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# **Effort to Map the Intellectual Capital in Skåne**

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**ABSTRACT**

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- Title:** Effort to Map the Intellectual Capital in Skåne
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- Keywords:** Skåne, Scania, Intelligence, Intellectual Capital, Municipal Intelligence, Human Capital, Structural Capital, Regional benchmarking, IC of Regions, External Resources
- Problem:** Only using financial measures creates a one-dimensional navigation system with which it is easy to get lost. Added information will transform this into a multidimensional system where hazards and opportunities are easier to recognise. In the increased competitive economic environment this could be an edge that could be used to provide basics for growth and prosperity to municipalities. Is it possible to provide Skåne and apply the theory of intellectual capital with new information to create a more intelligence for a society where all resources are used in the best way possible to create a considerable multiplier effect?
- Purpose:** The aim is to review the intellectual capital in Skåne on a municipal level and create a prototype of a regional intellectual map. We aim to review a number of methods used to map the intellectual capital, select and modify a method that we deem most appropriate.
- Method:** The method is divided into five phases. First the concept of intellectual capital is established through literature studies, then four established methods are reviewed and finally the model is applied on Skåne
- Conclusion:** This study has showed that the human capital is concentrated in the western parts of Skåne and predominantly close to the largest cities. Relation capital plays an important role for municipalities in order to achieve reach of the resources within the municipality and to use external resources within reach. Insourcing and outsourcing of resources could improve the performance and leverage on the intellectual capital. The reach of the internal resources and the supply of external resources within reach are probably more important than the administration of the municipality and the administration should shift focus accordingly. The inability to do this could result in *municipal impotence* – the inability to perform albeit textbook settings. Finally the current division of Skåne in 33 municipalities might be antiquated and inefficient – maybe the intellectual capital could get more turbo by leveraging several municipalities' collective resources.

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# 1 Introduction

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*This chapter will present to the reader an overview of the thesis and an introduction to the topic of intellectual capital and the importance of it to municipalities. The problem formulation and purpose will be presented along with the structure and disposition of the thesis.*

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## 1.1 Background

*"The international competition is intensifying. Sweden's neighbouring countries in Scandinavia and northern Europe offer perfect alternatives in research and development and production of goods and services. The Baltic, Central and Eastern European countries offer high competence often at low cost. At the same time both basic and advanced production is relocated to less developed Eastern European countries or Asia." – (Invest in Sweden Agency, NUTEK, VINNOVA)*

Ever heard of intellectual capital, knowledge capital, knowledge organisations, learning organisations, organisational learning, information age, knowledge era, information assets, intangible assets, intangible management, hidden value or human capital? These terms and others are part of a new lexicon describing new forms of economic value ([www.business.mcmaster.ca](http://www.business.mcmaster.ca)).

There is an ongoing shift from an industrial economy to a knowledge economy where people are the most important factors of production. Employment in developed countries will not be within manufacturing or producing industries as it will be impossible to compete with low-cost regions. Increasing globalisation and further integration and expansion of the European Union (EU) will change the role of the nation. A normalisation of taxation, educational and social systems will erode on prior competitiveness and the possibility for diversification in individual countries. The globalisation and mobility has increased the opportunity for people to relocate. People can with greater than ever communication technology easily search and find the advantages that different regions offer and then choose to relocate to the region that offers the highest benefits and quality of life. The ability to offer a high quality of life becomes a competitive advantage when it comes to attracting intellectual capital. People's propensity to relocate to areas that gives them the highest possible yield on their human capital has steadily increased in Sweden (Ljungdal, 2004).

In order to retain the level of social welfare countries and regions have to create comparative advantages and thereby attract people and human capital. This in turn creates enterprises, employment, innovation and growth that drive the community forward. There are many different ways to measure welfare; among them the incumbent measure - Gross Domestic Product (GDP). GDP has been criticised for not explaining variables that also bring welfare; such as environment, democracy, crime rate and leisure. Sweden is, according to Statistics Sweden (SCB), gradually losing altitude in indices that measure GDP per capita while Sweden receives top-level ranking in other welfare rankings such as "Happy Life Expectancy" (Björklund, 2004).

