of the model). Independently from the Konrad group another management tool; the Balanced Score Card[6] was developed in the U.S. around 1990. Whereas the Intangible Asset Monitor and the Skandia Navigator- developed by Leif Edvinsson and first used as a supplement to the 1994 Skandia annual report (see section below and theory section)- both are designed so that the intangible assets can be measured and published, the BSC on the other hand is only intended to take a more "balanced view" on internal performance measurement. Although not identical, the three above mentioned theories/models are similar in that they all suggest that non-financial measures must complement the financial indicators and that the non-financial ratios and indicators must be lifted from the operational to the strategic level of the firm. Finally, there is conformity between the three that the new approach to measuring is not a new control instrument; it should be used for improving learning and dialogue[7].

Intangible assets or Intellectual Capital (IC) are two common phrases used to capture resources such as human capital, processes, customers, patents, brand names and networks. The problem in analyzing IC is the sheer breadth of the conventional definition, considering all value in excess of book value[8]. Former Director of Intellectual Capital at the Swedish insurance company Skandia, Leif Edvinsson, was among the first to attempt to create a model as well as a universal language and standard for presenting IC. He did so in a supplement to Skandia's annual report in 1994[9]. In the supplement, Edvinsson came to the conclusion that IC is what is left when the book value is deducted from the market value of an organization.

Market Value = Financial Capital + Intellectual Capital

Equation 1. Source: Edvinsson & Malone, 1997.

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[6] Kaplan & Norton 1996.
[7] Sveiby, 1998.
[8] Booth, 1998.
[9] Edvinsson & Malone, 1997.

Furthermore, he divided IC into four different areas: *human capital, customer capital, process capital* and *innovation capital.* Adding *financial capital* to these four equals the market value of a company. The model has become known as the ***Navigator***.

Following Skandia's pioneering work with the Navigator, other companies followed. Dow Chemical, Canadian Imperial Bank of Commerce (CIBC) and Hugh Aircraft are among those who have undertaken significant efforts to measure and manage their IC[10]. As Nicholas G. Moore, chairman and chief executive of New York-based Coopers & Lybrand L.L.P, points out, most of these developed models deals with IC from two perspectives: human capital and structural capital (when added together, customer capital, process capital and innovation capital become structural capital in Mr. Edvinsson's model). According to Moore, these have limited utility. What he proposes are earnings-based, bottom line measurements so that IC can be "identified, measured, managed and leveraged to create competitive advantage and improved financial performance"[11]. The Enterprise Value Chain is his solution in which four processes (subsystems) – Leadership, Customer, People, and Operations – are linked by three value drivers – Core competencies, Customer preference, and Shareholder value. The Enterprise Value Chain recognizes that organizations are dynamic and comprised of the above-mentioned processes, which allows for the organization to understand and value IC.

Yet another model intended to capture/value intangible assets is the Knowledge Capital Scoreboard, issued annually in *CFO Magazine.* The methodology behind the model is designed by worldwide acclaimed accountant Baruch Lev of New York University's Stern School of Business. As opposed to most other accepted measures of intangible assets where input is emphasized, Lev's methodology proposes ways to measure the earnings impact resulting from knowledge-based

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[10] Moore, 1996.
[11] Ibid.

activities[12]. Lev uses the expression knowledge capital for intangible assets and this knowledge capital can be computed by discounting all future knowledge earnings to the present. Furthermore, CFO Magazine claims that the Scoreboard offers evidence that knowledge capital predicts market performance with more accuracy than does either operating cash flow or net earnings, and that companies that achieve high performance levels consistently show higher investments in three key drivers of knowledge capital: advertising, R&D, and capital spending.

Whatever method investors are using to value companies, it is obvious that much more attention is being paid to IC and the future possible earning potentials they represent nowadays. What else than the hidden assets, the intellectual capital, dwelling within Time Warner made AOL announce that they were willing to exchange $146 billion worth of stock and agree to pay $38 billion of future liabilities for a company with net tangible assets of $9 billion[13]? What else than the non-material assets such as brand name, licenses, customer loyalty etc gives the market as much confidence as to value Microsoft at about 20 times its book value[14]? Even though the above examples are somewhat extreme, focus has shifted from tangible assets to intangible assets as the vehicle for future profits. And that is true not only for newly emerged highly valued .com companies but also for traditional manufacturing companies. Whatever business you are in, if you do not take your IC seriously, you will not likely fare well in the days to come.

1.1.1 Intellectual Capital Sweden AB

This study is performed in close co-operation with Intellectual Capital Sweden AB (ICAB) and the following section is based on material that can be found on ICAB's Internet homepage[15]. For a further presentation, turn to section 3.5.

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[12] Mintz, 2000.
[13] Buckley, 2000.
[14] Hulsey III, 1998.
[15] www.intellectualcapital.se 27/9-00.

Intellectual Capital Sweden AB was founded in March 1997 on the initiative of Mr. Leif Edvinsson - former Director of Intellectual Capital at Skandia, "Brain of the year" in 1998, and A-Com - the largest advertising and marketing communication corporate group in Sweden. With thoughts and theories of intellectual capital as a starting point, a model for valuation of knowledge-based companies has been constructed. From this model, a tool has been developed - IC Rating^{TM} - which measures intellectual capital and makes it comparable between companies and between units within a company.

In July 2000 we approached ICAB with a proposal for this thesis and we met with them in Stockholm on August 16th. After exchanging ideas back and forth we came to a mutual understanding on an interesting topic and how we should progress. Our goal was to present a problem that had an academic interest as well as being interesting to the market.

1.2 Problem discussion

1.2.1 Hypothesis & volatility

The hypothesis we intend to test is: *the more transparent a company is, in regards to its Intellectual Capital, the less volatile its market value will be*. To test our hypothesis a model designed to rate IC using publicly available information will be constructed. Our hypothesis would seem reasonable if the transparency[16] was referring to an organization's financial capital. It is in the interest of the public to increase the transparency in the financial markets simply because an increase in information, and the number of actors that are aware of the situation, will make it harder to manipulate the market. Investors want to decrease the transaction costs

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[16] The notion transparency will in this thesis be regarded as the amount and quality of information communicated to the public regarding intellectual capital.

as well as the volatility[17],[18]. Of further interest for this study is the fact that the low transparency in the business environment, from which our sample is chosen, (see section 1.4 and 2.5 for a discussion and presentation of the sample) is believed to increase the volatility.[19] Schinasi et al who say "of paramount importance in averting future turbulence and crises are improvements in financial disclosure and transparency" have also stressed the importance of disclosure and volatility.[20]

Since this study deals with IC and the fact that we believe that non-financial information is an important value driver we find it most interesting to test our hypothesis using non-financial information. Variables upon which the model can be tested include *Market Value* and *Value Added*. A problem inherent in using market value as the dependent variable is how to disregard the impact financial information has on a company's market value. On the other hand, Baruch Lev claims that as much as 95 percent of stock volatility is induced by non-financial information[21]. Says Lev, "There is no magic here. If you want to be able to assess what is missing now, you need some information about a company's customers, about its employees, about its capability to research and bring products quickly to market. The current situation is that all this information to some extent is proprietary. The current situation is that nothing is out and people feel great uneasiness"[22].

And uneasiness breeds volatility, which in this market is the sign of either too much information or not enough[23].

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[17] Affärsvärlden, 1995.
[18] The volatility of an asset is measured by the variability in its prices over time- that is, the variance or standard deviation in prices (Damodaran, 1997).
[19] Affärsvärlden, 1999.
[20] Schinasi et al, 1999.
[21] Edvinsson & Malone, 1997.
[22] Buckley, 2000.
[23] Ibid.

1.2.2 External vs. Internal

The problem with all of the models discussed in the background section is, that they are based mainly on internal information. That is, they rely on information, which only may be found by researchers who have access to data known solely within the company. This information may be hard to come by even if inside knowledge is accessible. It often requires in-depth interviews with e.g. management, employees, customers and suppliers. Furthermore, models may involve statistical research institutes providing figures on e.g. leadership and motivation indices. All in all, this means that the models become complex and require that a large amount of time and resources be set aside to measure and visualize the IC. Our intention is to create a model that can be used by external viewers. In short, we intend to do the following:

- Based on existing models, create a model consisting of parameters where the data easily can be found in a standardized set of information such as press releases, annual reports and telegrams.
- In addition to this, we will interview people involved in company evaluations such as investors, creditors and researchers. This way we can try to assess what they would like to see in the standardized set of information to make a fair appraisal.

The reason for using a standardized set of information is obvious. If different sources were used for different companies it would be impossible to conduct a fair evaluation meaning that the rating would be highly subjective and therefore lack validity (we'll get back to this discussion in the methodology chapter). The future purpose of the model is (1) to create a model, which can be applied to any company by anyone using a standardized set of information, (2) to continuously collect data regarding companies' IC so that a just rating can be made taking changes into consideration, and (3) based on this continuous gathering of information, construct an IC rating list of all companies on the Stockholm Stock Exchange (SSE) that can be presented on a regular basis. With this study,

however, our intention is to apply the model using the standardized set of information gathered from a specified sample of companies. Analyzing the outcome, we should be able to rate the IC of the companies involved in the study during a set time period and test the hypothesis using those ratings.

1.2.3 Applicability of the model for ICAB

Worthwhile mentioning is that the model and the hypothesis testing of it, first and foremost is intended for the use of ICAB as our consignor. It is our aim that the model will be used by ICAB to market and complement their current rating tool. It is however true, as stated above, that the model will be constructed in a way making it possible for anyone to make an appraisal of any given company's IC.

1.2.4 Public information regarding Intellectual Capital

What, then, is information made public by an organization concerning its IC? Is it the smiling face of the CEO on the cover of a magazine? Is it the happy employees pictured in the annual report? Is it the willingness of the company to show up at fairs and workshops? Or is it a colossal ad posted on Times Square in New York? An often-quoted expression is that "all publicity is good publicity". Is that true? No matter whether it is true or not, how do you put a value on it? More importantly, who has access to the information? If a company, say Telia, posts an ad in a local newspaper in Östersund, can that ad be expected to be accessible to everybody on the market? Of course not! For these reasons as well as others it is of vital importance to decide what can be regarded as IC information accessible to everyone who wants to make an appraisal of an organization's IC.

1.2.5 Key issues

We face four key issues to deal with when we construct and apply our model:

1. Accessibility.
2. Quantification.
3. Weighting.
4. Trustworthiness.

Since the purpose of the model is that it should be applicable to any company by an outside observer, that observer has to be able to access the data considered necessary in the model. Therefore, one of the main issues is whether or not the data is available at all. It is quite possible that a large amount of the parameters that we intend to use in our model are not presented anywhere in the standardized set of information. If and how this should affect the company rating will have to be carefully considered. There may also be a difference between small and large firms regarding their publicly available IC-information. Although this is a reasonable assumption, it is contradicted by the fact that all the companies evaluated in this study are noted on the SSE. This implies that they most likely have the capacity to present sufficient material regarding their IC. Furthermore, when the necessary information is available, it is of utmost importance to evaluate the significance of the parameter. This coincides with issues number two and three above.

Suppose that data is available for a certain parameter. What determines if the value of that parameter is good or bad, high or low? Should an evaluation of a large organization differ from that of a small one? Can we expect different values depending on the market a company operates in? It would seem fair to expect a difference in average IT literacy among employees when comparing an IT-firm with a firm in a more traditional market, say manufacturing. But then again, how would we classify a company like Ericsson? IT? Manufacturer? In addition to this, a certain parameter may have a higher importance due to the market in which an

organization operates. In the long run, when a sufficient amount of firms have been rated, an industry (market) average may be a plausible suggestion for comparisons, but at present it would not be relevant.

The last issue raised above is that of trustworthiness. Considering the fact that a substantial amount of the information on which we base our evaluation originates from the company itself, how much faith can be put in the trustworthiness of those figures? We have chosen to divide the previously mentioned standardized set of information, on which we base our study, into primary and secondary information sources. Primary information is that, which is provided to us by the company itself while secondary information originates from sources outside the company. Examples of primary information sources are annual reports, press releases and the company home page on the Internet. Secondary information sources are newspapers, magazines and other Internet sites. Primary information must be evaluated with a great deal of cautiousness since information originating directly from the organization may very well be somewhat "polished" in the sense that the company wants to present themselves in the best way possible. However, it may be argued that management will not gain anything by withholding "bad" news from the public since, eventually, it is destined to come out somehow, and when it does management and the company will lose a lot of credit. In regard to our secondary sources, it is of vital importance to remain as objective and critical as possible so that sheer rumors do not affect our impression of the analyzed companies. Mats Larsson of KPA is under the impression that the information gathered from the primary sources should be given a higher grade of credibility.[24]

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[24] Interview, 001102.

1.3 Purpose

The purpose of this study is to test the hypothesis *the more transparent a company is, with regards to its Intellectual Capital, the less volatile its market value will be*. To test this hypothesis we intend to do three things:

1. **Develop a model** with which it is possible to grade a public company's Intellectual Capital using only publicly available relevant information.
2. Applying this model to a number of companies on the Stockholm Stock Exchange in order to **rate the accessibility and quality** of their Intellectual Capital.
3. Relating each company's score to the **volatility** of its stock price during a specified period of time.

1.4 Delimitations

Due to the limited amount of time at our disposal we have been forced to limit the study in a number of ways. It is important that the reader always bears in mind these boundaries and the implications that they are accompanied by. Other restrictions have been caused by the lack of previous and comparative material, an aspect that has prevented us from making valid and well-founded statements. However, as long as the reader is aware of these confinements we see no problems with the choices that we have made.

First and foremost, we have limited the time period during which we have collected data. This was a necessity since the amount of material otherwise would have been too extensive for us to research. Therefore, the material on which our analysis is based is material that has been publicized between September 1st 1999 and August 31st 2000. The same time period has been used for the stock data collected. The reason for choosing this time period is that we wanted to cover the

four financial reports issued annually, and also incorporate material as up to date as possible   Furthermore we have limited this study to the Swedish IT/Internet consultancy industry. The reason is that this enables us to compare the companies to each other as opposed to what would be the case should the companies be active in different business environments. Yet another reason for the choice of industry is the development in the sector over the studied time period and the importance of IC in a consultancy. Within the IT/Internet consultancy business environment, we have had to constrain the study to seven companies purely as an effect of the deadline for the work.

1.5 Disposition

Chapter two will deal with the methodology used in the study. The working process will be thoroughly described. Chapter three is the theoretical framework on which we build our study. There you will find a brief description of the work conducted by Konrad-gruppen, Karl-Erik Sveiby, Leif Edvinsson and Sam Malone, the Swedish Public Relations Association and Intellectual Capital Sweden AB. For those who are familiar with the work of these people and organizations, it is plausible to skip that chapter. Chapter four is a description of the model and the thoughts that lay behind it. In the fifth chapter we will present our analysis of the seven companies as well as tying the companies and their respective ratings together. Furthermore, we will try to relate the ratings to the volatility data and put our hypothesis to the test. Chapter six is where we try to draw conclusions based on our analysis. We will also make suggestions for further research.

2 Methodology

In this chapter we will explain what we have done and why we have done it.

2.1 Choice of research approach - inductive or deductive

When performing a research project there are basically two ways of approaching it, using either inductive or deductive methods[25]. When using the inductive method the research starts with observing a phenomenon in reality and collecting empirical data. These observations should then be viewed and analyzed having relevant theory in mind and then one or more hypotheses about the observed phenomena can be created. The aim of such research is not to test any hypotheses, rather to create hypotheses for someone else to test. If the choice of research approach is the deductive method then hypotheses is created from theory. The hypotheses are then tested in reality with empirical data and are either possible to falsify or not.

2.1.1 Our approach

To start off we screened the field for relevant literature in order to form a theoretical framework and a general understanding of the subject. Having the theory in mind, a hypothesis was formed with the aid of Peder Hofman-Bang at Intellectual Capital Sweden AB. A model was then created and applied to a number of IT-companies to test our hypothesis. This makes our choice of method deductive.

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[25] Wiedersheim & Ericsson, 1991

2.2 Data collection

The data that has been used in the creation of this thesis can be broken down into two separate subgroups: primary and secondary data. Primary data is data that has been obtained by us as researchers and secondary data is data that has been previously obtained by others and has been made available through a number of channels such as literature, magazines, news archives, databases etc.

2.2.1 Primary sources

To collect our primary data we choose to conduct interviews. Using interviews is a technique that may be used in several different types of research projects, but any one project can be said to consist of mainly three elements: gathering of data, analysis of data, and decision. Carrying out an interview includes the first two elements[26]. The first step in the process of collecting our primary data was to contact the respondents via email and briefly describe what we were doing and why we needed their inputs. When we later met with the respondents, we started off by introducing our research study, this to enhance the respondent's understanding of the problems we were facing. The choice of interview method fell on the partially structured in which the interviewer poses a few predetermined questions but has considerable flexibility concerning follow up questions.[27] A number of questions were asked and the respondents were allowed to speak freely given the framework set by our questions. The choice of letting the respondents speak freely was made mainly because we did not want to let any important information slip by us by restricting the respondent's answers to a predefined set. The respondents were chosen because of their insight into our field of interest and they all contributed significantly to our broadened understanding of the topic.

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[26] Gordon, 1970.
[27] Frykman & Tolleryd, 1999.

2.2.2 Secondary sources

As a start to our process of writing this thesis a thorough screening for relevant material was carried out. Since the field by no means is fully explored the amount of available material is also limited but we believe that we have gained a good insight into the topic of visualizing IC through books, magazines, news archives, and Internet homepages. Most of the theory providing the building blocks for our model to rate IC using publicly available information comes from a few selected sources and these will be thoroughly presented in the theory section. Our ultimate source of information is ICAB's rating tool IC Rating^{TM}, which in its case has been generated from mostly the same theoretical framework that has been used in this study.

2.3 Generating the model

With the IC Rating^{TM} tool as well as the other relevant theory in mind as a backbone we set out to formulate the parameters that go into our model to rate IC based on public information. Since some of the parameters that can be found in both IC Rating^{TM} (these will not be presented for reasons of confidentiality) and the ones that make up the Skandia Navigator and the Intangible Asset Monitor require inside information, changes had to be made so that new parameters could be formulated. It was not just a matter of what kind of information we expected to find when analyzing our sample companies but also about what was actually communicated. See chapter 4 for an in depth description of the model.

2.4 Data going into the model

Because of the restrictions in time we chose to include information released between September 1st 1999 and August 31st 2000. Data that has been used includes material with origin from the analyzed companies, namely annual reports, quarterly reports, and press releases, as well as their respective homepages on the web. Data going into the model originating outside the companies has been collected through a database called Affärsdata[28]. Through this database we have had access to all material written about the companies over the time period in a large number of magazines, periodicals and news agencies. We chose to use the magazines/newspapers: Affärsvärlden, Computer Sweden, Dagens Industri, Finanstidningen, Månadens Affärer, Privata Affärer and Veckans Affärer. The news agency of choice has been Nyhetsbyrån Direkt. Through these channels of information we feel that we have covered most of the relevant information released. We have incorporated all information released from the companies of investigation, the written material coming from all the major business magazines, and the news telegrams coming from Nyhetsbyrån Direkt (which in its case covers news agencies Hugin and Bit).

2.5 Sample of companies

At first it was our intention to include companies from a variety of industries, this because it was our intention to create a model that is so general that it can be applied to any company, regardless of industry. Over the course of time, however, it became evident that we had to restrict ourselves to one industry in order to facilitate inter-company comparisons. According to Roos et al[29], companies operating in totally different industries will have very few measures that best represent their IC in common, and thus comparisons seem meaningless.

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[28] www.ad.se.

Companies operating within the IT-industry are to a large extent reliant on their IC as a vehicle for future success. Therefore we found it appropriate to analyze companies from this industry and apply our model in order to test whether or not transparency has an impact on market value volatility. The companies that were selected are all IT/Internet-consultants. Selecting a completely homogeneous group of companies is impossible because of different focuses in regards of markets served, line of services etc. but we feel that our selected companies are representative of the above mentioned business area. The chosen companies are IMS, MSC, WM-Data, Softronic, Prevas, RKS, and KnowIT.

2.6 Statistical references

To test our hypothesis of transparency and market value volatility, we have calculated the mean and standard deviation of the seven companies' shares on the Stockholm Stock Exchange[30]. This was done using the share prices during the time period chosen for our study (990901 – 000831) as published on the Affärsdata Internet home page[31]. The share prices were put in to an Excel sheet and Excel was also used to calculate the mean and standard deviation (volatility). The formulas most commonly used to calculate mean and standard deviation are the following.

$$Mean = \mu_Y = \frac{1}{N} \sum_{I=1}^{N} Y_I$$

Equation 2; Source: Graybill, Franklin A, Iyer, Hariharan K,

"Regression Analysis – Concepts and Applications"

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[29] Roos et al, 1997
[30] After a discussion with Claes Wihlborg concerning appropriate measures of volatility we chose standard deviation. Mr. Wihlborg's opinion was that this is the most widely accepted measure (Wihlborg, 2000).
[31] www.ad.se, 001105.

$$\text{Standard deviation} = \quad \sigma_Y = \sqrt{\frac{1}{N}\sum_{I=1}^{N}\left(Y_I - \mu_Y\right)^2}$$

Equation 3; Source: Graybill, Franklin A, Iyer, Hariharan K,

"Regression Analysis – Concepts and Applications"

2.6.1 The squared correlation coefficient (r^2_{xy})

The square of r_{xy} is called the *coefficient of determination (r^2_{xy})*. This coefficient can be interpreted as the proportion of variability in y that can be accounted for by knowing x, or the proportion of variability in x that can be accounted for by knowing y. In other words, if r_{xy} = .80 *then r^2_{xy} = 0.8^2 = 64%*. This means that 64% of the variance in one of the variables can be derived from the variance in the other one. The remaining 36% accounts for the variation not explained by the other variable.[32]

2.7 Overall quality of the research project

2.7.1 Information processing

A problem inherent in the process of writing a thesis is the processing of information. Due to the limitation in time and size of the thesis, a large fraction of the available information must be left out or negated, and therein lay one of the problems associated with the writing of this thesis. The large pool of information we started out with, and came across during the course of time, has been cut down, structured and processed and at last presented in the best way possible to meet our objectives. This process of gathering, reducing, structuring, and presenting

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[32] Lundqvist, 2000.

information is what Sveiby calls *infoduction*[33]- from *info*rmation r*eduction* and pro*duction*. The infoduction that has taken place regarding the information that has been used to rate our sample companies will be laid out in chapter 4. Most jobs today involve some variant of information processing. It is however not likely that a given set of information will result in identical reports if two separate persons were to perform the study. However objective one tries to be, it is unattainable to leave out personal values, opinions, and beliefs based on the knowledge the person possesses and the environment she has been brought up in. The reader must at all time be aware of the impossibility of transferring the complete knowledge of the subject in the reduced form that this forum gives opportunity to.

2.7.2 Reliability

Reliability is a measure of the trustworthiness of the research in the sense that it can be carried out all over showing the same results. As this study incorporates data collected over a set period of time, the findings can only be representative for this time period. If this study were to be repeated using another time period, the results would probably be somewhat different. One aspect that arguably could reduce reliability are the researchers' subjective views and values when analyzing data and assigning grades to the different parameters. Using the same framework in the analysis of every company has reduced this subjectivity. With the above discussion in mind we believe that the overall reliability of the research project is moderate.

2.7.3 Validity

The meaning of validity is to what extent the research measures what it is supposed to measure. Since a large number of well established sources recognized for their insights in the field have been used in the creation of our model we

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[33] Sveiby, Karl-Erik, 1995.

believe that it measures what it is intended to measure. Information and data regarding the analyzed companies may naturally be somewhat polished. Also material originating outside the companies may carry traces of subjective views. Because of the large amounts of sources used we believe that we have a balanced view of the analyzed companies, resulting in an overall fairly high validity. For a further discussion concerning the validity of the model, turn to section 5.2.4.

2.7.4 Criticism of the research project

- The group of analyzed companies cannot be said to be representative of the whole population of IT/Internet-consultants since they were not randomly chosen. The group is also fairly small making it hazardous to generalize about the whole population of IT/Internet-consultants based on the results found in this study.
- Measurements of volatility: Some argue, and that may very well be the case, that stock market prices have been driven more by psychological reasons than fundamental over the past year. Therefore it would have been very interesting to use other complementary measures for volatility, i.e. look at how value added has varied over time. The time period of one year is however too short to carry out such measurement, and other hypotheses also have to be formulated.
- It is impossible to determine the degree of a shift in stock price that is induced by non-financial information but as previously discussed in the problem discussion, as much as 95 percent of stock volatility could be induced by non-financial information.

3 Theoretical framework

In this chapter we will introduce the relevant material upon which we build our model. In chronological order we will present the work of the Konrad Group, Karl-Erik Sveiby, Leif Edvinsson and Skandia, the Swedish Public Relations Association and, finally, Intellectual Capital Sweden AB. If the reader is already familiar with this material, it is quite possible to skip this section and go straight to the next chapter. The reason for our thorough examination of the material is the fact that the model that we have created is, to a large extent, based on the theories presented in this chapter.

3.1 The Konrad Group

The following section is based on the book "Den osynliga balansräkningen" written by the Konrad Group.

When screening the material written on the subject of IC the first, in terms of chronology, document that seems to have appeared is "Den Osynliga Balansräkningen"(The Invisible Balance Sheet - authors translation) issued by The Konrad Group in January 1988. This document is to our knowledge the first attempt, as previously mentioned in the introduction, of developing a model and guidelines intended to describe and visualize a company's IC. The model was later on extended and further developed by Karl-Erik Sveiby, one of the co-authors of "Den Osynliga Balansräkningen", resulting in the Intangible Asset Monitor. The IAM will be thoroughly explained later on, so there is no point in explaining all the indicators developed by the Konrad Group, most of them will appear in the IAM anyway. It is however worthwhile to briefly explain the general structure and trait of thought used by the Konrad Group as they developed their model. The group states that they perceive an organization as comprised of two kinds of capital: 1) the traditional financial capital and 2) the knowledge capital. The

knowledge capital can be further broken down into subgroups but from the external analysts' perspective, and that is the perspective the group took, those types interesting are the individually owned knowledge capital and the organizationally owned knowledge capital. The aggregate knowledge capital an organization possesses is built up of the structural capital (organizationally owned) on the one hand and the total knowledge acquired by its employees on the other hand.

Figure 1; Knowledge capital; The knowledge capital is divided into individual capital and structural capital. Individual capital is knowledge that is professionally directed and bound to the individual. Structural capital is all other competence within the organization

Structural capital
- Individual administrative ability
- Knowledge and education possessed by the administrative personnel
- Management's network
- Management's individual ability

- Administrative routines
- Networks developed with authorities
- Administrative computer systems
- Handbooks

Individual capital

- Education
- Professional experience
- Individual reputation
- Personal relations to customers and co-workers

- Handbooks
- Conceptual models
- Supporting computer systems
- Customer network
- Organizational image

3.1.1 The individually owned knowledge capital

The individually owned knowledge capital is, in the words of the Konrad group, the employees' individual personal and social skills, experience, education related knowledge, and other skills adding value to the end customer. These skills make

up a person's competence and are closely related to the ability of solving complex problems. Employees possessing these skills are in the book called professionals or revenue generating employees. Their tasks are first and foremost designed to generate as much revenue as possible. These professionals are obviously not the only ones with business critical competence. All other departments, such as the finance department and all other supporting functions of an organization are of utmost importance but they do not generate revenue directly, rather focus on developing the internal structure of the organization.

3.1.2 Structural capital - the competence of an organization

All organizations have their own experiences and history, documented in handbooks, computer software and "toolboxes" with fine-tuned concepts intended to solve whatever problem their customers may have. These experiences belong to the organization rather than to individuals (even though individuals have developed the concepts). Here are distribution channels to suppliers, customers and other sources of knowledge that do not adhere to any single individual but rather to the position the organization has on the market or to its history. Other examples of structural capital are purely administrative by nature, such as payment procedures and the building blocks of the internal organization. Commonly used phrases to describe structural capital are "the way we do things here", "it is in the walls and surrounds us at all times" etc.

As a summary we can say that the Konrad group identified two types of knowledge capital: the individually owned that is intended to generate revenues and the organizationally owned structural capital that more serves as supporting functions. The Konrad group focused on knowledge intensive companies only as they developed their method of visualizing and describing the downside risks and upside potentials inherent in a company's hidden assets. That distinction between knowledge intensive and not so knowledge intensive companies was maybe more relevant earlier on but nowadays no organization should be left out, they are all to some degree using their IC to generate profits and therefore it is also relevant to

analyze and visualize their IC. Later models, such as the Skandia Navigator that will be presented in section 3.3, have also been constructed or can be modified such that companies not traditionally perceived as knowledge intensive can be analyzed.

3.2 Sveiby

This section is a review of the two books "Kunskapsflödet- Organisationens immateriella tillgångar" and "The New Organizational Wealth", both written by Karl-Erik Sveiby.

In both *Kunskapsflödet- Organisationens immateriella tillgångar* and *The New Organizational Wealth*, Sveib*y* argue*s* for a tool to measure a knowledge intensive company's intangible assets, that is its intellectual capital. He divides the intangible assets into three categories- *external structure, internal structure,* and *competence*. Before going into the specifics of the above categories that make up the *Intangible Asset Monitor* one has to stop and reflect over why there is a need for these intangible assets to be visualized and to whom it might be interesting. According to Sveiby there are two main purposes and two target groups:

- *External statement:* Presentation of the company to external customers, credit institutes or shareholders in order for them to build an understanding of the overall quality of the company.
- *Internal assessment:* A means for management to survey the company so that correctional actions may be undertaken before it is too late.

As of today both purposes may be fulfilled using the double bookkeeping, but there is one serious drawback- balance sheets, income statements etc are in monetary terms and therefore it is impossible to discern relevant flows in organizations whose assets to a major part are non-monetary and intangible. With this in mind Sveiby set out to construct a model that could measure and visualize intellectual capital. The result was *The Intangible Asset Monitor*. The previously

mentioned categories**,** *external structure, internal structure, and competence* are further broken down into **indicators of growth/renewal, indicators of efficiency, and indicators of stability,** see table below.

Table 1; Sveiby's Intangible Asset Monitor indicators. Source: Sveiby, 1997.

External Structure Indicators	Internal Structure Indicators	Competence Indicators
Indicators of growth/ Renewal	**Indicators of growth/ Renewal**	**Indicators of growth/ Renewal**
1. Profitability/customer 2. Organic growth 3. Image enhancing customers	1. Investment in the internal structure 2. Investments in IT 3. Structure enhancing customers	1. Number of years In the profession 2. Level of education 3. Training and education costs 4. Marking 5. Competence turnover 6. Competence-enhancing customers
Indicators of efficiency	**Indicators of efficiency**	**Indicators of efficiency**
1. Satisfied customer Index 2. Sales per customer 3. Win/loss index	1. Proportion of support staff 2. Values/attitudes index	1. Proportion of professionals 2. Leverage effect 3. Value added per employee 4. Value added per professional 5. Profit per employee 6. Profit per professional
Indicators of stability	**Indicators of stability**	**Indicators of stability**
1. Proportion of big Customers 2. Age structure 3. Devoted customers Ratio 4. Frequency of repeat orders	1. Age of organization 2. Support staff Turnover 3. Rookie ratio, Seniority	1. Professionals turnover 2. Relative pay 3. Seniority 4. Age structure

3.2.1 External structure

Professionals in knowledge intensive businesses spend a majority of their time, maybe as much as 90%, in close cooperation with their customers, so the choice of customer is certainly crucial. To be able to pick the raisins out of the cookie Sveiby argues that customers should be grouped by category. By doing so, information about changes in customer structure can be captured and that is a very useful input for an assessment of the company's potential development.

3.2.1.1 Indicators of growth/renewal

Profitability per customer- Sveiby states that there is surprisingly little information on customer profitability. He further argues that customer profitability should be monitored routinely. Companies that have made an effort to find out customer profitability have disgruntled found that up to 80% of their customer sales are not profitable.

Organic growth- Organic growth, i.e. increase in billings with income from acquisitions deducted, is a measure of how well your business concept is received by the market. Here it is important to note that an increase in revenues caused by acquisitions is not necessarily a sign of success.

3.2.1.2 Indicators of efficiency

Satisfied customer index- Measuring the degree of customer satisfaction is perhaps the best way to get an early indication of whether results are about to improve or deteriorate.

Win/loss index- Companies that get a lot of their business from tenders, can calculate a simple index by comparing how many of their quotations that were successful with how many that they lost. Compared over time this gives a good indication of how their customers regard them.

Sales per customer- Sales per customer is defined as total sales divided by the total number of customers. Since selling more to the same customer is usually easier and less costly than finding a new customer, this ratio tells how efficient your company's existing network of customers is.

3.2.1.3 Indicators of Stability

Proportion of big customers- This index tells you how dependent your company is on the favor of a few large customers. Worth pointing out is that if the degree of dependence is great, then your company's position is weak and so is its structure.

Age structure- The age structure of your customers is interesting to note in that the longer a customer has been with you, the better your relation probably is and the easier it ought to be to keep that particular customer.

Devoted customers ratio- The proportion of sales coming from customers older than, for example, five years indicates how devoted your customers are and is therefore a sign of stability.

Frequency of repeat orders- Another indicator of customer stability is the frequency of repeat orders. Naturally a high frequency indicates that customers are satisfied with the company.

3.2.2 Internal structure

The main activity of employees who work in general management administration, accounting, personnel, reception, filing, etc is to maintain the internal structure of the company according to Sveiby. He calls them support staff. Indicators of the internal structure are as follows.

3.2.2.1 Indicators of growth/renewal

Investments in the internal structure- Examples of investments aimed at building up the internal structure are new subsidiaries or new methods and systems. The indicator can be calculated as a proportion of sales or percentage of value added.

Investments in information processing systems- Investments in IT influences the internal structure and for many companies such investments are a prerequisite for future survival. IT investments, expressed as percentages of turnover or in absolute figures can provide valuable clues to how the internal structure is

developing. The number of computers and/or other IT packages per person can also be used as a control figure.

Customers that contribute to internal structure- The proportion of assignments devoted to customers that improve the internal structure of the company is an important variable since it adds to the growth of the asset. Projects that result in the passing of large chunks of competence to several professionals at once are especially important to the company.

3.2.2.2 Indicators of efficiency

Proportion of support staff- Proportion of support staff of the total number of employed indicates efficiency of the internal structure. A change in the proportion indicates whether the efficiency is improving or not.

Values and attitude measurements- A value judgment that is useful for a company to know is its employees' attitudes towards the workplace, customers and superiors. If those attitudes are favorable, they contribute consciously or unconsciously to enhancing the company's image among its customers.

3.2.2.3 Indictors of stability

Age of the organization- Sveiby states that an old organization generally is more stable than a new one. The age of an organization can very easily be compared to competitors and potential customers can draw their own conclusions from that.

Support staff turnover- It is vital for the survival and efficiency of any company that its support staff and managers function well since they are the backbone of the company. The turnover ratio should be monitored and if possible be kept within a band in order to maintain the stability of the internal structure.

Rookie ratio and seniority- These two ratios are each others' complements and both of them can be used. If the objective of the company is to maintain its stability, then the rookie ratio should be kept rather low since rookies are more likely to leave the company than employees with higher seniority. Rookies also tend to be less efficient because they have not yet socialized into the tradition of the organization.

3.2.3 Competence

Sveiby distinguishes between administrative personnel and experts since they contribute very differently to a company's performance. Experts are those that plan, produce, and present the final products/services to the customer. Administrative personnel are those that perform supporting activities such as reception, administration, and finances. Most of the administrative personnel are experts in their respective fields but Sveiby does not account for them under *competence* but rather *internal structure*. Indicators of competence can of course be modified based on what business you are in, but below those that Sveiby found appropriate are presented.

3.2.3.1 Indicators of growth/renewal

Number of years in the profession- Total number of years in the profession is a measure of the skill and experience of a company's whole body of professionals, whereas professional experience per professional is a measure of the average skill and experience of each of them. The most important measure of a company's level of competence and its development, according to Sveiby, is the change in average experience per expert.

Level of education- The level of education of professionals affects the assessment of the quality of their competence and thus the knowledge company's ability to achieve future success.

Training and education costs- Since knowledge companies depend so heavily on the competence of their employees, those companies have to invest large sums in the competence development of its professionals. Although the cost of training is not always visible because a large portion of the education takes place in projects/assignments for customers, Sveiby believes that it is still worth recording. He suggests control figures such as training costs as a percentage of turnover, number of days devoted to education per professional.

Marking- Sveiby advocates marking of professionals as well as executives. Awarding marks is rather rare in most companies but there is an advantage of doing so in that you can trace, using statistical methods, how competencies

develops in various fields, how it changes with time, affects personnel turnover etc.

Competence turnover- By comparing the competence of people who have left the company with those of new recruits, you can derive a quotient showing how personnel turnover affects the company's competence as a whole.

Competence enhancing customers- Since professionals spend most of their time working for customers, and since customers are the most important source of competence development, you get valuable information by measuring the proportion of customer assignments that contribute to competence development.

3.2.3.2 Indicators of efficiency

Proportion of professionals in the company- A key indicator of efficiency is the proportion of professionals in the firm; the number of professionals, divided by the total number of employees. Useful comparisons can only be made between companies within the same business since the proportion of professionals varies substantially from one business to another.

The leverage effect- This indicator shows the importance of a company's in-house professionals to its ability to generate revenue.

Value added per employee- Sveiby believes that value added per employee is a more reliable indicator of efficiency than for example turnover or profit per employee, this is because profit figures are easily manipulated and turnover takes account for goods/services that just pass through the company, without any value being added.

Value added per professional- In knowledge companies, value added per professional can be regarded as the "purest" measure of ability to produce economic value. It is the professionals, using Sveiby's definition, who bring in all the revenues. These revenues must then cover all the costs incurred in keeping a professional in the field (travel, office, secretary, management and administrative staff), and he himself of course also commands a market price in the form of salary, pension and other emoluments.

Profits per professional- Profit figures are rather easily available to external viewers and relevant comparisons between for example stock market- quoted

knowledge companies may therefore be carried out. In the long term, it is first and foremost the ability of the professionals to generate profits that determines the market value of a knowledge company. Profit per professional may thus be a more interesting indicator to note, especially for outsiders who do not have access to the internal management information.

3.2.3.3 Indicators of stability

Average age- Older people are, in general, less inclined to leave the company as compared to younger employees, thus the age structure is a good indicator of stability. It is also, just like turnover and seniority, an indicator of dynamics. A very high average age indicates a stable company with more wisdom than drive. It is possible to maintain a stable age structure using a deliberate recruitment policy, but keeping the age and the experience of the staff in balance is not easy.

Seniority- Seniority is defined as the number of years employed in the same organization. The seniority of professionals can be used as an indicator of stability of competence.

Relative pay position- Most industries and professional bodies keep good statistics of levels of pay and the relative positions of individual companies. Relative pay position is usually expressed in percentage terms and has high value because it measures relative cost levels compared to competition. It can also be assumed to influence the attitudes of professionals on their payroll.

Professional turnover rate- Staff turnover is regarded as an indicator of stability and it is also easy to calculate and compare with competitors. A   very low turnover suggests a stable but not dynamic situation whereas a very high turnover rate usually suggests that people are dissatisfied. Turnover should be kept in a band and sudden changes in the turnover rate are usually an indication that something has changed internally in the company.

3.3 Leif Edvinsson and The Skandia Navigator

This section is based on the book "Intellectual Capital – Realizing your company's value by finding its hidden roots" by Edvinsson and Malone.

Leif Edvinsson and a team of experts within the Swedish insurance company Skandia constructed the Skandia Navigator during the early 1990s, as a response to the growing debate surrounding IC at the time. In September 1991 Edvinsson was assigned as IC director at Skandia and throughout 1992 he, together with his "virtual teams", set out to define the basic character of IC. This resulted in three fundamental insights:

1. IC is supplementary, not subordinate, information to financial information.
2. IC is non-financial capital and represents the hidden gap between market value and book value.
3. IC is a debt issue, not an asset issue.

The third insight is worth mentioning since it means that IC is a debt issue and therefore is similar to equity in the sense that **it is borrowed from the stakeholders**, such as customers, employees and so on.

Edvinsson and the IC team were first put to the test when they applied their experiences to the Assurance and Financial Services (AFS) department of Skandia. They set the following goals for their work:

1. To identify and enhance the visibility and measurability of intangible and soft assets.
2. To capture and support packaging and accessibility by knowledge-sharing technology.
3. To cultivate and channel IC through professional development, training and IT networking.

4. To capitalize and leverage by adding value through faster recycling of knowledge and increased commercialized transfer of skills and applied expertise.

Their work with IC in Skandia AFS led the team to the following definition:

Human Capital + Structural Capital = Intellectual Capital

Equation 4; Source: Edvinsson & Malone, 1997.

Human Capital: the combined knowledge, skill, innovativeness and ability of the company's individual employees to meet the task at hand. It also includes the company's values, culture and philosophy. The company cannot own human capital.

Structural Capital: the hardware, software, databases, organizational structure, patents, trademarks and everything else in organizational capability that supports those employees' productivity – in a word, everything left at the office when the employees go home. Unlike human capital, structural capital can be owned and thereby traded.

Structural capital was then divided into *customer capital* and *organizational capital*. Organizational capital in turn, was divided into *innovation capital* and *process capital*.

Customer capital is the flow of relationships between a company and its current and potential customers.

Innovation capital attempts to cast outward into the immediate future by establishing what things the company is doing now to best prepare itself to grasp future opportunities.

Process capital, finally, deals with the role of technology as a tool for supporting overall enterprise value creation.

These components were then visualized, joined by *financial capital* (=equity), in the *Skandia Market Value Scheme.* Together they comprise a company's market value, implying that IC can be derived once market value and financial capital have been asserted. This is of course the meaning of the second fundamental insight mentioned above.

Figure 2; Skandia Market Value Scheme. Source: Edvinsson and Malone, 1997.
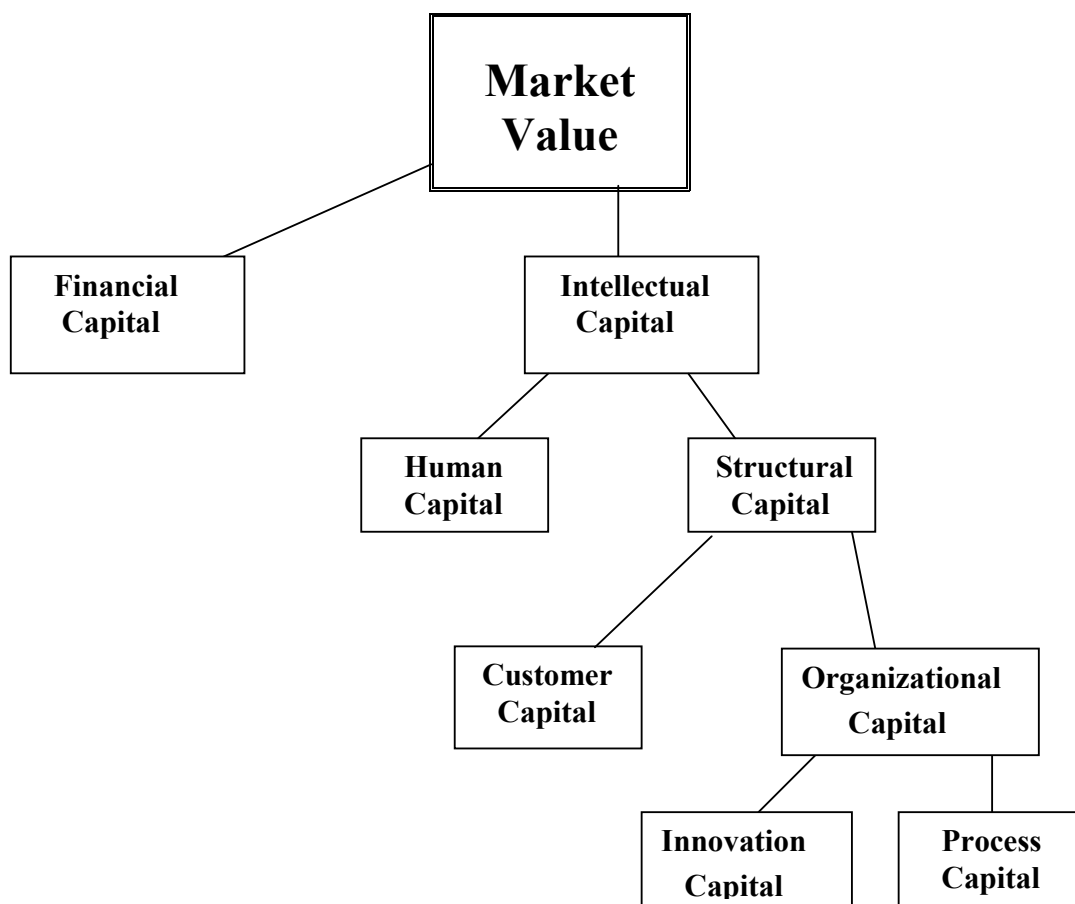
With the Skandia Market Value Scheme, Edvinsson and his co-workers had fulfilled their first objective: *valuation*. However, from the very beginning they had set out to try and create a model that targeted both valuation and *navigation,* says Edvinsson and Malone *"navigation is a different matter altogether"*. What was needed was a "tool" that could tie together and visualize the five areas of focus in IC and show how they interact as well as relate them to each other in time. The purpose that the Skandia Navigator served was twofold. Firstly, it served as a development tool for its designers. Secondly, it took on the function as an organizer and guide to its users.