Recently Robert Huggins Associates published their yearly "World Knowledge Competitiveness Index" ([www.hugginsassociates.com](http://www.hugginsassociates.com)). In this index 125 regions' knowledge capital is benchmarked to map out to which extent this is converted into economic wealth and affluence for the people in the region. They compare indicators as patents, investments in research and development (R&D), level of education and infrastructure. Stockholm (Sweden) was ranked 18<sup>th</sup> and the south of Sweden 72<sup>nd</sup>. Heading the ranking is San Francisco (USA) and in the bottom Bangalore (India) is found.

Darwin's "*survival of the fittest*" is yet again of current interest – regions that can attract and keep human capital and thereby leverage on their structural capital will win the race. With this both threats and opportunities will surface and the ability of cities, municipalities and regions to adapt and create strategies to attract creative people will be critical. The ability to choose and enter alliances with the right region in order to cope with the increasing competition will be essential. The capacity to swiftly integrate and utilise immigrated human capital will play a vital role.

The region of Skåne (southern Sweden, in English sometimes called Scania but in this thesis called Skåne) is identified to be a key region in the next years to come and a development program was re-launched on 20 April 2004 to facilitate the progress of the region. The program identifies important areas that need to be developed in order to improve the region and to make it more attractive to people, companies and institutions. Central administration of Skåne (Region Skåne) has selected twelve indicators (see p. 35) to measure the progress of the region (Skånsk Livskraft..., 2004). The region consists of 33 municipalities that all affect the outcome of the program and therefore the mapping of the resources in each municipality should provide important information to build strategies in the region. The approach Region Skåne has adopted is a way of describing the intellectual capital of the region on a regional level, but so far the information on municipal level is limited.

It is difficult to find and investigate conditions, resources and linkages that result in innovation and growth. There is however a framework that has shown to make this possible - the presence of intellectual capital. Intellectual capital can be divided into structural capital and human capital. Human capital consists of the brainpower, knowledge and insights that people contribute with to the region ([www.unic.net](http://www.unic.net)). Structural capital consists of capital tied in customers, processes, databases, trademarks, brands and systems. Intelligent capital can be utilised by transforming knowledge and intangible assets to value creating resources by multiplying the human capital with the structural capital ([www.unic.net](http://www.unic.net)). Today a growing consensus describes IC with three major blocks; human capital, structural capital with organisational capital as well as relation capital

## **1.2 Problem formulation**

Intellectual capital is important for the productivity and competitiveness of companies as well as regions and countries. Performance can be measured on three levels; output, outcome and impact (Edvinsson, 2004). The problem for both private and public organisations is that traditional accounting primarily focuses on financial assets and historical data – the output. Intangibles such as

knowledge, R&D, education, quality of life and the environment – the outcome - are not taken into account. Municipalities must, in order to allocate its resources in an efficient manner, get hold of a regional map of the intellectual capital in order to utilise the resources more efficiently – in order to get impact on welfare and sustainable wealth. (Edvinsson & Malone, 1997).

Benchmarking municipalities could provide not only a ranking but also an identification of strengths and weaknesses for the different area, where complement resources are to be found and what to develop in the future. This information could provide a guide to cities and municipalities when developing future strategies and creating alliances. What is a weakness today can be developed into a strength tomorrow. The situation today is that, as far as the authors are aware, there are no such publications or benchmarks of intellectual capital in the region of Skåne on municipality level. The allocation system for government subsidies are strictly dependant on financial measures and municipalities are consequently managed according to that. There is a lack of information and benchmarking that we aim to investigate and hopefully fill. A benchmark would provide a map of the resources in the region that can be used by municipalities and central administration in investment allocation and future planning.

Edvinsson describes the use of only financial measures as a one-dimensional navigation system with which it is easy to get lost. With additional information this will transform into a multidimensional navigation system where hazards and opportunities are easier to recognise. In the increased competitive economic environment this could prove to be an edge that could be used to provide prerequisites for growth and prosperity to the region. How does the intellectual capital of the individual municipalities look like in the region of Skåne? Where are the resources located and how well are they utilised? Is the human and structural capital used in a coordinated way that gives rise to competitive advantages in the region? Is it possible that some municipalities do not get the investments and focus they should? Is it possible to supply the municipalities with new and relevant information using intellectual capital? Will people move to a specific municipality as a consequence of high score in IC-benchmarking? Which are the factors making a municipality intelligent and is it important with intelligent and creative municipalities? Is a high level of intelligence the most important or who uses its intelligence in the most efficient way? And most important of all – is it even possible to measure the intellectual capital on municipality level?