Figure 3; The Skandia Navigator. Source: Edvinsson and Malone, 1997.
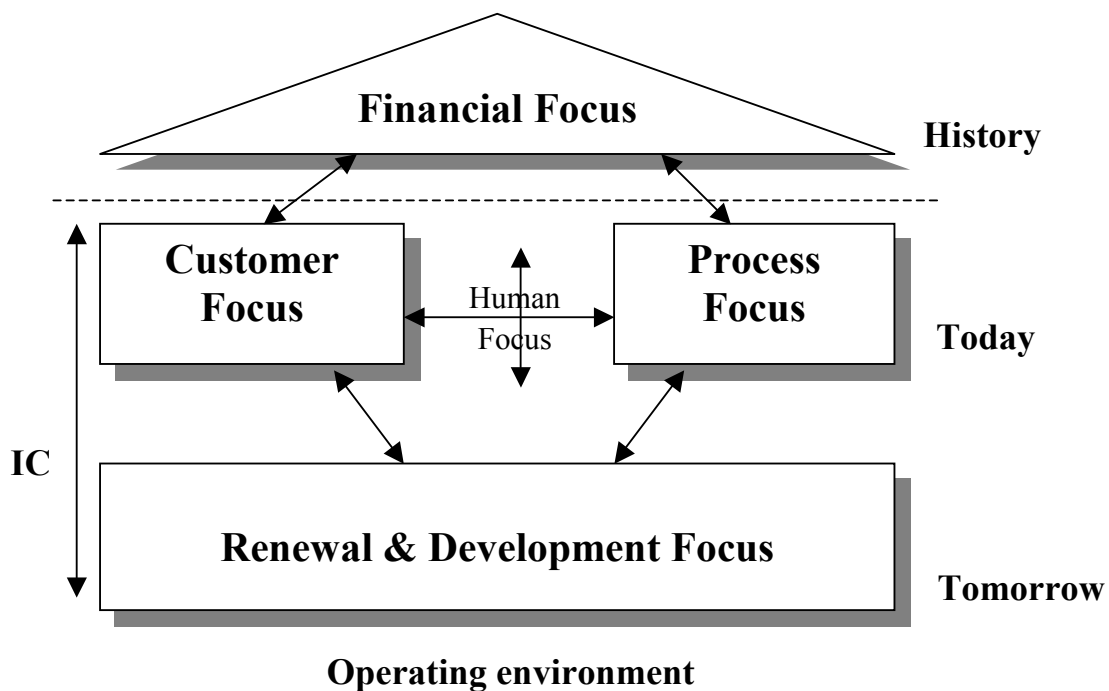
Two things are instantly realized when we observe the Navigator. It is not composed of types of capital but rather of five areas of focus. Furthermore, the shape of the Navigator is that of a house where the *financial focus* is the top story. The financial focus is the balance sheet and represents the past of the firm. Moving downwards in the "house", we come to the "walls", they consist

of *customer focus* and *process focus,* the former measuring a distinct type of IC, the latter measuring a larger part of structural capital. These two represent the present. The last of the building blocks looks at the future and is the *renewal and development focus*. As can be seen above, the heart of the Navigator is the *human focus* and rightfully so. This is the focus that interacts and touches upon all the other IC areas and it is also the part of the company that goes home every day.

3.3.1 Financial Focus

No matter which company and what actions they take, in the end these actions must lead to the creation of value in a monetary form. The value creating process may take years or just minutes, but at some point in time they must turn into revenues for the organization. This development can be followed through the Navigator as it is being processed. Starting from the foundation created by the renewal & development focus, passing through the process and customer focus and then eventually generating financial benefits to the enterprise. These are a few of the indices suggested by Edvinsson and Malone to measure the financial focus (unit of measurement):

- Total assets ($)
- Total assets/employee ($)
- Revenues/total assets (%)
- Revenues resulting from new business operations ($)
- Customer time/employee attendance (%)
- Revenues from new customers/total revenues (%)
- Market value ($)
- Value added/employee ($)
- IT expense/administrative expense (%)
- R&D investment ($)

3.3.2 Customer Focus

Edvinsson & Malone point to the fact that customers have changed dramatically over the years and so have the relationships a company has with

their customers. The value of a company's customers is defined as the present value of all customer relations. The indices on which the customer capital is based then, are those that capture the flow of relationships between the company and its customers. The following line of reasoning should be followed in order to be successful in these relationships:

I. Customer type – what is the profile of a typical customer for the company's product?

II. Customer duration – what is the turnover rate of the current customer base and what is the average time a customer is loyal?

III. Customer role – what role does the customer play in product design, manufacture, delivery etc.?

IV. Customer support – what independent programs, facilities and technologies are in place to assure the highest level of customer satisfaction and success?

V. Customer success – what are the levels of customer success according to such metrics as annual purchase rate, customers with and without complaints, gender, income etc.?

Edvinsson & Malone advocates the following indices:

- Market share (%)
- Number of customers (#)
- Annual sales/customer ($)
- Customers lost (#)
- Average duration of customer relationship (#)
- Customer visits to the company (#)

- Days spent visiting customers (#)
- Customers/employees (#)
- Average time from customer contact to sales response (#)
- Satisfied customer index (%)
- Customer IT literacy (%)
- Support expense/customer ($)

3.3.3 Process focus

Process focus deals with the role of technology as a tool for supporting overall enterprise value creation. It is the sum of all supporting processes created in an

organization such as IT systems, networks, archives and general working processes. Edvinsson & Malone point to several problems of these processes that may bring a company down. Choosing the wrong technology, installing the wrong/losing systems, applying the technology in the wrong fashion or having an incorrect company philosophy. Their proposed solution is to develop indices that account for these flaws, indices that; (1) value acquired process technologies only when they contribute to the value of the firm, (2) track the age and current vendor support for company process technology, (3) measure not only process performance specifications but actual value contribution to corporate productivity, and (4) incorporate an index of process performance in relation to established process performance goals. Furthermore, they present the following indices to deal with these issues:

- Administrative expense/managed assets (#)
- Contracts filed without error (#)
- PCs/employee (#)

- Administrative expense/employee ($)
- IT staff/total staff (%)
- IT capacity (#)
- IT capacity/employee (#)

3.3.4 Renewal and development focus

As can be seen in the Navigator model, the renewal and development focus lies at the opposite end from the financial focus. That is, while financial focus is a reflection of the past, renewal and development focus looks in to the future trying to ascertain how the organization best can prepare itself for upcoming business opportunities. Edvinsson & Malone presents six perspectives, which should be considered in order for an enterprise to ready itself for a successful future:

1. Customers
2. Attractiveness to the market
3. Products and Services
4. Strategic partners
5. Infrastructure
6. Employees

In order to cover these different perspectives, they then propose indices of which the following are a selection:

- Competence development expense/employee ($)
- Renewal expense/customer ($)
- R&D expense/administrative expense
- Training expense/employee ($)
- Training expense/administrative expense (%)
- Share of employees under the age of 40 (%)
- R&D resources/total resources (%)

- Non-product related expense/customer/year ($)
- New markets development investment ($)
- Employees based at partners' facilities (#)
- New products currently in development (#)
- Number of company patents (#)

3.3.5 Human focus

Finally then we come to the most vital area of IC and the Skandia Navigator. Human focus is intentionally put in the center of the Navigator due to the fact that it interacts with all the other areas in a very vivid manner. Edvinsson & Malone delve into the changing nature of the traditional worker. They split the labor force into a number of categories so that interesting indices can be created from these subpopulations. *Office goers* are distinguished from *telecommuters, road warriors* and *corporate gypsies* and the specifics of each are thoroughly scrutinized. The following indices are some of those suggested for measuring the human focus:

- Leadership index (%)
- Motivation index (%)
- Employee turnover (%)
- Average years of service with company (#)
- Number of female managers (#)
- Share of employees under the age of 40 (#)

- Full time employees who spend less than 50 % of work hours at a corporate facility (%)
- Percentage of company managers with advanced business degree

3.4 R.O.C.

The following part is based on the report "Return On Communications" issued by the Swedish Public Relations Association.

In 1995, after having recognized a need for a new way of communicating the hidden values of a company, the Swedish Public Relations Association (Sveriges Informationsförening) initiated the project R.O.C.- Return On Communications. 11 major member companies joined the project that aimed at "opening up new thought processes to build bridges between the soft values that communicators help build and the values reported in traditional accounting. Another goal of the project was to build a method, a work process, and a range of qualitative/quantitative performance measurements to help a company evaluate how communication contributes to the company's profits, and, in a longer perspective, to its value.

The R.O.C. model separates organizations into five segments that, for illustrative reasons, can be seen as the components of a boat propeller. Top management is the shaft of the propeller and the four surrounding blades that drive the organization forward are community, market, employees and owners/investors respectively.

What separates R.O.C. from both Sveiby's IAM and Edvinsson's Navigator is that the R.O.C. distinctly differentiates between individually owned and company owned intangible assets. Some non-material assets rest in systems, patents, contracts etc. These are structural by nature and clearly owned by the company, even after closing time. Individually owned intangible assets such as know-how, personal networks etc on the other hand, walk out the door at 5 p.m. and might not come back. Obviously there is an incentive for management to transform as much as possible of the individually owned intangible assets to company owned. Below you can see an illustration of the division of non-material assets into individually- and company owned.

Table 2; Non-material assets. Source: The Swedish Public Relations Association, 1996

	Individual	**Company-owned**
The market, customers, suppliers **M**	**MI**	**MC**
Investors and financial categories **F**	**FI**	**FC**
Employees **E**	**EI**	**EC**
Community **C**	**CI**	**CC**
Leadership, strategies, visions **L**	**LI**	**LC**

3.4.1 Explanations and examples of non-material asset categories:

Individually owned market capital, MI, includes the star salesman whose personal relationship with his clients is so strong that they would never even consider buying without at least giving the salesman a chance to make a proposal.
Company-owned market capital, MC, includes customer databases, established links between the clients and the company, e.g. through customer magazines, and a strong corporate brand position, a "brand image".

FI assets may be the bright investor-relations person who has built up his personal network with analysts, financial journalists and other financial opinion builders.
FC assets include confidence in the company as such, the information it provides and the strategies and visions of corporate management.

EI assets would include individuals, wherever they are in the company, not least in training and human resource management.

EC assets could be well-conceived motivation and training programs, decentralization and empowerment programs, good systems for internal communications and a strong corporate culture.

CI assets are good personal contacts between company leaders and the political environment, the individuals who have direct access to the community opinion builders.

CC assets could be clear policies on politically important issues, established processes and traditions for regular contacts between a company and its political environment, and e.g. well thought out and developed programs for crisis management.

LI assets can be a strong individual in the company's management, the Jack Welches, Lou Gerstners and Percy Barneviks of this world.

LC assets are clear visions, strategies and goals, shared with and endorsed by the employees and others concerned, and an accepted corporate culture, "the way we do things here".

3.4.2 Results of the project

The results of the project represented a new approach, in the words of the Swedish Public Relations Association, to how a company's total value is created. The method and the performance measurements can be applied to most companies after company specific modifications. Three concrete outcomes were:

1. A new way to concretize and describe the non-material assets in a company.
2. Illustrations of how communication contributes to the creation and development of these assets.
3. Four tools in the process; 1) *a structure* utilizing a classical communications model with leadership, visions, strategies and goals at the center and, around the center, the four key audiences: investors, the market, employees and community, 2) *a check* list which can be used in a benchmarking process or in other analyses of company strengths and weaknesses, 3) *a*

range of selected performance measurements, expressing the assets in measurable terms, 4) *"value links"*- a goal oriented, step by step process, where the performance measurements are linked in a way that features the connection between non-material assets and company profit factors.

3.5 IC Rating^{TM}

The following segment will present the conceptual framework used by Intellectual Capital Sweden AB in order for them to rate a company's Intellectual Capital. Due to confidentiality reasons, a complete explanation is not possible but the overall structure and idea is still understandable. It is based on a previous study written by John Lundqvist titled "Intellectual Capital in information technology companies – A correlational study of IC Rating^{TM} and variables measuring growth and profitability" and on the company's Internet home page, www.intellectualcapital.se.

As mentioned earlier, ICAB was founded in 1997 on the initiative of Leif Edvinsson and A-Com. With thoughts and theories of intellectual capital as a starting point, a model for valuation of knowledge-based companies has been constructed. From this model, a tool has been developed - IC Rating^{TM} - which measures intellectual capital and makes it comparable between companies and between units within a company. IC Rating^{TM} has been validated through empirical analyses of a large number of companies within IT, finance, communication, media and management consulting. During the spring of 2000, Mr Lundqvist performed his university study to test the validity of IC Rating^{TM}. The results provided further support for the validity.[34] The IC Rating^{TM} model originates from the previously presented models. Due to constant developments the conceptual framework of the model has changed somewhat from when it was first applied and today it is depicted as follows.

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[34] The complete study can be found on ICAB's Internet home page, www.intellectualcapital.se

Figure 4; The conceptual framework of Intellectual Capital Sweden AB. Source: ICAB Internet home page. Authors remake.
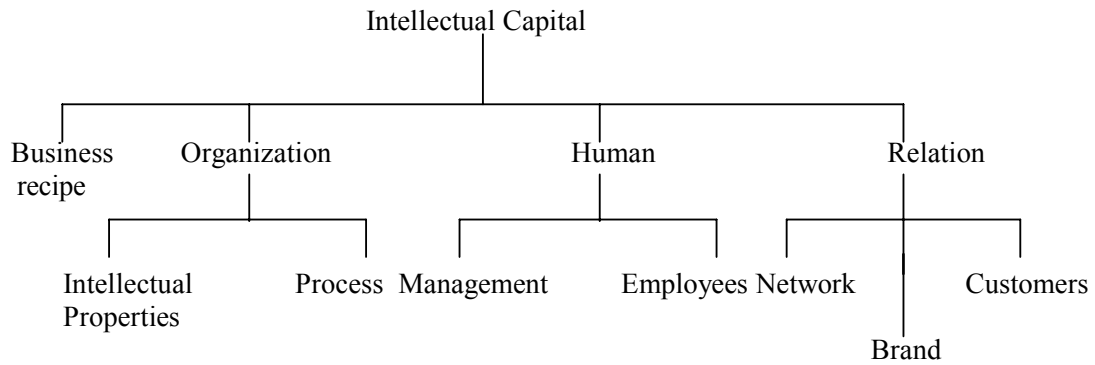
As can be seen above, the model resembles The Navigator developed by Mr. Edvinsson et al but with some alterations. First and foremost, an IC Rating^{TM} does not in any way deal with the aspects of the financial capital, which was one of the focuses in the Navigator. The idea of splitting structural capital into an external (here denoted Relational structural capital) and an internal part (Organizational structural capital) originates from Sveiby's Intangible Asset Monitor. Business recipe has since been added to the original model due to the constant changes of the model as experiences are made and a deeper understanding is gained. The four overall areas under examination are these:

- *Business recipe;* consists of the company's business idea and strategy in combination with the conditions in the chosen business environment
- *Organizational structural capital;* consists of intellectual properties (patents, license agreements etc) and the support systems and structures which form the process capital
- *Human capital;* includes the competence, capacity and traits of the management and the personnel

- ***Relational structural capital;*** consists of relations to different interest groups, i.e. potential and satisfaction of the customers and suppliers

3.5.1 Methodology

IC Rating^{TM} is based upon data collected from internal as well as external interest groups related to the company, i.e. quantifiable interviews with management, employees, customers and suppliers etc. The selection of respondents is based upon every specific respondent's knowledge of the company and its competition, in the business environment. The time required to carry out an IC Rating^{TM} is approximately 6-8 weeks.

3.5.2 Result

The result of an IC Rating^{TM} is quantified measurements of the resources that are of critical importance for the company's long-term profitability. This result can be used as a foundation for change and also as a tool in daily activities. The results of an IC Rating^{TM} are presented from 3 different perspectives:

- An assessment of the present ***efficiency*** of the intellectual capital.
- An assessment of the company's efforts to ***renew and develop*** its intellectual capital.
- An assessment of the ***risk*** that the present efficiency will decrease.

The values are normally presented on a scale ranging from 0 to 100 or on a scale from D via C, CC, CCC, B, BB, BBB, A, AA, to AAA. The reason for the letter scale is the wide acceptance and use that it has gained in other economic relations, such as a credit rating.

3.5.3 Usage

IC Rating^{TM} is a measurement tool from a new perspective and with a new approach focus on the assets that in fact decide the ability of knowledge based companies to create value for their interest groups.

An IC Rating^{TM} provides management with a foundation for optimizing the competitiveness of the organization by functioning as:

- A foundation of a modern business control system with clear and measurable goals for maximizing future profitability. This analysis can be repeated in order to measure the goal achievement

- A basis for improvement and change activities that can be used on both management- and operational levels. The areas of improvement can be identified after which decisions about changes can be made

- A structured image of value creating assets that can be used in market communication (investor relations, annual reports) as well as within the organization, where the tool creates a new basis and a new language for internal aspects important to the business activity

- Since all measurements are performed by Intellectual Capital Sweden AB as an independent rating-company, IC Rating^{TM} legitimizes the valuation of the intellectual capital

3.6 Conclusion

In this chapter an attempt has been made to present the most widely recognized, to our knowledge, theories and models formulated with the intention of visualizing IC. It might be the case that we have missed some theories that would have brought value to this study but we feel that we have come across a majority of the most relevant theories due to the thoroughness of our literature review.

The reason for going through the theories/models so extensively is that our rating model, which will be laid out in the following chapter, is so deeply rooted in them. IC Rating^{TM}, which serves as a foundation to our model has in its case been developed mainly out of the work of Edvinsson & Malone (1997) with some parts taken from Sveiby (1997) and the R.O.C. project (1996). Worthwhile to stress once again is that the indicators/parameters that are used in the above mentioned models rely on the access to internal information. The companies are assessed from within, whereas we use an external perspective. Besides the shift in perspective from internal to external, the reader will find out in the following chapter that our rating model has very much in common with them, especially IC Rating^{TM}.

4 Rating Model

In this chapter we will describe our rating model and how a rating is performed.

4.1 Introduction

Our model as it stands today is deeply rooted in the theoretical paradigms presented in the theory section. We have chosen to break down IC into the same conceptual framework (*business recipe, intellectual properties, process, management, employees, network, brand, and customers*) as has been done by ICAB for their IC Rating^{TM} tool, this is because we feel that the tool is the most comprehensive model available. It also captures the best parts of the Skandia Navigator, The IAM and the ROC project. Another reason for using the same conceptual framework is that IC Rating^{TM} de facto has reached widespread recognition and acceptance. After all, creating our model is not an issue of inventing the wheel all over again, rather to adjust existing theories and models so that our objectives can be met. The largest challenge for us in the creation of our model was the formulation of parameters that best represent a company's IC. The reader has to bear in mind that the models that have been described in the theoretical background all rely on inside information. Our model, on the other hand, depends solely on publicly available information, making it necessary for us to reformulate some of the available parameters so that they can be applied to this different set of information. One major difference from the IC Rating^{TM} tool is that we haven't separated our parameters into indicators of present *efficiency* of the IC, efforts to *renew and develop* IC, and the *risk* of a decrease in the *efficiency,* as is the case in IC Rating^{TM}. It also needs to be mentioned that we have looked at the 8 areas of focus **in isolation**, meaning that the assessment of a certain area of focus is not depending on the assessment of another. The parameters (these will be laid out in appendix 1) that make up our model have been formulated, hypothesizing about what information best represents a company's IC. In this process the IC

Rating^{TM} parameters have served as a foundation, some have been reformulated and a small number of new ones have been added. It has not solely been the case that we as researchers have intellectualized about what information we want to see but also about what is available. As it turned out all parameters could be filled with information, at least for one of the analyzed companies.

4.2 Information processing

In order to be able to arrive at a reasonably fair rating of our sample companies, a number of different sources have been incorporated in the process. The first step is to gather the information deemed necessary and that has been carried out in the following ways: Information generated outside the companies has, as previously mentioned, been collected through the database Affärsdata. Specifying our sources and time period, searches have been carried out using the actual company name as keyword. The outcome of these searches is a set of articles and telegrams, in terms of numbers ranging from about 40 up to 200 per company. To sort out irrelevant information an initial screening takes place. Articles or telegrams considered irrelevant are those that only bring up issues of financial nature or are repetitions of information that has been previously communicated. The second category of information used is that which has been generated within the companies under investigation. Financial reports as well as press releases have been requested from the sample companies via simple phone calls. Finally, the respective company web sites have been screened for information, and that concludes the process of gathering information. After the information has been gathered and initially screened a more thorough investigation takes place. All the material gathered for a certain company is carefully reviewed and all information that might be considered necessary to assign grades to the parameters is extracted from the raw set of information. After reducing the raw set of information into a more manageable format there is one step remaining and that is to process the information, that is, rate the companies IC.

4.3 Rating

The final rating is made up of intermediary ratings of the eight areas of focus. The ratings of the eight areas of focus on are based on varying numbers of parameters and the grading of these parameters, at last, is dependent on the **accessibility** of information as well as a **benchmarking** aspect. We live in the belief that accessibility, or the lack of accessibility, to information is not enough when rating a company's IC- a comparative aspect is also needed. Say that you know absolutely everything about a certain company but the actual content of that information is that the company is falling behind its competitors, then it would not be fair to assign an overall high rating to that particular company. Below you will find a simple depiction of how a final rating is arrived at.

Figure 5; Breakdown of rating process.

Company rating

Weights are assigned

Focus areas

Parameters

Accessibility   Benchmarking
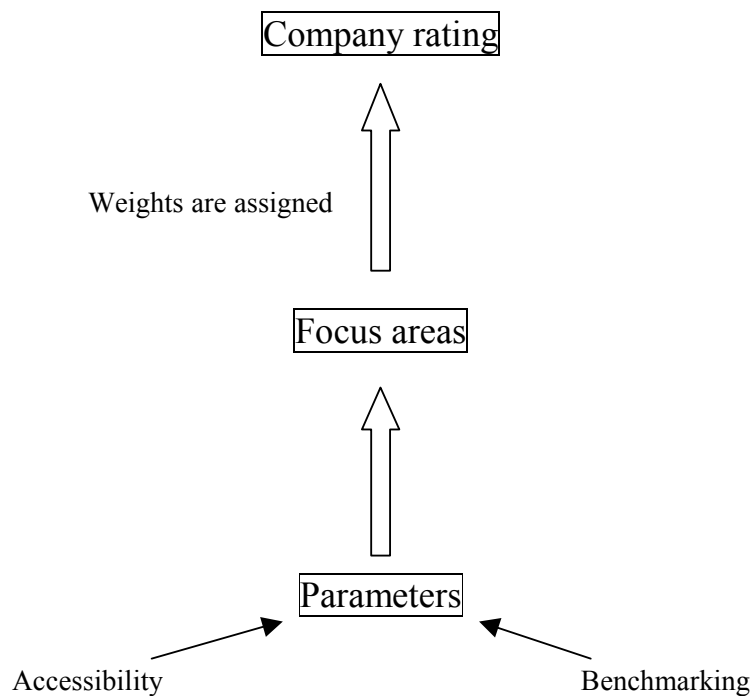
4.4 Weights

- Starting from the bottom, different weights are assigned to accessibility and benchmarking. We have chosen to let accessibility account for 2/3 of the parameter grade and the comparative measure benchmark 1/3. By letting benchmark account for only 1/3 of the parameter grade the subjectivity of the total rating is reduced, this is because the accessibility portion of the grade only establishes facts about the existence or non-existence of information- no subjective values come into play.

- A second weighting may take place before adding the intermediary focus area ratings together. There is some debate concerning what weight to assign to each focus area and there is definitely no consensus, as portrayed in an examination carried out in Aktiespararen (Swedish shareholder periodical), between leading analysts when they are asked to rate the five most important factors when valuing a company. Some have management at the top and business recipe at the bottom, some the other way around and still others have other combinations. The issue of weighting was also brought up in our interviews and while there wasn't consensus among the respondents either, one focus area that was stressed more than the others was management. Whatever weights are assigned to the eight focus areas have to stand on their own because of these disagreements concerning importance.

4.5 Criteria for assessment

The **accessibility** grade, at first, is arrived at using a scale 1 to 5 and the criteria for these grades are:

1. Information about the parameter is not available at all or deemed insufficient.
2. Information is meager and not detailed.
3. The amount/flow of information is satisfactory for an assessment to take place.

4. The amount of information is more than satisfactory but not complete.

5. Information is comprehensive, broad, verified in a number of sources and the appraiser is able to get an all-encompassing picture of the parameter.

When it comes to the **benchmark** grade the companies have been compared to each other and grades, once again between 1 and 5, have been assigned. When comparing the companies, it does not necessarily have to be the case that the best company is given a 5 and the worst a 1. Here our subjective views come into play and it might actually turn out so that the best company only receives a 3 and the worst a 1, or conversely the best a 5 and the worst a 3. In cases where we feel that we have limited knowledge for a just comparison we have been somewhat conservative and assigned grades that are not very dispersed.

4.6 Rating of a company- an example

After collecting all the information that can be found within our predefined set of information channels the assignment of grades on a parameter level is undertaken. Again, two grades are assigned to each parameter, one for **accessibility** and one **benchmark** grade. Each parameter grade is made up of 2/3 of the accessibility grade and 1/3 of the benchmark grade. When grades are handed out to all parameters in a focus area an average is calculated for these parameters. That number, between one and five, is then converted to another scale, between 0 and 100. The conversion that takes place is as follows:

A grade of 1 on the 1-5 scale becomes a 0 on the 1-100 scale, 2=25, 3=50, 4=75, and 5=100. The reasoning behind this conversion is that it is much easier to distinguish between companies, for example in a diagram, when a more detailed scale is in use. After the conversion has taken place there are two steps remaining before a final IC rating is arrived at. First appropriate weights (the sum of these weights must equal 1) are to be assigned to each focus area rating. Multiplying the assigned weight with the focus area rating and thereafter adding these weighted focus area ratings together a final company IC rating is arrived at!

5 Analysis

This chapter will start with a presentation and analysis of the surveyed companies. We will then test the hypothesis using alternative measures of volatility but also further test the developed model by means of widespread financial indicators. Finally we will try to explain why the ratings turned out the way they did.

5.1 Company Analysis

5.1.1 RKS

RKS is an IT consultant firm offering qualified consultant services, integrated business solutions and complete B2B (business-to-business) solutions. The customers are large and medium-sized companies and organisations who, to a large extent, base their competitiveness on an efficient use of information technology. RKS was founded in 1989 and is today represented in 17 locations in Sweden resulting in a close relationship with its customers geographically but at the same time being able to supply customers with the competence of the entire organisation. Aside from the local branches, the company also consists of the nation-wide business areas *e-Business solutions, Education* and *Telecom* and has its main office in Stockholm. RKS is noted on the Stockholm Stock Exchange since 1999 and in that year the company had a turnover of MSEK 207 and a profit before taxes of MSEK 17.3. The annual turnover growth between 1994 and 1999 has been roughly 20 percent per year. Today, the company has 360 employees with an ambition to grow rapidly.

The bulk of RKS's activities are consulting operations spanning from management consultants to programmers and from maintenance engineers to project leaders.

The consulting areas accounted for 90 percent of the company revenues in 1999, while education provided nine percent and software sales was one (1) percent.

Organisation

The organisation is divided into four different competence/service areas:

- **Consulting services;** RKS is Sweden's leading independent supplier of services in Oracle products.
- **Business systems;** RKS is Oracles only Preferred Partner for Oracle E-Business Suite on the Nordic market.
- **Education;** RKS are conducting thorough educational programs through open courses as well as internal company courses.
- **Software sales;** RKS is marketing mainly products from the US based company Quest Software.

Markets

During 1999 RKS customers could be found in telecommunication (21.8%), trade and distribution (18.6%), manufacturing industries (14.6%), public sector (10.9%), pharmaceuticals (13.1%), IT companies (9.6%), finance (8.9%) and others (2.5%). The ten largest customers are; Ikea/Ikano, Ericsson, AstraZeneca, ABB, Telia, Exportkreditnämnden, Tele2, SEB, Cap Gemini and Saab. RKS is partners with Microsoft and Oracle through their respective partnership programs.[35]

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[35] RKS homepage, www.rks.se 2000-11-08.

Figure 6; RKS's different focus areas. Observe the scale on the rating axis.
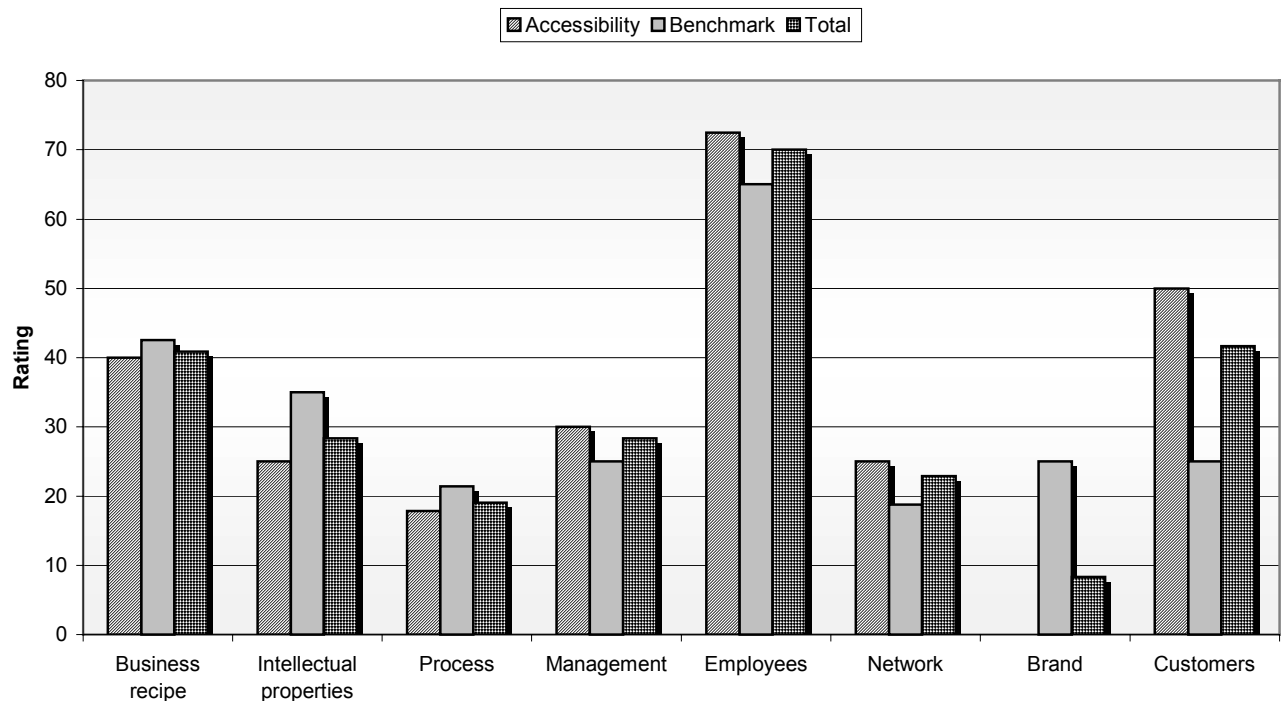
5.1.1.1 Business Recipe

RKS has the most thorough in-depth description of all the companies in our study when it comes to the potential of the business environment. They present their own estimations together with other related organisations' forecasts. Still, the future laid out by RKS differs somewhat from that found in different newspapers for companies like RKS. RKS, who are largely exposed to more traditional IT-services, are expected to encounter a rocky future together with competitors such as WM-Data, Tieto-Enator and Resco[36]. RKS is Sweden largest independent supplier of consulting and educational services in the Oracle domain and one of the largest in Microsoft SQL, this combined with their employees experience in these fields are strong contributing factors to the relatively high overall marks received for the business recipe. Also pitching in are the outstanding grades given to RKS for the information and competitiveness of their organic growth (30 percent giving a rating of 5). Unfortunately for RKS though, the total lack of

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[36] Svensson, 2000.

information for the *Distribution channels* and *Business cycle sensitivity* parameters is dampening the overall rating of the company's business recipe.

5.1.1.2 Intellectual Properties

The exclusiveness that RKS is enjoying concerning a number of software tools has attributed highly to the relatively high rating of RKS in the Intellectual Property area. RKS is a Microsoft Certified Technical Education Center, is the sole educator in the tools from Quest Software and are the proprietor of the GUDA system for Windows. Missing though, is information regarding monetary numbers as well as the duration of the license agreements reducing the overall rating of this area. To conclude, RKS have a competitive edge when compared to its peers due to the company's strong relation with Oracle and the products originating from them and this may prove vital for the organisation, should it remain that way.

5.1.1.3 Process

RKS are showing initiative in the sense that they have established a program taking measures to share knowledge and experiences, both among their employees and their customers. As previously discussed, this is of absolute importance for a consultancy where the assets are the employees and their expertise. RKS have realized this and are eager to inform the observer about it, describing in detail what is done. The lack of these measures (or at least what is being visualised to the auditor) among RKS's peers in this study is appalling and RKS have been rewarded for their initiative. Nevertheless, RKS fails to communicate information on five of the seven other parameters included in our model for the Process capital area, providing RKS with an overall below average score (19 on the zero to 100 scale).

5.1.1.4 Management

In May 2000, Ingemar Söderlind was appointed CEO of RKS. Mr. Söderlind has an MSc and wide experience of the Internet/IT industry from his work in Ericsson and Unisys, both domestically and abroad. Furthermore, he possesses knowledge of public service, the airline industry and banking and finance from prior

engagements in those environments. The remaining management people are briefly touched upon in the annual report and together they are given an average mark on both accessibility as well as when compared to their peers. Unfortunately, what we don't know we can't award. Therefore, it is impossible for us to say anything about the organisation's incentive programs simply because RKS fail to reveal any information concerning this parameter.

5.1.1.5 Employees

RKS seems to have made a point of only hiring the best available people, striving to hire as many women as men, keeping focus on more experienced people as well as bringing in new recruits, keeping these people in the organization, rewarding and motivating them, getting the most out of them and updating their skills while at the same time informing the people following the company from outside of this. It is remarkable and should serve as an example for other companies, the way RKS makes its most important asset visible and competitive. The company receives top marks on five of the ten parameters and an overall score of 72.5 for accessibility. They are further given above average ratings in seven parameters when benchmarked with their peers arriving at a total of 65 in the category. All in all, this is the single area giving the highest overall score among all the companies in the survey.

5.1.1.6 Network

RKS has a strong relationship with Oracle and Microsoft as described earlier, two very competent partners with big potential and holding a large chunk of their respective business areas. In addition to this, RKS is a member of the DSDM consortium that gives the company hopes to increase efficiency per consulting hour. Also, the company has been chosen as partner of the Karlskrona/Ronneby University in a project aimed at helping small and medium companies to increase their competitiveness by supporting them in the process of applying e-business. Bringing the overall area rating down though is the lack of information regarding what these partnerships and co-operations provide RKS with and to what extent

RKS are taking advantage of the opportunities arising from them. The result is a final score well below average.

5.1.1.7 Brand

As with most other companies in this study it is very hard for us to establish the strength and reputation of the brand name and what it accommodates RKS with. It may very well be that the name RKS holds a strong position among it's peers but judging from the material that we have gathered using the search criteria which we have specified, we simply cannot say. All we can say is that out of the seven companies concluded in this study, RKS was the company arriving at the least found amount of material. However, based on our lack of expertise of the IT/Internet industry, we do not give RKS the lowest possible mark but one that is still below average (2) due to issues raised above.

5.1.1.8 Customers

RKS gives the observer a glance of the potential of their customer base when they announce the growing engagement that they have with IKANO Finans, IKEA's financial unit and that this is the continuance of a 15 year long commitment with the company. As a whole, RKS are relatively good at communicating their new-struck deals and this brings the total mark on accessibility up to an average level. The company also informs us of how big a portion of their sales can be attributed to its five and ten largest customers. The share is 49 and 63 percent, respectively, a rather high figure when compared to its peers and this is of course reflected in the score reducing it just below average.

5.1.2 Prevas

Prevas AB is active within the IT-consulting industry through its four business areas Life Science, media.com, e-security and Industrial IT-solutions. The company can be found in eight different locations in Sweden (Västerås, Göteborg, Karlstad, Linköping, Malmö, Skövde, Stockholm and Uppsala). In November last year (1999), Jonas Wiström took over as CEO from Göran Lundin, the founder

and now chairman in the company. The company has approximately 320 employees, a turnover of 232.7 MSEK in 1999 and made a profit of 13.4 MSEK in the same year.

- **Prevas Bioinformatics** (Life Science) is active in the business area biotechnics, pharmaceuticals and medical science and offers its clients business development and software development. Among its customers are Amersham Pharmacia Biotech, AstraZeneca and Pharmacia Corporation.
- **Prevas e-security** offers solutions in safe e-trade and long term storage. Customers are ABB, Volvo Group, Vattenfall and Sign On among others.
- **Prevas Industrial IT** supplies solutions in embedded systems as well as IT-solutions for product control. Ericsson and ABB are amongst the customers.
- **Prevas media.com** focuses on Internet solutions for mobile telecom and Internet distributed broadcasting. Customers are Ericsson and the Swedish public service TV (SVT).

As opposed to many other IT-companies, Prevas offers a high share of fixed rate projects, a fact that is expected to be an advantage for the company in the future.[37]

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[37] www.prevas.se, 2000-11-13.

Figure 7; Prevas different focus areas. Observe the scale on the rating axis.
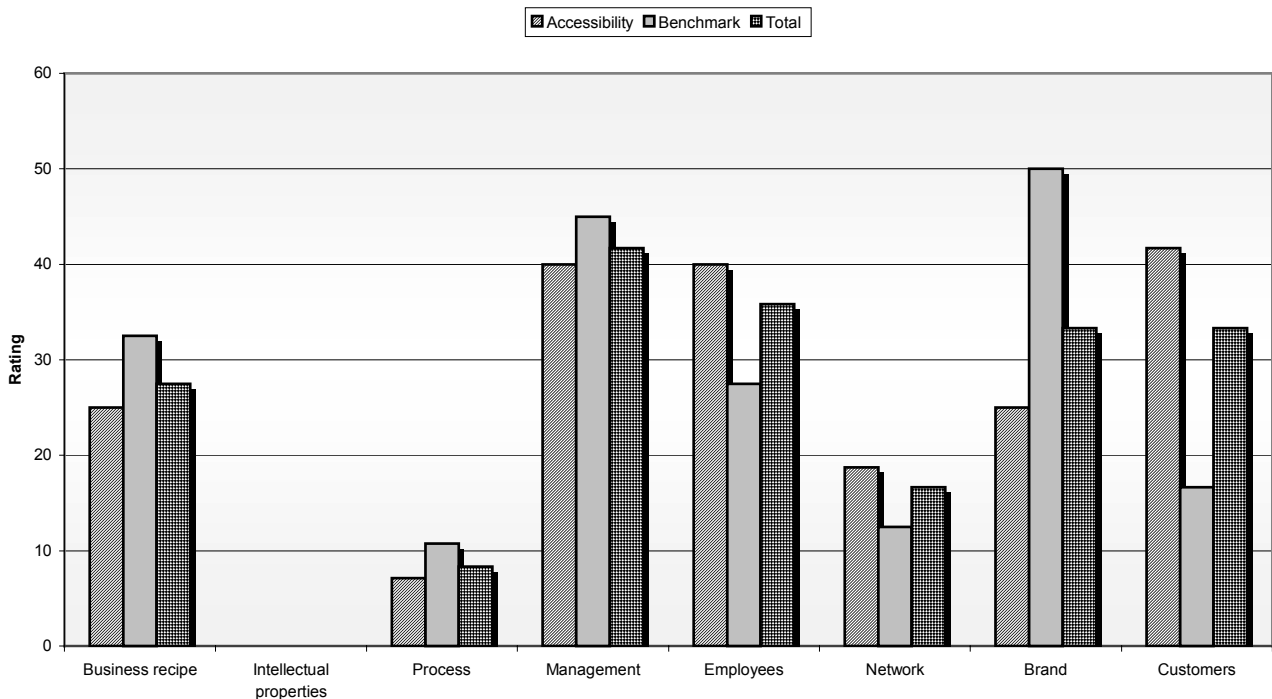
5.1.2.1 Business Recipe

During the past year Prevas has directed their business recipe towards Internet/IT. They have done so by selling off the production automation unit, Prevas Engineering AB, to ABB. The future potential for Prevas has been given an average rating (3), we base this rating on a forecast[38] predicting growth for highly specialized telecommunication related consultants. One of Prevas selected areas of expertise is e-security and the company are aiming at becoming a top five competitor in this area as well as they are with the media.com unit. Regarding the Industrial IT business, the future growth is reliant on the access to qualified personnel. Overall, Prevas forecast is to reach a turnover of MSEK 230 this year, MSEK 310 next year, MSEK 430 in the year 2002, in 2003 a turnover of MSEK 600 is projected and, finally, in 2004 Prevas are aiming at a turnover of MSEK 1060. Furthermore, Prevas seem to have an edge on their competition in the fact that they are given 91 percent of the projects they are bidding for as well as the

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[38] Svensson, 2000.

organic growth figures of 25 percent in the latest report. On the downside though, is the lack of information provided for the parameters *R&D investments, access to suppliers and distributors, business cycle sensitivity* and *access to capital*. This brings the final rating of Prevas business recipe down.

5.1.2.2 Intellectual Property

Not much to be said actually. There is no information on licensing agreements or patents, whether or not there are any. For reasons that need not be explained, the rating in this area is the lowest available and obviously, this area will bring down the overall rating of Prevas.

5.1.2.3 Process

As with Intellectual Property, no information is publicized for all but one of our developed parameters. And, just as in Know IT's case, the parameter that we have information for is that of *operating costs per employee.* Prevas operating cost spread on all employee's is SEK 822 310, giving them a rating above average, 4. In conclusion though, Prevas are given a low overall rating in this area, 1.33 on a scale from 1 to 5 translating to 8.33 on the scale ranging from zero to 100.

5.1.2.4 Management

At the end of last year, Jonas Wiström was appointed as CEO of Prevas. He replaced the founder Göran Lundin who, up until then, had been the CEO since the start of Prevas in 1984. Mr. Lundin remains within the company as chairman of the board of directors. Mr. Lundin is still an important figure in the company and just prior to his resignation as CEO, he was given the award "Entrepreneur of the Year" in Sweden 1999. The board of directors is thoroughly introduced in the first interim report of this year and the experience of the people on the board are very broad and are therefore rewarded. People in leading positions though, are not further introduced and this insufficiency clouds the parameter somewhat, bringing the accessibility grade down to a 3 and arriving at 3.33 overall for the management experience parameter. The only major setback in the management area is the lack of information concerning option programs and other incentives

for the management staff, an area of increasing interest in the media and one that has been surrounded by controversy.

5.1.2.5 Employees

Just looking at the grades given to Prevas on the accessibility, it is pretty obvious that when Prevas do inform us of their staff, they do it well and the numbers are relatively good. However, out of the ten parameters that we have looked at, Prevas fails to communicate five of them to the observer. The five parameters are *Gender, Trainee opportunities, Share of revenue generating employees, Time of employment* and *Competence development*. Turning so to the parameters for which Prevas do provide information, it is clear that Prevas work force is well educated and tend to stay in the company. 76 percent of Prevas employees have a college or university education and the employee turnover was 7.6 percent in 1999. The age structure in the company is also very well portrayed in a graph showing that a large portion of the employees are between the ages 25 and 35 and yet a reasonable amount of people above 35 as well as below 25.

5.1.2.6 Network

Network is a poorly developed area in regards to how well it is portrayed in published material. Prevas mentions deals negotiated with Object Time Ltd., Arexis AB, Loyds Register and a few others but the time span, stability, the implications and so on is not further revealed. With one exception. Prevas are co-operating with Sign On, Sign On is one of few companies who fulfill the European Union's terms of reference regarding electronic signatures status as legally binding. The Swedish government have made a proposition that they should be from next year and should this be the case, Prevas may be in a profitable position.

5.1.2.7 Brand

Positive for the Prevas trademark is the previously mentioned award given to the former CEO Göran Lundin as "Entrepreneur of the Year". Besides that, we can only judge Prevas from the amount of hits when we applied our search criteria as

formerly discussed. 46 articles was the result of our search, a rather meager result and one that reduces the positive effects of the award on the overall brand name rating resulting in a grade of 2.33 on a scale from 1 to 5 and 33.33 on the zero to 100 scale.

5.1.2.8 Customers

Prevas is given an average rating in regards of the accessibility to information concerning the parameters duration and stability, and the reliance on major clients. However, Prevas are relatively dependent on their five largest clients who account for 45 percent of sales and although Prevas has a large client base, the high dependency on these five customers may prove risky and attempts to reduce their share should be considered. Moreover, Prevas fails to inform us of the possibilities of their customers, the market share, the growth potential and so on are factors of interest but they are all left out. This induced us to give Prevas a mark just below average in the *Customer potential*-parameter, hence a 2. Overall, Prevas scores 33.33 points on the zero to 100 scale.

5.1.3 Know IT

Know IT AB was founded in 1990, it then had two employees, today it has approximately 600. The company is noted on the SSE, Attract 40. Know IT is a consulting firm with a number of subsidiaries in Finland and Sweden and is divided into five business areas; ERM, Norr, Stockholm, Sydväst and Växthuset. The company focuses on "edge technology for the digital business market" and with technical edge competence, the company offers its customers competitive power. Know IT's customers can be found in a wide range of business areas and among them are Ericsson, Telia, SEB, Trygg Hansa, Sveriges Riksdag, SCA and RFV. Among Know IT's partners are Jeeves, Axapta and Microsoft. In the last annual report (99/00), Know IT had a turnover of MSEK 547.7 and made a loss of

MSEK 15.2. The loss can according to Know IT be referred to the large restructuring that had been done over the last year or so[39].