### **1.3 Purpose**

The purpose is to review the intellectual capital in Skåne on a municipal level and create a regional prototype of an intellectual map. We aim to review a number of methods used to map the intellectual capital, select, refine and test a method that we deem most appropriate.

## 1.4 Target group

The target group for this study is students, municipalities, national authorities and others with an interest in regional intellectual capital. This thesis can also provide guidance for municipal authorities in their development of regional strategy.

## 1.5 Disposition

Chapter one and two are strictly introduction and methodology chapters. The subsequent chapters, three and four, both discuss theoretical issues in two different ways – the first presents the models we intend to review, the second presents the importance of intelligence and knowledge on both national and municipal level. In the fifth chapter the empirical research and results will be presented and the emerging approach for the model finally used is discussed. In the sixth chapter we will present the analysis and in chapter seven finish with conclusions drawn.

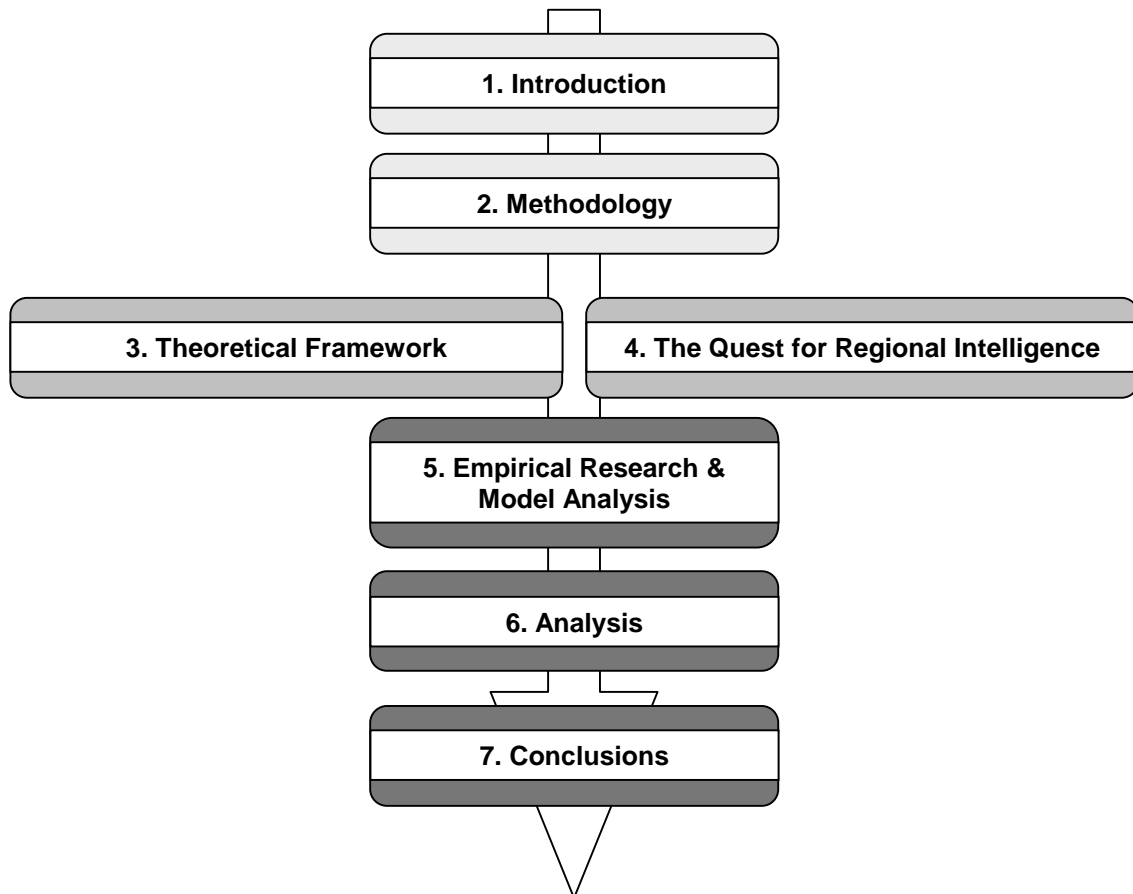


Figure 1.1: Conceptual Disposition of Thesis

### Chapter 1 - Introduction

This chapter will present to the reader an overview of the thesis and an introduction to the topic of intellectual capital and the importance of it to municipalities. The problem formulation and purpose will be presented along with the structure and disposition of the thesis.