Figure 8; Know IT's different focus areas. Observe the scale on the rating axis.
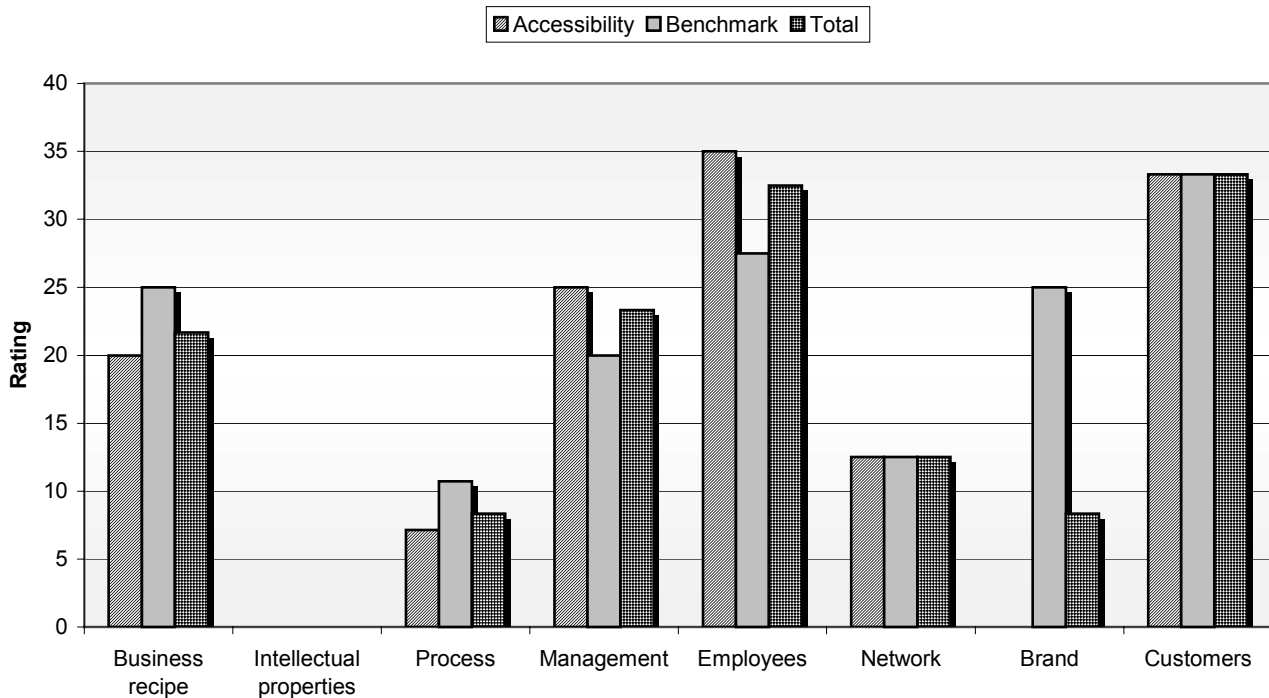
5.1.3.1 Business recipe

Know IT's business recipe is briefly described above, however, the company does a poor job of communicating what they actually do to the observer of their Internet home page or any of the financial reports surveyed in this study. To someone who is not an expert in the IT-/Internet consulting field, it may be a puzzle what they're all doing? It should not be to hard for companies to, in a clear-cut and easy understandable way, present what they are doing. Of the parameters that we have looked at for this study regarding Know IT's business recipe, it is easy to see just looking at the amount of material published that Know IT aren't doing a good job visualizing their intangible assets. Regarding accessibility, Know IT receives the

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[39] www.knowit.se

lowest grade (1) on six out of ten parameters and only one parameter receives the highest grade, organic growth. Organic growth is also the parameter collecting the highest overall rating with an average of five. This is due to the high percentage of organic growth compared to the other companies in the survey. With as high a share as 50.5 percent of the increase in turnover of MSEK 88.4 in 1999, Know IT shows that acquisitions aren't the only way to go. Of the other parameters only R&D-investments have been given a medium rating with an average of three. Know IT receives the lowest possible rating (average one) on the parameters *Differentiation, Competition, Distribution channels, Business cycle sensitivity* and *Access to venture capital.* These, seemingly very harsh, ratings are mainly due to the lack of information in the material reviewed and may be somewhat misleading but how should a potential investor find information if not by turning to the company itself, and relevant material written about it and read their views on the future of the company, business area, the competition and so forth? A more thorough presentation and visualization of the aspects mentioned above will most likely alter our rating of this area but for the moment no such information is available and hence the company must be given a low rating regarding its business recipe.

5.1.3.2 Intellectual Properties

Most striking about this area is the lack of information that can be found in most of the companies in our study and is something which is very puzzling to us. Obviously, the difference between the seven companies dependency on license agreements and patents is substantial but they are all in some way reliant on these factors. Even if they were not, a note simply saying that they aren't would probably satisfy an auditor in this area. Needless to say, Know IT does not inform us in any way about their license situation, whether there are any substitutes, time perspective etc.. All in all, Know IT are given an average of one throughout this area.

5.1.3.3 Process

As with Intellectual Properties, Process capital is a part of the Organizational capital of a company and just as with Intellectual Property capital, Know IT does a poor job presenting their Process capital. However, as opposed to the previous area, one parameter can be found through some simple mathematics. The operating expenses per employee is the only parameter given another grade than one, it is given an average of 3.33 with a 3 for accessibility and a 4 when compared to the other companies in the study. Most appalling though, is the lack of information given to an observer regarding Know IT's systems for knowledge and experience sharing. As previously discussed, a consultancy is highly dependent on their personnel and the knowledge and experiences they possess. Sharing and preserving this information within the company and making sure it is spread to new employees and, thereby, decreasing the dependency towards single individuals is of the utmost importance. Withholding this information shows a lack of feeling for the importance of this factor. We have little doubt that Know IT actually have these systems but that the company chooses not to inform us of them, we feel, is a serious drawback and results in the lowest grade, 1. Overall, Know IT is given a very low rating on their organizational capital and this will obviously reduce the overall rating of the company in a significant way.

5.1.3.4 Management

The past year has been a turbulent one for Know IT's management and employees. During spring, a number of people in management positions resigned due to controversies with the previous CEO, Carl-Emil Sundberg, and there were a lot of rumors concerning the reasons for their resignations. It has been estimated that the company lost MSEK 264 in market value due to the turmoil. The fact that Know IT doesn't hide this (they informed the market of the circumstances, from their point of view, in a press release[40]) together with the amount of attention that it got, does provide us with a lot of information hence increasing the accessibility and the grade given. For obvious reasons, the rating when compared to other companies is somewhat lower giving the parameter a grade of 3. In the present

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[40] Press Release, 991028, www.knowit.se.

board of directors, however, Know IT seems to have put together an interesting combination of people. Among them are former Minister of Finance in Sweden Erik Åsbrink, and Johan Roos who has written a book dealing with intellectual capital. In addition to this, the present company CEO is a woman (Ingrid Engström), the only one among our sample of companies, and for this the company has been rewarded. In conclusion though, the company receives a rather low rating due to their lack of information regarding options programs and other incentives for management and the turmoil of last year and the uncertainty this brings.

5.1.3.5 Employees

As can be expected for a consultancy, Know IT receives reasonably high marks on the presentation of their employees. They have an average amount of female staff-members and the level of education among employees is top-notch compared to the surveyed companies, as many as 94 percent of the consultants has a MSc degree and 80 percent of co-workers has some form of college or university degree. Furthermore, the amount spent on increasing the competence level amongst the workforce is average when put against their peers; the company spent MSEK 5.8, which is approximately 20 percent of the profit, in 1999. This can be compared to RKS that spends an amount similar to their profit each year. On the downside, Know IT omits information regarding the age structure, trainee possibilities, and the share of employees generating income and how long the work force on average has been working for the company. These are all important parameters and should be in the interest of the company to present and, what's more, they are very easily derived when access to company information is given.

5.1.3.6 Network

Although the information regarding Know IT's partners is scarce, the company reveals which companies are their partners and in some cases the potential of these allies. Companies that are mentioned on Know IT's home page as partners are Jeeves, Axapta, Microsoft, Lotus, SAS Institute, Snow, Oracle and Centura. In addition to this, supplier partnerships have been signed with other companies.

However, it isn't further developed as to what extent the partnerships are being used or what the partnerships provide the company with or what measures are being taken to develop new partnerships. Nevertheless, some of the above mentioned partners can be regarded as stable and strong partners and are therefore given an average rating. Unfortunately though, the total impression of the Network area is overshadowed by the shortcomings raised here and in conclusion, the rating is below average.

5.1.3.7 Brand

When using the search criteria as previously discussed, the amount of articles and telegrams found on Know IT was 75. This is an average amount, however, the bad publicity that the company received when a number of management personnel and employees left the company has forced us to reduce the rating from 3 to 2. Our interpretation then, is that all publicity isn't good publicity and that the turmoil hurt the company's brand name. It is quite possible that the name Know IT is more known because of the commotion but the strength and perception of the company is with all certainty damaged.

5.1.3.8 Customers

Just looking at the total ratings of Know IT's different IC areas, the customer area is the area receiving the highest grade (it is rated somewhat higher than employees). Not much information is published about the extent and stability of the client relationship that Know IT has with its clients. But then the five biggest clients were responsible for 28 percent of the company turnover in 1999, a relatively low share when compared to its peers in our study. The five largest customers are Ericsson, RFV, SCA, Telia and Trygg-Hansa and some of Know IT's other customers are SEB, SVT, the Swedish Parliament (Riksdagen), Europolitan and Pharmacia Upjohn. It would be desirable though, to learn more about Know IT's clients, information regarding market share and potential which is not submitted by the company and that is a drawback limiting Know IT to a rating of 33 on a scale from zero to 100. Although this is the highest mark scored by Know IT, it isn't a particularly good one!

5.1.4 Softronic

Softronic offers company adjusted IT-solutions, services in management and strategy advisement, and substantial projects in which Softronic takes full responsibility for service and maintenance. The company's activities are mainly performed in Sweden but the company has activities in Estonia, England, the USA and Denmark. All in all, the organization consists of 18 companies though some are resting. In 1999, the company had a turnover of MSEK 311, and the profit before taxes was MSEK 49.2. 90 percent of turnover can be referred to sales of consulting services and licenses. Anders Eriksson who since then has been CEO founded Softronic in 1984. Today, the company employs approximately 360 people out of whom 326 are consultants and 67 are women. In December 1998, Softronic was introduced on the SSE and since then two acquisitions have been made (Consultus in September –99 and Bellatrix in November the same year). Although Softronic first and foremost is an IT-consultant, it has developed a web-based software tool for insurance companies. The product itself provides Softronic with license revenues as well as its clients with assignments. Softronic aims at medium sized and large companies and its competence is independent of what market the client is in. In 1999 41 percent of the customers were in the Insurance and Finance industry, 22 percent were in active in Trade and Service related industries, 17 percent came from public companies and 13 percent were Telecommunication firms. Among its customers Softronic can count Universal Air Express, Telgebostäder, NetInsight, Ph&U, CityMail, Skandiabanken, Landstingsförbundet, Svenska Byggnadsarbetareförbundet, Stora Enso och Luftfartsverket and KPA.

Figure 9; Softronic's different focus areas. Observe the scale on the rating axis.
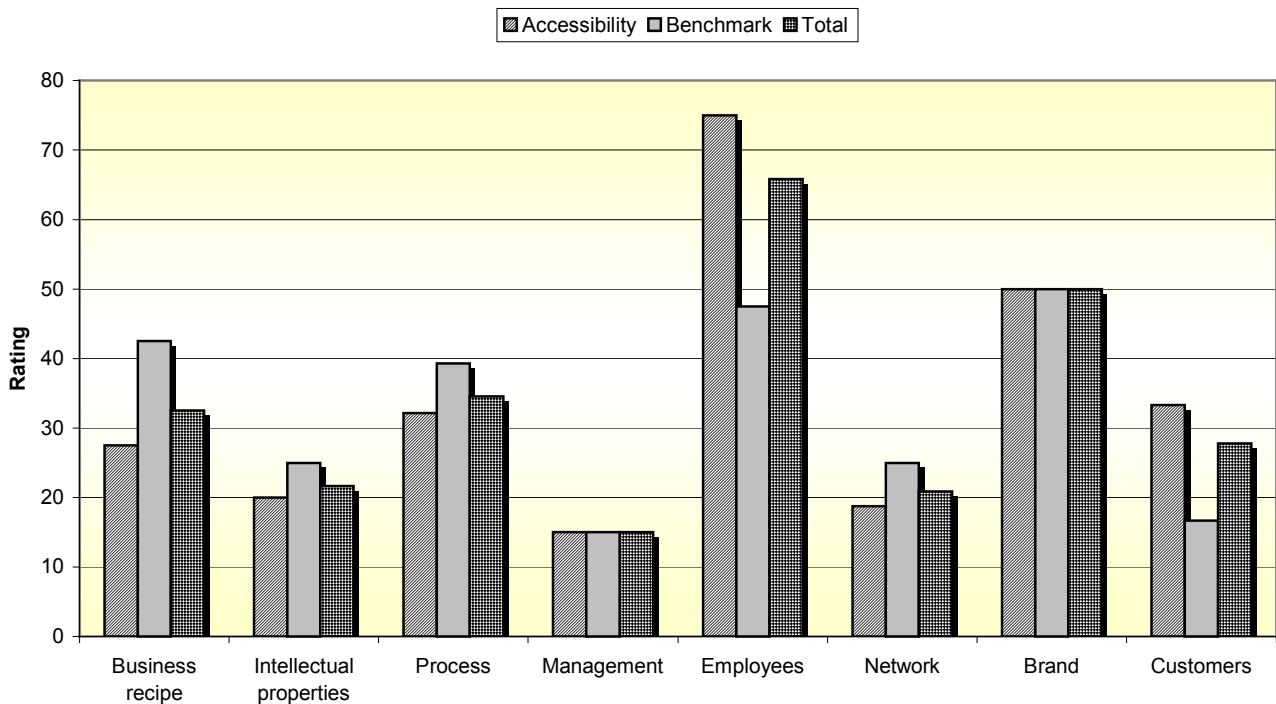
5.1.4.1 Business Recipe

In the reviewed material, Softronic are optimistic about the future and so are we, among others. Öhman Fondkommision forecasted an average profit growth of 60 percent over the next three years[41] and Softronic have successfully niched themselves with ITM, a software product aimed at the insurance industry. ITM has so far been very successful, and the product recently made a breakthrough i the US where a deal was made, via Softronics US-based partner Scruggs Group, with Armed Forces Insurance which is the company providing insurance's to all armed forces employee's. Furthermore, Softronic are well set with its supply channels through partnership deals with IBM in Sweden and Denmark and with the British company Rebus with activities in 40 different countries. On the downside for Softronic is the meager information on the company's competition.

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[41] Finanstidningen, 1999.

5.1.4.2 Intellectual Properties

Softronics advantageous position with the previously introduced ITM-license carries this category for the company. The company has high hopes for the product, still it may be hazardous for Softronic to become to dependent on ITM. At the moment though, it's only a small part of the company's total sales. Considering how highly regarded the company holds the ITM-license, it is mind-boggling that they don't further inform the observer of its competition, life span or any threats arising from these issues. But then again, why would the company want to raise any doubt to a potential investor or creditor? The sales of ITM between the years 1997 and 1999 were MSEK 3.7, MSEK 6.1 and MSEK 8.7 respectively showing a steady growth.

5.1.4.3 Process

Contrary to many of its peers, Softronic have come a long way visualizing its Process capital. It still, however, has a long way to go lacking information for three of our parameters. Still, the company submits the share of its working staff generating revenues as consultants as opposed to supporting staff. Furthermore, Softronic positioned itself well in a survey addressing the work climate in the IT/Internet industry. Softronics employees were on average more positive towards their employer and the work environment than its peers. Softronic attributes Consultus, an acquired management consultancy, its success when it comes to visualizing its hidden assets. Consultus are using the FBR (den fullständiga balansräkningen – the complete balancesheet) for this and the company has also developed the CSE (Client Server Environment). CSE is a tool consisting of re-usable components for methodologies, analysis and design combined with process-oriented workflow technics making it possible for employees to keep updated whereever they may be. Softprocess is a similar system designed to accommodate the staff when applying new processes.

5.1.4.4 Management

Softronics management staff are not very well communicated to the public and the little that is portrayed gives us the impression that the board of Directors is a very

homogenous group consisting of only one woman and 14 men. However, recently changes have been made and Marianne Arosenius has been proposed as the new CEO and should that happen, a revising of the situation will be necessary. Left out also, are the parameters incentive programs, leadership index and management turnover bringing down the overall rating of this area to well below average.

5.1.4.5 Employees

With the aid of Consultus and the FBR, Softronic does a very good job visualizing their employees. In the recent annual report the observer is provided with basic statistics regarding this area. We can easily find figures for number of employees, the share of employees generating revenue, turnover per employee, average age, share of female employees, education etc. The only parameters where we feel disappointed are *incentive programs* for the employees and *competence development* where Softronic are given a rating below average on accessibility. On the upside, accessibility-wise speaking, are the *gender*, *employee turnover*, *EVA per employee* and *time of employment* parameters. Overall, Softronic scores a 4 on accessibility but a somewhat lower mark for the benchmarking aspect with 2.9, just below average. Bringing this category down are the parameters *incentive programs, trainee possibilities* and the *low amount of females* working for the company, 18 percent. Adding accessibility and benchmark together, Softronic receives the mark 3.6 which is well above average and proves to us that Softronic have realized the importance of the people working for the company.

5.1.4.6 Network

Once again, Softronics close co-operation and access to Oracle's product puts them in a healthy position. This partnership is a big reason for the above average marks scored for the parameter *partners* when Softronic is compared to its peers, the accessibility is given an average rating making this parameter the strongest one in the network area. As with most of the other companies in our study, Softronics overall score for the Network category is brought down by the lack of information concerning what opportunities arise from the partnerships and to what extent the company explores these opportunities. On the final parameter, Softronic is given a

total rating of 2, the reason for this is that Softronic has engaged in a campaign attempting to raise the awareness of the company externally as well as improving the corporate culture internally.

5.1.4.7 Brand

Softronic's brand name has over the course of the observed time period received a real shot in the arm in form of being noticed as one of Europe's top 500 companies in creating new business opportunities. Among these 500 companies 22 were Swedish and Softronic took 16th place when compared to them. Softronic also has, according to their CEO, been able to be more visible and communicate their message in a more effective way.

5.1.4.8 Customers

When it comes to customers Softronic seems to be a little bit too reliant on a few large ones. The five largest customers accounted for 42% of total sales, leaving Softronic in a rather vulnerable position. It would just take that a couple of customers took their business somewhere else, then Softronic would be in deep trouble. The risk inherent in being dependent on just a few large customers has also been reflected in the valuation of Softronic's stock price, that has not been up to par. The inability to visualize customer relations in a more detailed fashion has rendered Softronic a non-satisfactory score of 27 for this class.

5.1.5 IMS

IMS was founded in Stockholm in 1985 and was back then focusing on developing and selling hardware and software. The hardware business has over time been phased out and the last step in this process was undertaken last year when IMS signed a deal with U.S. firm Ingram Micro that now handle all aspects of the hardware business. IMS of today is more of a service provider and is organized into four different but deeply codependent enterprises:

- IMS Internet Consulting helps their customers in developing business processes with a clear focus on Internet based B2B.
- IMS ASP Center deals with everything from day to day maintenance of web servers, mail and business systems, web hotels, to helpdesk and support.
- Edison IMS provides the strategic competence within communications and graphic design needed in order for brand building on the Internet to be aligned with a company's overall perceived profile.
- IMS Computer Products combines sales, via their own e-business solution IMS-e, with qualified local retailing.

IMS has since the launch in 1985 grown steadily and the company is nowadays present in 16 different cities from Skellefteå in north to Malmö in south. The number of employees was at the peak close to 700 but after the Ingram deal massive layoffs have been undertaken so that around 475 people work for IMS at present. Earnings figures have been somewhat volatile over the last five years, positive figures in 1995 and 1996 were replaced by losses in 1997 and 1998 just to rebound back to a profit of MSEK 9.6 in 1999. The first nine months of 2000 have not surprisingly been sluggish as has been the case for most IT-consultants and 70% of the value at the start of the year has been cut out of the IMS share.

Figure 10; IMS different focus areas. Observe the scale on the rating axis.
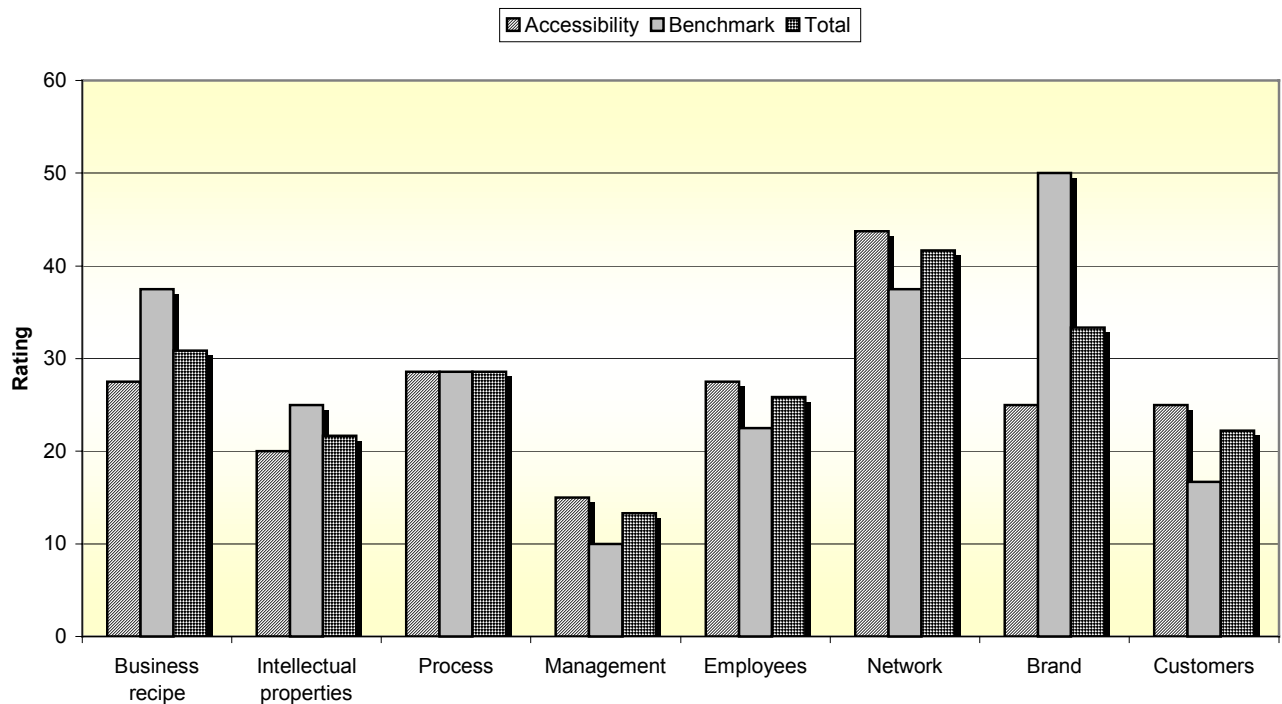
5.1.5.1 Business recipe

Somewhat surprisingly IMS got a rather low grade on business recipe. The business recipe is after all the foundation upon which all other activities are based so one would expect this to be a highly prioritized area but our analysis shows that that is not the case. IMS' potential to succeed over the next couple of years has been deemed rather good, mainly because of one specific settlement with an American firm, Ingram Micro. This deal has been communicated intensely resulting in a high grade on accessibility as well as benchmarking. One benefit of the Ingram Micro deal is the fact that IMS gets access to hardware distribution channels in the U.S. via Apple, Compaq, HP and IBM- all partners of Ingram. IMS also has acquired exclusive distribution channels in Norway via IT Innovation AS. All in all IMS seems to have strong distribution channels and they are also comparatively well communicated, therefore leading to high grades on accessibility and benchmarking. On the negative side we have to mention

concentration on R&D, business activity sensitivity, and level of competition-these are all omitted, dragging the overall grade down.

5.1.5.2 Intellectual Properties

The average grade on immaterial rights for all the companies in the sample was low and IMS is no exclusion, they were however not worst. Whether there are any substitutes to IMS' immaterial rights or not and how large a share of the market these immaterial rights have is totally unknown but the dependency/exclusivity, revenues generated, and the time perspective of these rights are fairly well communicated.

5.1.5.3 Process

IMS's score on process is compared to the other companies in the sample right in the middle. What stands out is the fact that there is no indication whatsoever about if there are any actions taken to conceptualize working methods. The importance of doing so has been stressed before and we are certain that IMS has taken steps to do so but an external investor needs to know about these actions and this is an area for improvement for IMS. Another negative fact for IMS is that operating expenses per employee are really high on a comparative basis. We will not go as far as saying that these high operating expenses are caused by the lack of conceptualization of working methods but it might be an indication in that direction.

5.1.5.4 Management

Management proved to be the area where IMS scored the worst. Nothing much can be said other than that it is surprising to see that the communication about it is so obviously neglected from IMS's side. The importance of management for the future success for any company has been emphasized (see analysis of MSC) and even without going into the degree of importance, one would expect to find more information about upper management and the board of directors.

5.1.5.5 Employees

All IT-companies stress that their most important resource is its employees, and so does IMS. The overall transparency is however rather low. As many as four parameters could not be filled at all and that is quite alarming having in mind that it does not require much effort to submit some of the most basic details about level of education, demographic structure etc. IMS does emphasize the actions taken in order to develop the competency of their personnel, for example through their newly introduced IMS Business School where advanced training is offered to employees in order to safeguard a high customer satisfaction. Other than that the accessible information is sparse and also scores low on our comparative scale.

5.1.5.6 Network

Network is the area where IMS received its highest score, and by a large margin that is. This is not a field that is easily communicated but both primary and secondary sources have revealed important information, rendering a satisfying overall grade. The details of IMS's partners such as Microsoft and Ingram Micro as well as what these partnerships will mean for IMS in terms of publicity and access to new competencies have been thoroughly communicated and scores for these parameters have accordingly been set high. IMS's attempts to strengthen current networks and develop new ones are however not very visible to an outsider.

5.1.5.7 Brand

Assigning a fair grade to IMS's brand, and at the same time remaining objective, is quite hard to do. The brand building efforts are not highly visible but one mark of distinction- "Best business plan of the year" offered by the magazine IT-branschen- certainly boosted IMS's brand name.

5.1.5.8 Customers

The customer area, at last, is once again an area for improvement for IMS. The dependency situation is not mentioned at all. Saying that some customer relations span over a 15 year time period does not say that much, some quantifiable

measures are needed here. Pharmacia & Upjohn is the largest customer and this deal is renegotiated on a regular basis but the details of this deal as well as all other customer relations are left out, making it extremely hard for an outside observer to arrive at an opinion about IMS's relation to, and dependency on its largest customers. In the end this increases uncertainty and ultimately the risk perceived.

5.1.6 MSC

MSC is a rather small consultancy firm and, according to themselves, a downright IT-partner working within the rapidly growing market of e-business. Their primary areas of competency are the Internet and mobile Internet, system integration, network and communication, and educational services. MSC is one of the forerunners and initiators of the WAP (Wireless Application Protocol) technique and it is also within this area that MSC seems to have the greatest potential of growth and prosperity.

Areas of competency
- Business Solutions- MSC's business area focusing on business development, business operations and project operations.
- Mobile Solutions- Focusing on creating mobile applications and practices. An important component in this competency area is the creation of WAP services.
- Object Solutions- Within Object Solutions there are three categories of consultants: developers, methodology consultants and project leaders. Their competencies are based on two fundamentals that are shared by all members of the group, namely object oriented development and Rational Unified Process (RUP)
- Standard Platforms- The consultants are working with their customers' business critical systems that oftenly fall within combined technical platforms.

- Network Solutions- Offers qualified services for network and communication.
- Training- Offers courses aimed at both administrative and technical users of PC's.

Characteristic for all areas of competency is that MSC is working closely with their customers throughout the whole process from the idea stage until the service is implemented.

MSC's major customers come from four different industries: Banking & Finance, telecom, travel and shipment, and insurance. Long lasting relationships have been developed with companies such as Ericsson, Postgirot, Statens Järnvägar, Skandia and Vattenfall. MSC's organizational structure is because of the size factor relatively flat. The number of employees is currently (fall 2000) around 130 and the vast majority, around 80%, are what we call revenue-generating personnel. Worth noticing is that the CEO, Muazzam Choudhury, holds almost 80% of the voting rights in the company.

Facts
- The MSC share was first noted on SSE in may 1998
- Net sales are currently around MSEK 115 per year
- Net sales have grown at a rate of approximately 30% per year during the years 1995-1999 but have declined remarkably over the last year.

Figure 11; MSC's different focus areas. Observe the scale on the rating axis.
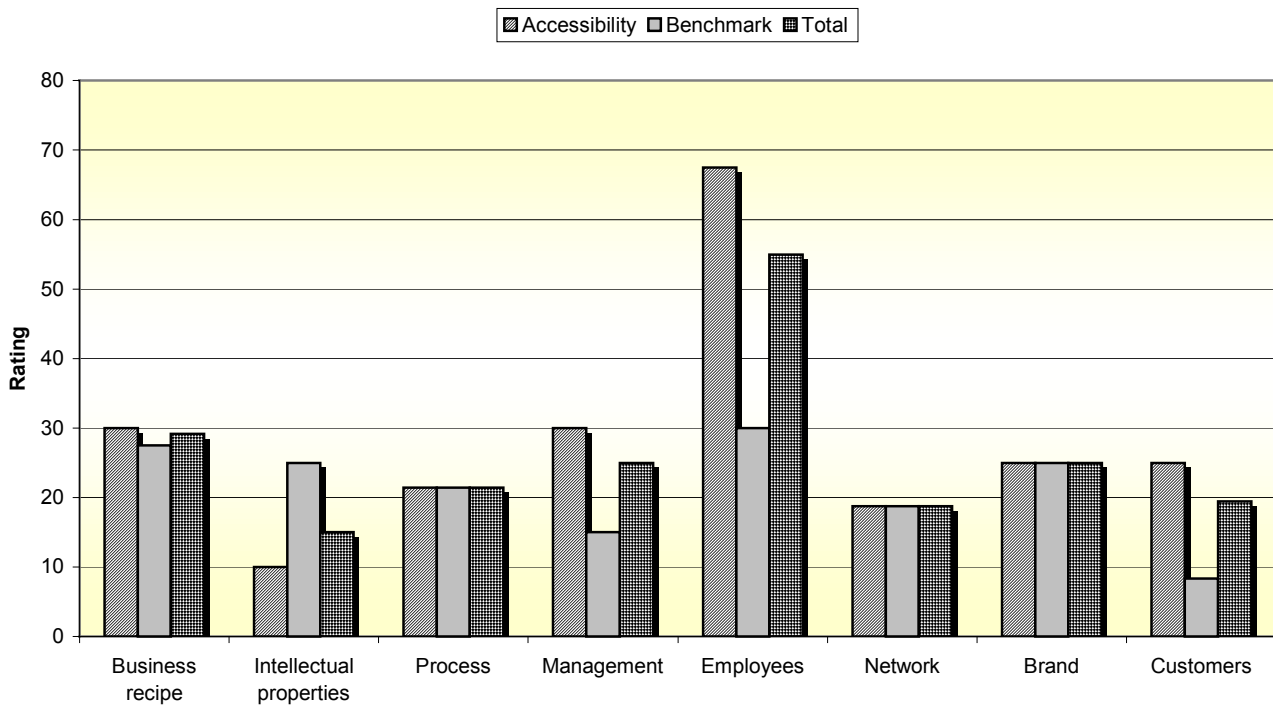
5.1.6.1 Business recipe

MSC does a rather poor job in communicating the details of their business recipe that we are interested in analyzing. Most of the parameters are just briefly touched upon or completely omitted. One aspect, or indicator, of the business recipe that seems to be extremely important to communicate externally is the business potential that depends upon chosen strategy. Compared to the rest of the companies in the sample MSC receives an average grade on business potential but the available material is surprisingly scarce. For a company of MSC's size it is of utmost importance to increase the flow, and the quality, of the information released. External investors are definitely interested in learning as much as possible about the potential the company has within its business environment and not communicating this potential thoroughly might prove fatal. The one aspect that is easiest to communicate since it is more clear cut than the others is organic growth and that is also the only parameter where MSC receives the highest grade on accessibility. Comparatively, however, the organic growth has been deemed to

be on the low side. The size factor (MSC is very small when compared to for example WM-Data) seems to have an impact on the amount of written material originating outside the company. The size of the company also certainly negatively affects MSC's ability to attract new employees on an overheated labor market and find new sources to fund future expansions. Overall MSC scores rather low on business recipe with no significant differences between the accessibility of information and the benchmarking aspect.

5.1.6.2 Intellectual Properties

As has proven to be the case for most companies, immaterial rights is the one area that carries the worst transparency for MSC. Immaterial rights de facto have an impact on MSC's overall result but the dependency on these rights, the longevity of them and the revenues they generate are extremely vaguely communicated, both from MSC's side and all other sources screened. Accessibility wise MSC scores very low on immaterial rights and comparatively better on benchmarking.

5.1.6.3 Process

The internal structure of the companies seems to be one of the areas where most companies struggle to communicate and MSC is no exclusion from the rule. Three out of seven parameters could not be filled with any material at all and the rest showed rather low scores, maybe except for operating costs per employee where MSC scored on the high end. Formalizing working methods into standardized guidelines and concepts is a very effective means to increase efficiency (it also reduces the overall risk of the company since dependency on individuals is reduced) and MSC might very well be good at doing so but the communication of these efforts is poor.

5.1.6.4 Management

The management is according to some[42] the most crucial input a company has to secure future success and growth. It has been argued that once a strategy has been chosen and the means needed to carry out that strategy has been acquired, it rests

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[42] Linnéus, 2000-11-02.

solely on management to guide the organization towards that future success. Regardless if you believe that such a high importance should be attributed to management or not, there is no question about it that management carries some weight in the total equation. Once again an external investor most likely would be pretty disappointed in what has been written and also the meaning of what has been written. It seems that information about management most dutifully and nothing more than what is required has been communicated. From the sparse information we have been able to detect some turbulence in MSC's management over the observed period of time but that is also pretty much it. The constitution of upper management and the board of directors are similar to that of most other companies, namely a large majority of men and a small portion of women. Because of its relative unfamiliarity, MSC scores 1 on management index that is based on different surveys carried out by business magazines.

5.1.6.5 Employees

MSC's employees is its most important, according to themselves, input to creating customer value, and it is also in this class that the company receives its highest score. Only two out of ten parameters are left blank and this must be seen as a reflection of the emphasis on employees. Examining the competence profile of the employees reveals that a lower portion of them has a formal upper education as compared to their competitors. Additionally on the negative side is the fact that only 4/5 of total employees is revenue creating and that employee turnover rate seems to be almost out of control. This high turnover rate might have been one of the reasons for a rather low (and declining) value added per employee number. Accessibility is rather high but what stands out is that MSC's employees overall have received poor grades and that brings down the total grade in this class to sub par.

5.1.6.6 Network

The network that MSC acts within and benefits from is by all means unclear to an outside observer. It is also in this class that MSC receives its second worst overall grade. No firm operating in this business can stand on its own, there must be and

there are ramifications pivotal for the future existence for many companies. With this in light we can say that MSC certainly acts within a network that provides channels to new business areas, distribution channels etc. but the description of this network and what it means to MSC is too unclearly communicated. Only the benchmarking of MSC's cooperation with its network leads to a grade higher than 2, namely 3.

5.1.6.7 Brand
Most IT-companies lack a strategy to position their brand in the competition. The authors of an article published in DI even claim that the situation is so bad that all IT-consultant are missing even the most basic building blocks for acting as responsive members of society- something that would result in stronger brand names[43]. Looking into what is written in order to judge the strength of MSC's brand will only lead up to a big question mark. This can not be an area of interest for MSC and they have accordingly received a low overall mark.

5.1.6.8 Customers
Out of the three parameters looked into when judging and grading MSC's customers, none received a grade higher than 2. MSC is mainly serving customers in four different businesses; banking and financial institutions, telecom, travelling and shipment, and insurance. Examples of customers are Ericsson, Postgirot, Skandia and Vattenfall, No indication of the duration of these customer relationships and dependency on their clients have been revealed so MSC has accordingly scored comparatively low in this section.

5.1.7 WM-Data

WM-Data was launched in Stockholm in 1969, at approximately the same time as the Internet was born. Today the company has grown to become one of the largest IT-consultants in the Nordic region with presence in Denmark, Norway, Finland and Sweden. The aspiration, however, is to become a dominant actor on the

European market within the next couple of years. In 1995, sales in Sweden accounted for 87% of total sales but last year that number had decreased to 54% with Denmark as the second largest market with 21% of sales. The number of employees has grown steadily over the years and is of 2000-09-31 8690. WM-Data has proven profitable over the years but has taken a hit lately and actually posted a loss for the first nine months of 2000.

WM-Data is divided into four business areas: Industries, Consulting & Applications, Infrastructure, and New Ventures. Business area Infrastructure accounts for the lion's share of revenues but that is actually a problem for WM-Data since Infrastructure's product hardware and supporting services are hit by declining demand. WM-Data is primarily serving five distinctive markets: telecom, banking & insurance, the public sector, service providers, and traditional industry. The number of customers is very high, decreasing WM-data's dependency on certain customers. Larger customers that can benefit from WM-Data's full range of IT related services are targeted and long lasting relationships with these customers are built.

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[43] Bengtsson & Hugosson, 2000.

Figure 12; WM-Data's different focus areas. Observe the scale on the rating axis.
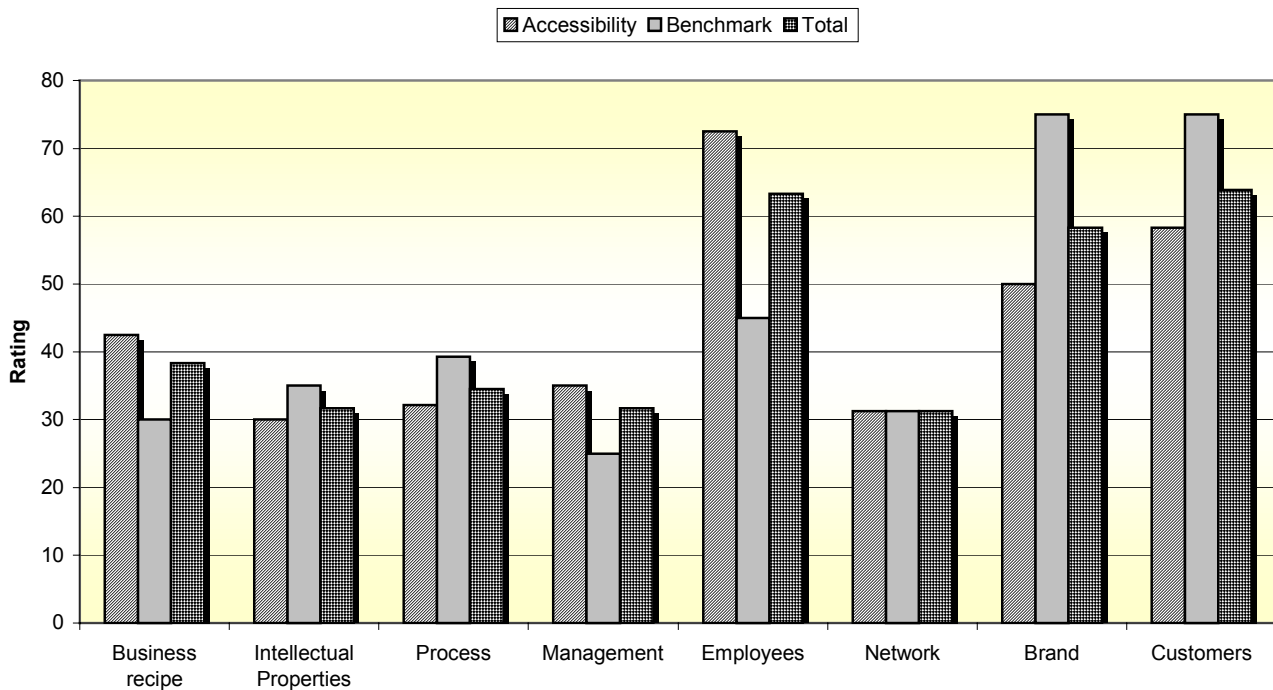
5.1.7.1 Business recipe

The accessible information on WM-Data's business recipe is quite substantial, especially the potential the company has to succeed over the next couple of years is talked about in depth. The commonly shared opinion seems to be that WM-Data is too heavily exposed to stagnating markets and a step towards more lucrative ones is needed in order to safeguard future success. Because of the somewhat dismal future potential the score on benchmarking is set at 2, but accessibility wise WM-Data does well and scores a 4 for this parameter. Another parameter where WM-Data did well was ability to attract competent personnel, indicators for this are the facts that the company is present in all the larger college/university- cities and therefore can build close relationships with the academic world, as well as being recognized as the 17th most attractive working place overall and 3rd among IT-firms by the magazine Universum. Areas where WM-Data did not do so well were distribution channels and the ability to raise capital that were not mentioned

at all and the differentiation strategy the company has chosen that according to some is completely wrong.

5.1.7.2 Intellectual Properties

Revenues generated from licensing agreements have steadily been between 7 and 9% out of total revenues over the past years. WM-Data has entered an agreement with Microsoft to sell their Office package and Volvo are amongst those who have chosen WM-Data as a provider of this package. The Microsoft Office package has a lion's share of the market and is not easily substituted away. Other than the above nothing much can be said about WM-Data's intellectual properties.

5.1.7.3 Process

WM-Data's internal structure is rather well developed and well communicated, with some exceptions. WM-Data has been good at conceptualizing their working methods into formalized models and methodologies, examples of these are PUMA , SUMO, Quattro, and KLÖS that are all intended to make employees more efficient in their day to day work. Another means to improve the shared body of knowledge and recycle gained experiences is through a knowledge database called WMP. WM-Data also seems to have strong supporting functions and help desks that are available 24 hours a day, 365 days a year for assistance. Bringing down the overall grade is the fact that no information at all about administrative costs and processes for internal evaluations are revealed.

5.1.7.4 Management

Upper management has a strong background with several meriting experiences. Whether they were successful or not in fulfilling their previous duties is however unclear. The board of directors is traditionally constituted by a vast majority of men and only one woman. Management turnover has been rather high, especially within Greenhouse (an enterprise within WM-Data where new products and services are developed), bringing down the overall grade. Accessibility to information is at a satisfactory level but comparisons with competitors are hurting WM-Data's score.

5.1.7.5 Employees

The transparency regarding WM-Data's employees is by all means good. Plenty of details about the demographic constitution of this group as well as employee turnover rate and how large a share of them that are revenue generating are available. What hurts is what actually can be interpreted from these facts. The educational level is not very high comparatively, and value added per employee could also be better. WM-Data has several incentive programs for its employees and also sharing of profits but it seems that WM-Data, as well as all other IT-companies, need to find other ways to attract competent people now when many of the highly talked about option programs have turned out worthless in the aftermath of the recent turmoil in the stock market. The development of employee competency at last does not seem to be prioritized and this brings down the overall grade to a still pretty high 63.

5.1.7.6 Network

The network of WM-Data is the area where the company received its lowest overall grade. It might be hard to communicate the details of its network and what this network of partners will mean in terms of benefits in a comprehensive way for a company of WM-Data's size. It would however be beneficial for an outside observer to learn a little more than is the case at present. The company does have a large number of well-known business partners such as Ericsson, Europolitan and Toyota but it is rather unclear what these partnerships will mean to WM-Data. Worth mentioning is that 20% of total turnover is generated in cooperation with its partners.

5.1.7.7 Brand

WM-Data has a comparatively strong brand name. Some of this strength might be the result of being big, it is easier for a large company such as WM-Data to gain recognition by just being exposed and portrayed in numerous different situations and settings. Dagens Industri (large Swedish daily business paper) has an annual listing of the 30 strongest brand names and this year WM-Data was given 26th

place overall and that was one of the reasons why we assigned a high grade to WM-Data's brand name.

5.1.7.8 Customers

Customers at last is the area where WM-Data got its highest grade. Customer relations are long lasting and the repurchase rate is extremely high, when compared to its peers. Dependency on the largest share of customers is extremely low and the impact on total turnover from losing one or a few contracts is therefore low. The 10 largest customers account for 9% of turnover, the 20 largest for 13%, and the 50 largest for 19% of total turnover. The risk of losing customers is also on the low side since most of them are profitable, well established large corporations.

5.2 Analysis - Rating and Volatility

Below are the results of our ratings for the seven companies when each area is given the same importance.

Table 3; Company ratings divided into the eight focus areas. The areas are given the same emphasis.

Area\Company	IMS	Know IT	MSC	Prevas	RKS	Softronic	WM-Data	Weight
Business Recipe	30.83	21.67	29.17	27.50	40.83	32.50	38.33	0.125
Intellectual properties	21.67	0.00	15.00	0.00	28.33	21.67	31.67	0.125
Process	28.57	8.33	21.43	8.33	19.05	34.52	34.52	0.125
Management	13.33	23.33	25.00	41.67	28.33	15.00	31.67	0.125
Employees	25.83	32.50	55.00	35.83	70.00	65.83	63.33	0.125
Network	41.67	12.50	18.75	16.67	22.92	20.83	31.25	0.125
Brand	33.33	8.33	25.00	33.33	8.33	50.00	58.33	0.125
Customers	22.22	33.33	19.44	33.33	41.67	27.78	63.89	0.125
Weighted score	**27.18**	**17.50**	**26.10**	**24.58**	**32.43**	**33.52**	**44.12**	**1.00**

5.2.1 Standard deviation as a measure of volatility

As our measurement of volatility we first chose to use the standard deviation, of the share price, from the average, daily, percentage return. That is, if the stock price for MSC on day one was SEK 100 and on day two 101, the percentage return would be ((101-100)/100=) 0.01 = 1 percent. Should the price on day three then be 103.02, the percentage return on that day would be ((103.02-101)/101=) 0.02 = 2 percent and the average, daily percentage return would be ((1+2)/2=) 1.5 percent for the time period. The equation for the standard deviation is presented in chapter 2.6. For our first analysis of the company ratings, we have chosen to put equal emphasis on all areas in the model (*business recipe, intellectual properties, process, management, employees, network, brand and customers*). This will later be altered so that each area is given a weight according to their importance, as we see it, for the company at hand.

Table 4; Company rating and standard deviation (% units)

Company	Rating	Standard deviation (%-units)
IMS	27.18	6.00
Know IT	17.50	5.92
MSC	26.10	5.40
Prevas	24.58	4.89
RKS	32.43	5.12
Softronic	33.52	6.24
WM-Data	44.12	3.98

From looking at the table above it seems that our hypothesis has a chance! WM-Data has the lowest volatility and the highest rating and Know IT, who clearly has the lowest rating score, are among those with the highest volatility. For further visualization though, we turn to the graph below.

Figure 13; Rating and volatility.
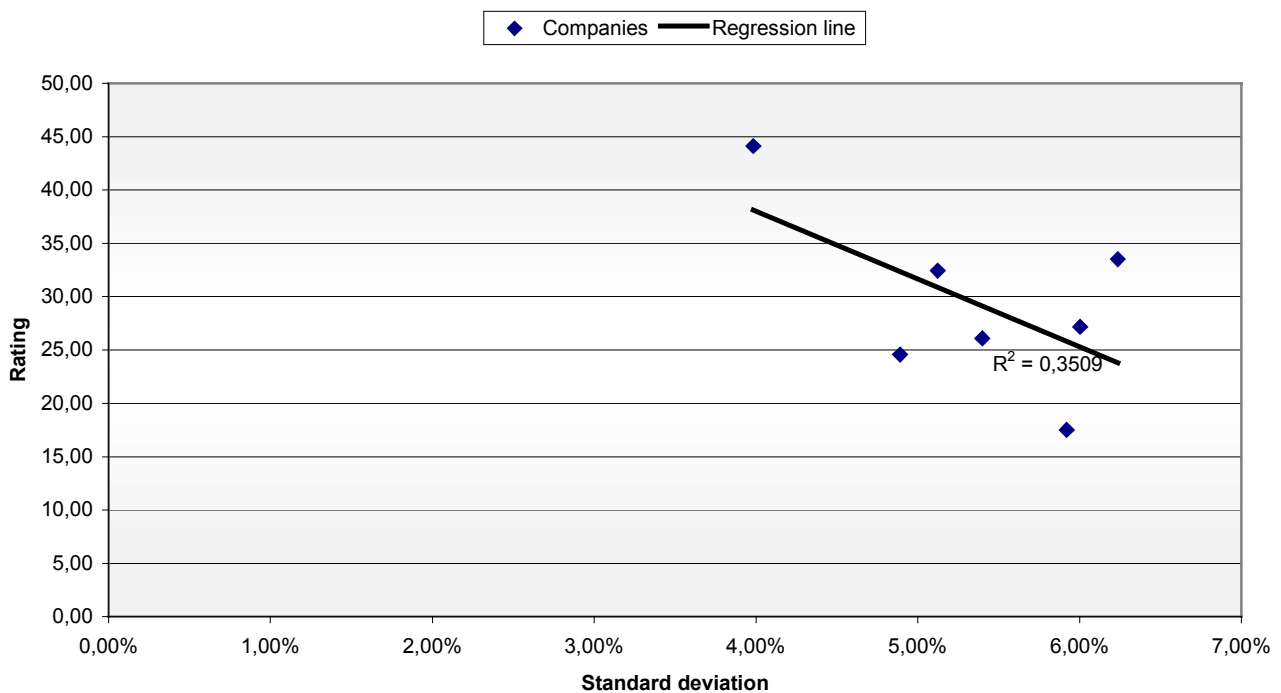
The negative slope on the regression line above indicates that a high transparency, with regards to a company's Intellectual Capital, which would lead to a higher rating score in our developed model which, in turn, would induce a lower share price volatility. In the figure above can also be found the r-square value calculated for the regression line, an r-square of 0.35 indicates the relationship between the rating and the volatility. This r-square value, while sounding "low", is typical in regression studies using cross-sectional data, in which a sample of individuals, or other economic units, are observed at the same point in time.[44] To further test our hypothesis, we will now use other measures for volatility.

5.2.2 Absolute standard deviation as a measure of volatility

As our next measure of volatility we will use the standard deviation in SEK from the average, daily, SEK return on the share price of each company. This is very similar to the first volatility measure analyzed above and our belief is that the results will be similar as well.

Table 5; Rating and standard deviation (SEK).

Company	Rating	Standard deviation (SEK)
IMS	27.18	2.90
Know IT	17.50	9.41
MSC	26.10	5.00
Prevas	24.58	4.73
RKS	32.43	5.86
Softronic	33.52	3.86
WM-Data	44.12	3.31

The ratings in table 5 above are of course the same and therefore WM-Data still remains at the top of that ranking. As opposed to table 4 though, WM-Data does not have the lowest standard deviation i.e. volatility. On the other end of the scale we still find Know IT with the lowest rating and this time also with the highest

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[44] Hill et al, 1997.

volatility. Also differing from table 4 and the volatility measures used there is the relative difference in size between the volatility figures. In table 4, the company with the highest volatility (Softronic, 6.24) was approximately 1.5 times higher than that with the lowest (WM-Data, 3.98). In table 5, Know IT's volatility is more then three times that of IMS, 9.41 and 2.90 respectively. Trying to visualize the relationship we draw the following graph.

Figure 14; Rating and volatility.
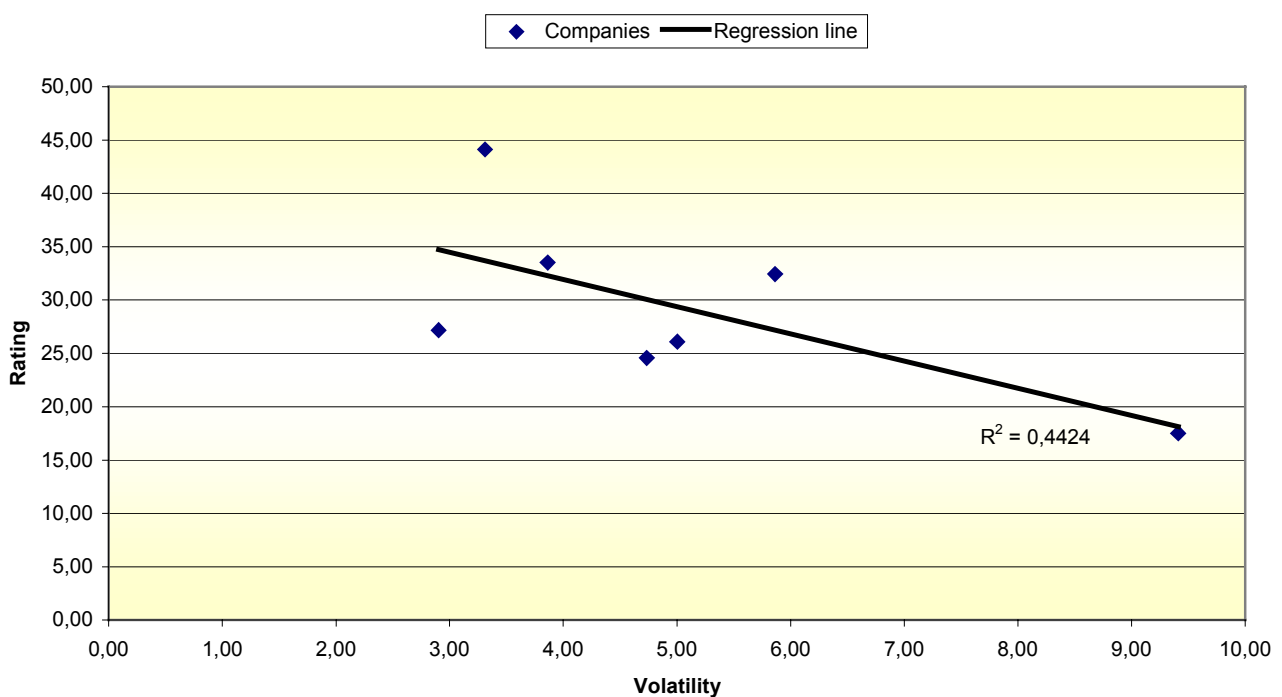
Once again there is a negative slope on the regression line and, as before, this is an indication of the relationship between a high rating and a low volatility. This time the relationship between the rating and the volatility, represented here by the regression line, is even stronger than in the previous case. An r-square value of 0.44 indicates a reasonably strong connection between the transparency, symbolized by the rating, and the stock price volatility for the studied sample.

5.2.3 Standard deviation of the period average price as a measure of volatility

Our two prior volatility measures have shown that there is a connection between the company Intellectual Capital rating and the volatility of the company share price during the researched period. We will now attempt to calculate yet another volatility measurement. For that reason we have looked at the average stock price for the seven companies' shares during the time period chosen (990901 – 000831) and then calculated the standard deviation over the year from that average value. Using these two figures, we have also created the ratio between them. That is, the standard deviation over the share price mean. These are the results.

Table 6; Ratings, mean price over time period, standard deviation and ratio of std.dev. over mean price.

Company (1)	Rating (2)	Mean price (3)	Std. dev. (4)	Ratio (4/3)
IMS	27.18	41.71	17.21	0.41
Know IT	17.50	132.99	53.59	0.40
MSC	26.10	83.89	28.00	0.33
Prevas	24.58	85.00	26.02	0.31
RKS	32.43	109.83	33.96	0.31
Softronic	33.52	55.14	22.88	0.41
WM-Data	44.12	78.90	25.96	0.33

If we look at the ratios we can divide the sample into two groups, four companies (MSC, Prevas, RKS and WM-Data) that have a ratio of 0.31 and 0.33, and three companies with a slightly higher ratio (IMS, Know IT and Softronic) around 0.4. However, there doesn't seem to be any relation between the ratio in column five and the standard deviation in column four, IMS has the lowest standard deviation and Know IT the highest though both have a similar ratio. A regression analysis provides more confirmation of our hypothesis of the connection between transparency and volatility of share prices in our tested sample of companies. This time though, the r-square values are somewhat lower (0.26 and 0.08) and the amount of explanation found in the transparency to explain the market value volatility is meager. A solution would of course be to increase the amount of companies analyzed and rated i.e. increase the sample size. The results of such an

action we can only speculate about but given the indications above, it is quite possible that it would further enhance the proof of the relationship is high transparency/low volatility

5.2.4 Rating compared to alternative measures

The analysis of our rating scores for the seven companies thus far has only been concerned with different measures of volatility and our hypothesis regarding the influence transparency of a company's Intellectual Capital has on the volatility of the market value of the company. We have found that there is a connection but our belief is that increasing the sample size would give stronger indications and allow us to say more about the relationship between transparency and volatility. Unfortunately this is not within our reach for the moment. If we, instead, disregard our hypothesis for a while and look at other indicators common in the market as measures of potential in a company, we may find further proof for the applicability of the model. Shortly, we will see whether our ratings have any relevance when compared to two widespread parameters; Price-to-sales (P/s) and Market Value (MV) over Adjusted Accounted Value (AAV)[45]. The values can be found in the table below.

Table 7; Company rating and two key financial indicators. Source: Finanstidningen.

Company	Rating	P/s	MV/AAV
IMS	27.18	0.18	1.85
Know IT	17.50	0.91	2.64
MSC	26.10	1.23	2.25
Prevas	24.58	2.00	6.49
RKS	32.43	1.36	3.80
Softronic	33.52	2.36	7.74
WM-Data	44.12	1.28	7.75

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[45] Adjusted Accounted Value is 70 or 72 percent of untaxed reserves added to equity.

The share price is comparable to market value with the difference that the amount of outstanding shares is not taken into consideration. Market value, as discussed in the background, can be interpreted as the *financial capital* and the *intellectual capital* added together and, therefore, the MV/AAV-ratio is a measure of the value the market puts on the Intellectual Capital. The figure used for sales, in the denominator in the ratio above, is the expected sales for the year, in this case year 2000. It can be seen as the confidence that the market has for the company to show results and to be successful with its strategies. The ratio then, is a measure of how well the market believes that the company will deliver in the future. A high ratio would indicate that the market has high expectations and faith that the company will be able to show profitability.

Figure 15; Rating and MV/AAV.
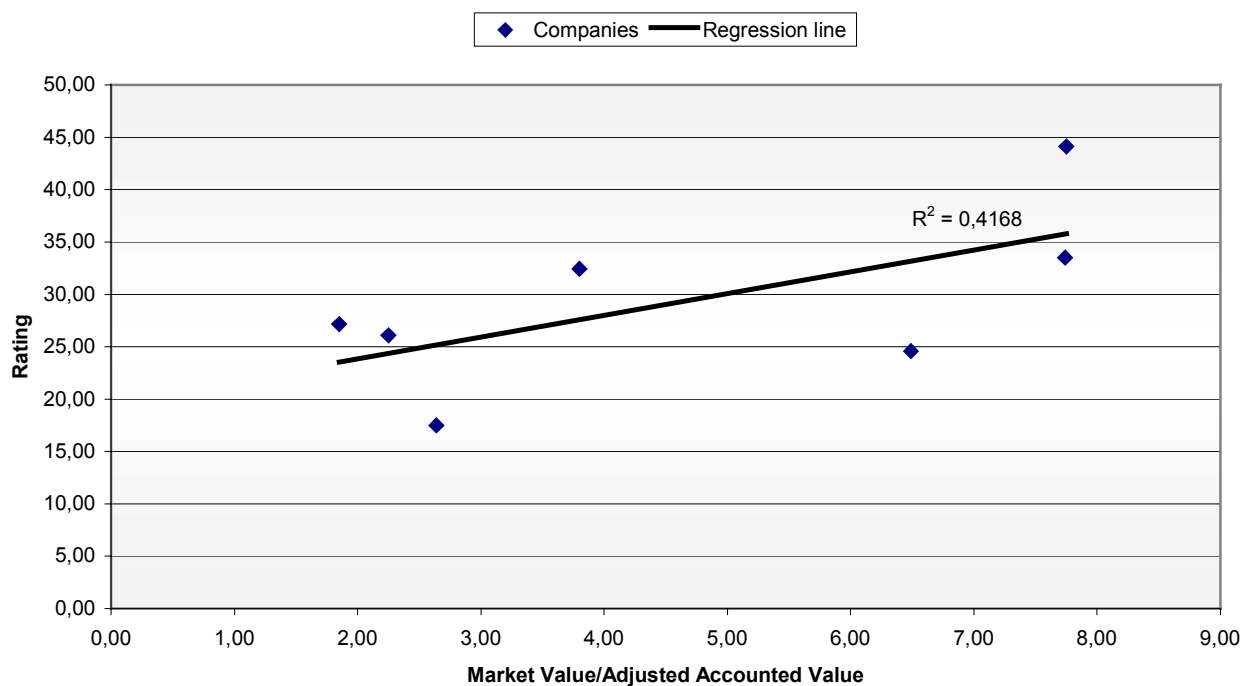
Figure 16; Rating and price to sales.
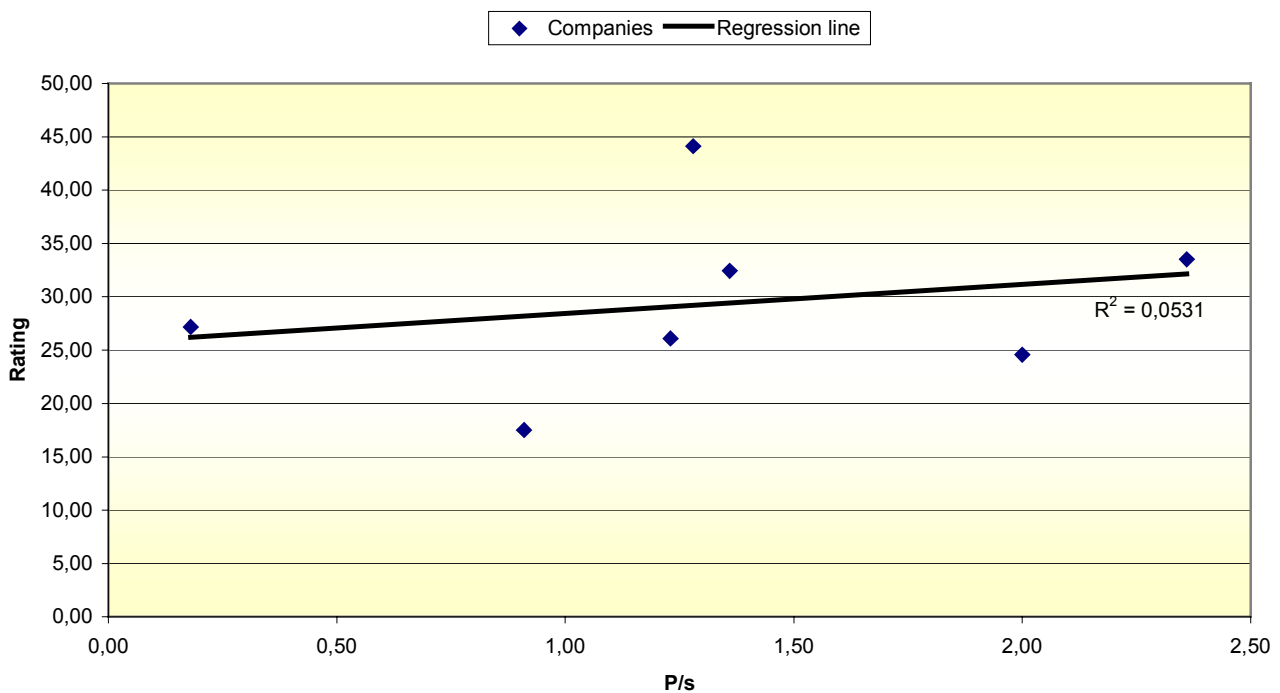
The figures above yet again give us guidance as to the applicability of our model and that it can be used to predict the development and value of a company. Figure 15 shows the second highest r-square value so far indicating that our rating and the MV/AAV-ratio are related which in turn means that our model indeed measures Intellectual Capital. Also in figure 16 the slope of the regression line is positive showing the positive relation between our rating and the size of the price-to-sales ratio. However, the r-square value is close to zero due to the wide spread of the companies in the plot implying a low rate of certainty from knowing one parameter when predicting the other. These tests are performed to increase the validity of the model, that is, that the model actually measures Intellectual Capital, which would mean that our ratings in fact are ratings of a company's Intellectual Capital. The way, in which we, and others,[46] have defined Intellectual Capital is Intellectual Capital is market value when financial capital has been deducted. This corresponds to the first test performed above in this section. The MV/AAV-ratio is

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[46] Edvinsson et al, 1997.

a measure of how much value the market attributes to the company in excess of financial capital, hence Intellectual Capital.

5.3 Alternating area weighting

For reasons of simplification we have, so far, assigned all eight different areas of focus the same emphasis, 1/8. But as discussed in the introduction chapter, different weights assigned to different focus areas will better reflect and visualize strengths and weaknesses of a company with regards to important characteristics of that company. The assigned weights could be due to what business environment a company is in, the type of products and services that are offered etc. An aspect that has been obvious for the sample in this study is the lack of importance assigned to the Intellectual property area. Many IT/Internet consultancy's do not have any license agreements or patents of major importance but are instead more reliant on their human capital i.e. Management and Employees. Therefore, a greater emphasis should be put on this field. For expertise and guidance in this topic, we have turned to ICAB to a great extent. The reason for this is apparent, ICAB have performed a large amount of studies and ratings on various companies and posses critical experience in the matter. After a discussion with ICAB we have assigned weights to the over-arching focus areas *Business recipe, Organization, Human* and *Relation* in the following way: Business recipe is given 10 percent, the reasoning behind this is the fact that we are indeed studying a sample operating more or less in the same business environment. As discussed in chapter 4, we have not considered the dependence for one focus area on another. If we had, the remaining three areas (Organization, Human and Relation) would all be highly reliant on the chosen business recipe and the importance of the area would increase immensely. For this study, however, we have chosen the 10 percent weighting.

Of the remaining three, Human capital is given the highest importance with approximately 40 percent. The consultancy industry are exceptionally dependent on their co-workers and management since these are the assets that are out there everyday representing the company and generating revenues. They are the assets that produce the company's products and services and build a reputation and brand name for the organization, hence the large emphasis put on this area. We have assigned equal emphasis to the two areas underlying Human capital. Our idea was an equal weighting or a 60/40-relationship in favor of employees; however, our interviews indicated that management is of vital importance for a company in the studied industry.

Organization receives approximately 20 percent and finally, Relation capital is given the remaining 30 percent. Following the conceptual framework structure down into the eight focus areas which we have used, it is our belief that Process capital is of far greater importance than Intellectual properties for a IT/Internet company due to issues raised above and the importance in a consultancy to put knowledge sharing into systems to reduce the reliance on the employees.

Relational capital, finally, consists of Network, Brand and Customers. The difficulty in measuring Networks, especially as an external observer, made us assign this area the lowest weight, Brand was given twice that and Customers was given approximately half of the amount given to the entire Relation capital area. Similar to the case of Network, the focus area Brand is very hard for us as novices to evaluate, however, it is our impression that this is an important area for any company. This is especially in a fresh market such as IT/Internet consulting where time to market is stressed strongly. The final weights are presented below together with the new ratings.

Table 8; Company ratings divided into the eight focus areas. The areas are given different emphasis.

Area\Company	IMS	Know IT	MSC	Prevas	RKS	Softronic	WM-Data	Weight
Business Recipe	30.83	21.67	29.17	27.50	40.83	32.50	38.33	0.1
Intellectual properties	21.67	0.00	15.00	0.00	28.33	21.67	31.67	0.045
Process	28.57	8.33	21.43	8.33	19.05	34.52	34.52	0.135
Management	13.33	23.33	25.00	41.67	28.33	15.00	31.67	0.2025
Employees	25.83	32.50	55.00	35.83	70.00	65.83	63.33	0.2025
Network	41.67	12.50	18.75	16.67	22.92	20.83	31.25	0.04725
Brand	33.33	8.33	25.00	33.33	8.33	50.00	58.33	0.0945
Customers	22.22	33.33	19.44	33.33	41.67	27.78	63.89	0.17325
Weighted score	**24.82**	**21.75**	**29.30**	**29.28**	**36.93**	**35.78**	**47.21**	**1.00**

Studying the table above and comparing it to table 3, it seems as if all companies but IMS have improved their rating. The downfall of IMS is the large decrease in pay-off from their relatively strong Network. The importance of this particular area has been reduced to a third of its original weighting and, therefore, doesn't carry the total result as well as it originally did. The individual standings haven't changed in any significant way; Softronic and RKS have changed places but are still very close to each other. How, then, does this change in area weighting affect our hypothesis? To test this we, once again, turned to visual aids for help and, once again, the indications were that a high transparency, signified by a high rating score, leads to a low volatility. In this instance, the r-square was approximately 0.5 hinting at a stronger relationship than previously between the two, and another indication as to the correctness of the hypothesis.

Figure 17; Rating and volatility. Alternative weighting.
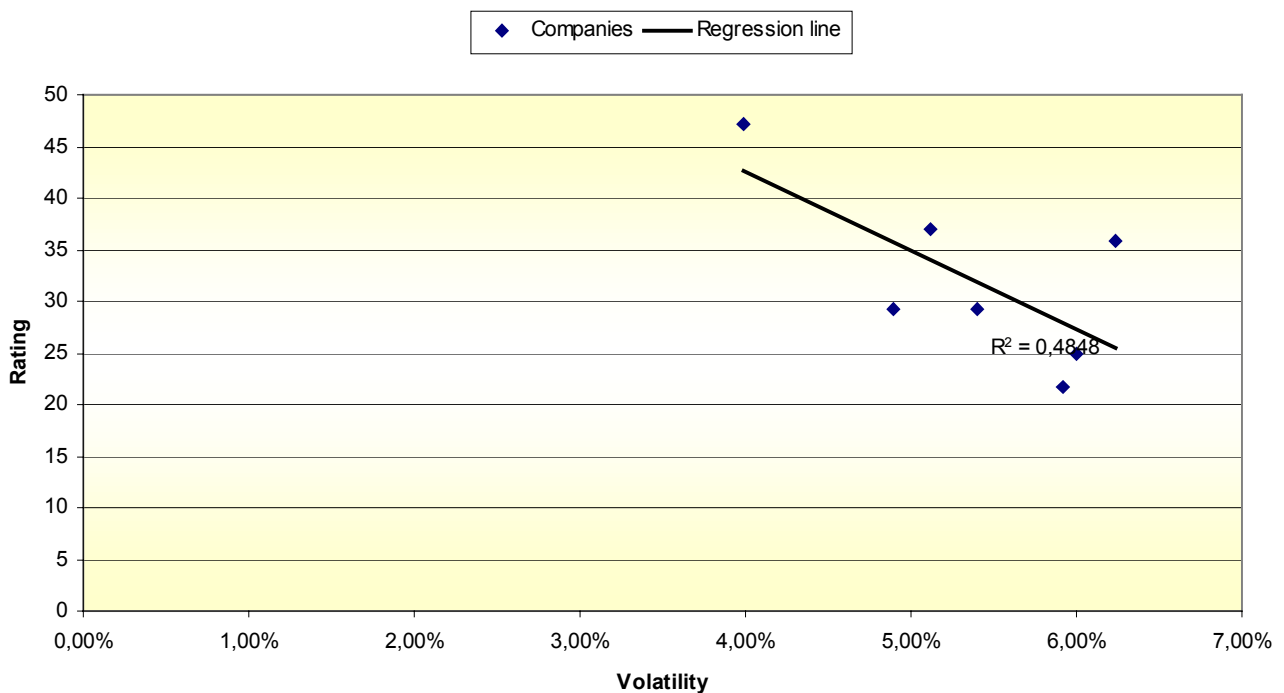
5.4 Analysis – Rating and size

Finally, we wanted to test whether there is a connection between company size and rating. From just looking at the ratings in table 9, it would seem quite plausible that size matters. WM-Data is, without a doubt, by far the largest of the analyzed companies both in number of employees and annual turnover. An issue that is in favor of a large company is that there most likely will be adequate resources to be spent on making the hidden assets more visible. On the other hand though, a smaller company might be easier to grasp and parameters easier to access as compared to a larger one. Furthermore, all the tested companies are noted on the SSE and should be large enough to present sufficient data regarding their IC. The numbers are presented below.

Table 9; Rating and size. Sources: Annual reports for turnover and Internet home page for no. of employees.

Company	Rating	No. of employees	Turnover (MSEK)
IMS	27.18	475	1603
Know IT	17.50	600	548
MSC	26.10	130	115
Prevas	24.58	320	233
RKS	32.43	360	207
Softronic	33.52	360	311
WM-Data	44.12	8690	12720

Similar tests as before were conducted and graphs have been drawn. The results are somewhat ambiguous. When WM-Data is included, the results point to a fairly strong (r-square approximately 0.6) connection both when using number of employees and turnover as a measure of size. However, due to the extreme size advantage of WM-Data, we also performed an equal test excluding this outliner. Without WM-Data there was no association between size and rating, for either size measure. Once again, a larger sample might have given stronger indications.

5.5 Closing Analysis

So far in the analysis we have been very cautious, not stretching the limits or been very provocative. We aren't going to blow the mind of the reader now either but we will allow ourselves to be a tad more outspoken. All the tests performed and presented above point to one thing: our hypothesis sticks! The indications aren't statistically awfully strong, yet they all hint in the same direction. We have presented four measures of volatility all indicating the connection between transparency and stock price volatility. The linkage between these two consists of our developed model. A verification of this model are the above-mentioned tests but also the test of the relationship between the rating and the price to sales ratios, and the MV/AAV-ratio. It goes without saying that further testing of the

hypothesis and model would be desirable before anything is settled and, probably, the easiest way to do so would be to increase the sample size.

To conclude the analysis section something has to be said about one of the key issues that were raised in the problem discussion, namely that of trustworthiness. It is extremely difficult to say anything rational about how much faith that should be put in the different sources of information that go into our model. The lion's share of information that has been used in our analysis come from the analyzed companies themselves and it does not seem far-fetched that some of the information is polished to a certain degree. Mats Larsson[47] of KPA did however point out that the material released from the companies themselves is more trustworthy than that originating outside them.

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[47] Larsson, 2000-11-02

6 Conclusion

In this chapter we will summarize the findings of our study. We will present them according to the questions presented in our purpose. We will also discuss some of the pitfalls of our study as well as give suggestions for further research in relation to this paper.

6.1 Conclusions of the study

To conclude, we will firstly look at the three "questions" posed in our purpose and try to assess to what extent we have answered and lived up to them. **Part one** of the purpose was to *develop a model with which it is possible to grade a company's Intellectual Capital using only publicly available relevant information.* A model has indeed been developed with the aid of available models developed by established experts and professionals in the field of Intellectual Capital. These models, on which our model is based, are highly acclaimed and have been accepted and used by a number of multi million dollar companies. **The second part** of the purpose was to *apply our developed model to a number of companies on the Stockholm Stock Exchange in order to rate the accessibility and quality of their Intellectual Capital.* We have done so by applying it to a sample of IT/Internet consultants, rating the access to information and compared each company to its peers in the sample. These studies have shown that the model is applicable and can be used (for the sample) to visualize and rate IT/Internet consultants Intellectual Capital. **The final part** of the purpose was to *relate each company's score to the volatility of its stock price during the specified period of time.* This has been done using a number of different volatility measures, adding to the validity and applicability of the model. Furthermore, we regressed these rating scores against two common financial measurements; *Market Value over Adjusted Accounted Value* and *Price to sales*. These tests strengthened our belief

in our model. The relationship that has been found is reasonably strong[48] considering that our study is performed using cross-sectional data. All our tests point in the same direction, there seems to be a connection between transparency, with regards to Intellectual Capital, and stock price volatility. The purpose of this thesis and the research performed to answer these questions, all relates back to our hypothesis *the more transparent a company is, in regards to its Intellectual Capital, the less volatile its market value will be.* **On the foundation of our studies presented here we feel that the hypothesis cannot be rejected.**

6.2 For future references

- As we imply in the discussion above, the sample size of this study prevents us from making strong statements and further studies and proof of the relation between transparency and stock price volatility are needed. The obvious way to go is to increase the sample size yet still use the same model and information sources in an attempt to further verify our model and the indications we have arrived at.

- An issue that has also been brought up previously is that of the subjectivity of the auditor. A possible alternative to reduce the subjectivity of the model could be to rely more on key numbers such as those suggested by Edvinsson et al. Our experience, though, has been that these are hard to come by for an external observer and as long as companies are reluctant to include these numbers in their reports, such an evaluation might prove futile.

- Yet another extension of the model developed here is to focus harder on the individual parameters in the first stage of the model. We haven't assigned different weights on a parameter level, but instead added that particular aspect at focus area level. It might be that for each individual company, a certain parameter is of no importance whatsoever and therefore information is not

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[48] Hill et al, states that an r-square of approximately 0.32 is typical for cross-sectional data. More than half of our r-square values are well above that figure.

disclosed. In our model, this has not been accounted for due to ease of applicability and to limit subjectivity in an assessment. The result is that failure to present a parameter of no or little importance has affected the overall rating of the company.

- For those who are more interested in the statistical view of our developed model, a statistically developed multivariate model could be of interest. Using volatility as the dependent variable and regressing it towards the individual focus area weightings could give a clearer insight as to the importance of each focus area for the studied company.

- Important to remember, also, is that an Intellectual Capital assessment is a complement to the more traditional financial assessment. Nevertheless an increasingly important one.

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MSC, Annual report 1999, Quarterly report 3, 1999, Quarterly report 1 & 2, 2000, Press releases issued between 1999-09-01 and 2000-08-31.

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Appendices

Appendix 1 - Parameters going into our model

1- Business recipe

1.1 Potential in terms of growth and profitability in the business environment/segment
1.2 Potential in terms of growth and profitability for the company within its business environment/segment
1.3 Level of competition (substitutes, barriers for entrance, competitors market share etc.)
1.4 Diversification (it is not necessarily positive to well-diversified, company size must be considered)
1.5 Organic growth (in relation to the company's peers)
1.6 Concentration on R & D (R&D expenses)
1.7 Ability to attract skilled employees and management (expressed in media and by the company)
1.8 Distribution channels, in terms of distributor's and customer's comparative strengths
1.9 Sensitivity to overall market conditions
1.10 Ability to raise capital/ accessibility to capital

2- Intellectual properties

2.1 Licenses- in terms of exclusiveness, dependency on licenses for future success, and the potential for these licenses
2.2 Revenues- assessment of dependency on a few licenses/patents
2.3 Time horizon for intellectual properties
2.4 Substitutes to intellectual properties
2.5 Market share for intellectual properties

3- Process

3.1 Administrative expenses per employee (low administrative expenses/employee indicates a good focus on key activities)
3.2 Percentage share of administrative personnel (see 3.1)
3.3 Administrative expenses over total expenses (see 3.1)
3.4 Operating expense per employee (measure of efficiency, see 3.1)
3.5 Processes for internal evaluation
3.6 Measures to conceptualize working methods into standardized procedures- sharing of knowledge (systems for knowledge sharing)
3.7 Help desk and supportive functions

4-Management

4.1 Experience and previous success
4.2 Incentive-/option programs
4.3 Constitution of management, heterogeneous or homogenous in terms of gender, age, educational background etc (a heterogeneous management group should be awarded)

4.4 Turnover rate, defections over the past year (a certain amount of new "blood" is good, however, a balance has to be restored)
4.5 Indicators of strength of management, i.e. annual publication in Dagens Industri

5- Employees

5.1 Gender distribution (a too large share of men is penalized)
5.2 Age structure (see 4.4)
5.3 Educational level (high and relevant education is awarded)
5.4 Trainee opportunities
5.5 Share of revenue generating employees (a high portion of revenue generating employees is sought)
5.6 Employee turnover (see 4.4)
5.7 Incentive-/option programs (a means to motivate personal)
5.8 Value added per employee
5.9 Employment duration (see 4.4)
5.10 Development of individual competencies (time, money spent, an indication of future success)

6- Network

6.1 Partners, in terms of size, frequency, duration etc.
6.2 What do the company's partnerships mean in terms of access to certain inputs, distribution-channels, publicity etc.
6.3 Degree of utilization of network, in terms of how large a share of the company's products/services are produced/delivered/developed in cooperation with the network

6.4 Representation at exhibitions, career days etc. with the intention of strengthening current networks and creating new ones

7- Brand

7.1 An all-overarching grade is handed out to represent the perceived strength and knowledge of the brand name. Factors determining this grade are for example examinations carried out in various magazines and periodicals, the company's ability to position its brand name etc.

8- Customers

8.1 Duration, stability, frequency of repurchase
8.2 Dependency on customer(s), measured in terms of i.e. 5 or 10 largest customers' share of total revenues (a high dependency on one or a few customers is considered a risk)
8.3 Image enhancing customers, market potential and market share for these customers

Appendix 2 – Company Ratings

IMS

Parameter	Weighted grade	Accessibility	Benchmark
1.1	3.00	3	3
1.2	4.00	4	4
1.3	1.00	1	1
1.4	2.33	2	3
1.5	2.33	2	3
1.6	1.00	1	1
1.7	2.00	2	2
1.8	3.33	3	4
1.9	1.00	1	1
1.10	2.33	2	3
2.1	2.00	2	2
2.2	3.33	3	4
2.3	2.00	2	2
2.4	1.00	1	1
2.5	1.00	1	1
3.1	3.00	3	3
3.2	2.00	2	2
3.3	3.00	3	3
3.4	1.00	1	1
3.5	2.66	3	2
3.6	1.00	1	1
3.7	2.33	2	3
4.1	2.33	2	3
4.2	1.00	1	1
4.3	2.33	3	1
4.4	1.00	1	1
4.5	1.00	1	1
5.1	4.33	5	3
5.2	1.00	1	1
5.3	1.00	1	1
5.4	1.00	1	1
5.5	2.33	2	3
5.6	2.00	2	2
5.7	2.00	2	2
5.8	2.33	3	1
5.9	1.00	1	1
5.10	3.33	3	4
6.1	3.66	4	3
6.2	3.66	4	3
6.3	1.00	1	1
6.4	2.33	2	3
7.1	2.33	2	3
8.1	2.00	2	2
8.2	1.66	2	1
8.3	2.00	2	2

Know IT

Parameter	Weighted grade	Accessibility	Benchmark
1.1	2.00	2	2
1.2	2.33	2	3
1.3	1.00	1	1
1.4	1.00	1	1
1.5	5.00	5	5
1.6	3.00	3	3
1.7	1.33	1	2
1.8	1.00	1	1
1.9	1.00	1	1
1.10	1.00	1	1
2.1	1.00	1	1
2.2	1.00	1	1
2.3	1.00	1	1
2.4	1.00	1	1
2.5	1.00	1	1
3.1	1.00	1	1
3.2	1.00	1	1
3.3	1.00	1	1
3.4	1.00	1	1
3.5	1.00	1	1
3.6	3.33	3	4
3.7	1.00	1	1
4.1	2.33	2	3
4.2	1.00	1	1
4.3	2.33	2	3
4.4	3.00	4	1
4.5	1.00	1	1
5.1	4.33	5	3
5.2	1.00	1	1
5.3	4.33	4	5
5.4	1.00	1	1
5.5	1.00	1	1
5.6	2.00	2	2
5.7	2.00	2	2
5.8	4.00	5	2
5.9	1.00	1	1
5.10	2.33	2	3
6.1	3.00	3	3
6.2	1.00	1	1
6.3	1.00	1	1
6.4	1.00	1	1
7.1	1.33	1	2
8.1	1.67	2	1
8.2	3.33	3	4
8.3	2.00	2	2

MSC

Parameter	Weighted grade	Accessibility	Benchmark
1.1	3.33	3	4
1.2	2.33	2	3
1.3	1.00	1	1
1.4	3.33	3	4
1.5	4.00	5	2
1.6	1.33	1	2
1.7	2.67	3	2
1.8	1.00	1	1
1.9	1.00	1	1
1.10	1.67	2	1
2.1	2.33	2	3
2.2	1.00	1	1
2.3	1.67	1	3
2.4	1.00	1	1
2.5	2.00	2	2
3.1	1.00	1	1
3.2	2.00	2	2
3.3	1.00	1	1
3.4	1.00	1	1
3.5	2.67	3	2
3.6	3.33	3	4
3.7	2.00	2	2
4.1	2.00	2	2
4.2	1.67	2	1
4.3	2.67	3	2
4.4	2.67	3	2
4.5	1.00	1	1
5.1	4.67	5	4
5.2	1.00	1	1
5.3	4.33	5	3
5.4	1.00	1	1
5.5	4.00	5	2
5.6	3.67	5	1
5.7	2.67	3	2
5.8	4.33	5	3
5.9	4.33	5	3
5.10	2.00	2	2
6.1	2.00	2	2
6.2	2.33	2	3
6.3	1.00	1	1
6.4	1.67	2	1
7.1	2.00	2	2
8.1	1.67	2	1
8.2	1.67	2	1
8.3	2.00	2	2

Prevas

Parameter	Weighted grade	Accessibility	Benchmark
1.1	1.67	1	3
1.2	3.67	4	3
1.3	2.67	2	4
1.4	2.33	2	3
1.5	4.67	5	4
1.6	1.00	1	1
1.7	2.00	2	2
1.8	1.00	1	1
1.9	1.00	1	1
1.10	1.00	1	1
2.1	1.00	1	1
2.2	1.00	1	1
2.3	1.00	1	1
2.4	1.00	1	1
2.5	1.00	1	1
3.1	1.00	1	1
3.2	1.00	1	1
3.3	1.00	1	1
3.4	1.00	1	1
3.5	1.00	1	1
3.6	3.33	3	4
3.7	1.00	1	1
4.1	3.33	3	4
4.2	1.00	1	1
4.3	2.67	3	2
4.4	3.00	3	3
4.5	3.33	3	4
5.1	1.00	1	1
5.2	4.33	5	3
5.3	4.67	5	4
5.4	1.00	1	1
5.5	1.00	1	1
5.6	4.67	5	4
5.7	2.67	3	2
5.8	3.00	3	3
5.9	1.00	1	1
5.10	1.00	1	1
6.1	2.00	2	2
6.2	1.00	1	1
6.3	2.00	2	2
6.4	1.67	2	1
7.1	2.33	2	3
8.1	2.33	3	1
8.2	2.67	3	2
8.3	2.00	2	2

RKS

Parameter	Weighted grade	Accessibility	Benchmark
1.1	4.00	5	2
1.2	3.00	3	3
1.3	2.33	2	3
1.4	2.67	2	4
1.5	5.00	5	5
1.6	2.33	2	3
1.7	2.67	3	2
1.8	1.00	1	1
1.9	1.00	1	1
1.10	2.33	2	3
2.1	3.00	3	3
2.2	3.00	3	3
2.3	1.00	1	1
2.4	1.00	1	1
2.5	2.67	2	4
3.1	1.00	1	1
3.2	1.00	1	1
3.3	1.00	1	1
3.4	1.00	1	1
3.5	4.00	4	4
3.6	3.33	3	4
3.7	1.00	1	1
4.1	3.00	3	3
4.2	1.00	1	1
4.3	2.67	3	2
4.4	3.00	3	3
4.5	1.00	1	1
5.1	4.33	5	3
5.2	4.33	5	3
5.3	4.33	4	5
5.4	4.67	5	4
5.5	2.67	2	4
5.6	4.67	5	4
5.7	4.00	4	4
5.8	3.33	3	4
5.9	1.00	1	1
5.10	4.67	5	4
6.1	3.00	3	3
6.2	1.00	1	1
6.3	1.00	1	1
6.4	2.67	3	2
7.1	1.33	1	2
8.1	3.33	4	2
8.2	2.67	3	2
8.3	2.00	2	2

Softronic

Parameter	Weighted grade	Accessibility	Benchmark
1.1	2.00	1	4
1.2	3.33	3	4
1.3	1.00	1	1
1.4	1.33	1	2
1.5	2.00	2	2
1.6	3.00	3	3
1.7	2.67	3	2
1.8	3.00	3	3
1.9	2.67	2	4
1.10	2.00	2	2
2.1	3.33	3	4
2.2	3.00	3	3
2.3	1.00	1	1
2.4	1.00	1	1
2.5	1.00	1	1
3.1	1.00	1	1
3.2	2.33	2	3
3.3	1.00	1	1
3.4	3.33	3	4
3.5	4.67	5	4
3.6	3.33	3	4
3.7	1.00	1	1
4.1	2.33	2	3
4.2	1.00	1	1
4.3	2.67	3	2
4.4	1.00	1	1
4.5	1.00	1	1
5.1	4.00	5	2
5.2	3.67	4	3
5.3	4.00	4	4
5.4	3.33	4	2
5.5	3.67	4	3
5.6	4.33	5	3
5.7	2.00	2	2
5.8	4.67	5	4
5.9	4.33	5	3
5.10	2.33	2	3
6.1	3.33	3	4
6.2	1.00	1	1
6.3	1.00	1	1
6.4	2.00	2	2
7.1	3.00	3	3
8.1	1.67	2	1
8.2	2.67	3	2
8.3	2.00	2	2

WM-Data

Parameter	Weighted grade	Accessibility	Benchmark
1.1	2.67	3	2
1.2	3.33	4	2
1.3	2.00	2	2
1.4	2.00	2	2
1.5	4.00	5	2
1.6	2.33	2	3
1.7	4.00	4	4
1.8	1.00	1	1
1.9	3.00	3	3
1.10	1.00	1	1
2.1	2.00	2	2
2.2	4.00	4	4
2.3	1.00	1	1
2.4	3.33	3	4
2.5	1.00	1	1
3.1	1.00	1	1
3.2	2.33	2	3
3.3	1.00	1	1
3.4	3.00	3	3
3.5	1.00	1	1
3.6	4.67	5	4
3.7	3.67	3	5
4.1	2.33	2	3
4.2	2.00	2	2
4.3	2.67	3	2
4.4	3.33	4	2
4.5	1.00	1	1
5.1	4.67	5	4
5.2	3.67	4	3
5.3	3.67	4	3
5.4	1.00	1	1
5.5	4.67	5	4
5.6	4.33	5	3
5.7	4.33	5	3
5.8	4.33	5	3
5.9	3.00	3	3
5.10	1.67	2	1
6.1	2.33	2	3
6.2	2.00	2	2
6.3	3.67	4	3
6.4	1.00	1	1
7.1	3.33	3	4
8.1	3.33	3	4
8.2	4.33	4	5
8.3	3.00	3	3