### Chapter 2 - Methodology



This chapter will introduce to the reader an overview of the research method and guide the reader through the research process. Conceptions such as validity and reliability will be discussed and a classification of the sources used will be presented.

### *Chapter 3 – Theoretical Framework*

In this chapter the theories that will give a history and present standing of concepts such as intellectual capital, IC of nations and IC of municipalities are presented to the reader. Thereafter four established models for assessing IC will be presented and finally summarised.

### *Chapter 4 – The Quest for Regional Intelligence*

In the fourth chapter the quest for intelligence among nations and municipalities will be explained and the concept of intellectual capital is put into context. Examples of implementations will be given and a distinction of intelligence will be presented.

### *Chapter 5 - Empirical Research & Model Analysis*

In the fifth chapter the empirical research method will be furthered explained. That is, what we are trying to describe, with which indicators we will describe it and most importantly a motivation why we chose the selected method and indicators. Reviewed models will be assessed and the final model will be applied and the results presented. This chapter will also contain some analysis since it is impossible to divide critical review from analysis at some point.

### *Chapter 6 - Analysis*

In this, the sixth, chapter the results of the study will be analysed and discussed. Further the outcomes and possible reasons of the outcomes, consequences and anomalies will be analysed and put into context. There will also be an interpretation of the region for future strategy development and management.

### *Chapter 7 – Conclusions*

In the final chapter of this thesis the lessons learnt and the conclusions drawn will be presented. Based on the conclusions of this thesis there will be further research proposals in the end giving examples of how to take this study one step further to increased regional awareness and knowledge.

## 2 Methodology

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*This chapter will introduce to the reader an overview of the research method and guide the reader through the research process. Conceptions such as validity and reliability will be discussed and a classification of the sources used will be presented.*

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### 2.1 Initial approach

Competition among regions and increased mobility in the society has made it important to have a regional strategy for growth to survive. There are ongoing intensive debates between the government and the business world about how to create growth and innovation on a national, regional and municipal level. The interest in intellectual capital arose attending a lecture at Lund School of Management & Economics. The professor lectured the importance of intellectual capital to create growth and innovation in corporations as well as in regions. There are many point of views about how recourses are allocated, but very few mappings of how the intellectual capital looks like in Skåne, especially on municipal and city level. This could be a consequence of the political controversy about ranking municipalities even though a ranking would facilitate their strategic planning. This lack of information we found intriguing, interesting and challenging. A number of methods were identified, along with our tutor, that will be evaluated and then form a base for the approach. Then the intellectual capital in Skåne will be evaluated and mapped.

Intellectual capital (IC) is in itself a difficult concept to define and the prior purpose is not to investigate how to measure IC in the best possible way since it is work in progress globally. It would though be interesting to try to design a framework that will simplify a recurring mapping and ranking of IC on municipal level. To measure IC on municipal level is nothing easy and at this state it is not possible to tell whether the best indicators are available or not – and therefore this could easily affect the validity of this research. Although the focus is not primarily to decide and research how IC is best measured it will affect the credibility of the results of the research project. In the theory chapter four selected models of evaluating regional intellectual capital will be presented. Then trying to establish strengths, weaknesses and different in the various models and modify one, or several, of the evaluated models on the municipalities of Skåne. The intention is to accomplish a report that will provide a map of the IC in the region. The various methods used in previously performed studies are going to be critically assessed and then evaluated to establish whether it is relevant and interesting to apply it to the selected region. The second step is to collect all data needed and apply the method on Skåne and evaluate whether it is reliable or not. Finally the results and the indicators used will be discussed to see if it is possible to improve and refine a model.

## **2.2 The Research Process**

The research process is divided into five phases, which supplies the investigation with different aspects and are accomplished in different methodical ways. To be able to fulfil the purpose both a qualitative and a quantitative approach must be used. The qualitative method aims to understand, while the quantitative method has an explaining purpose (Holme & Solvang, 1997). With this in mind the qualitative method is used in the first phases of this thesis. This will give a deeper insight and understanding regarding intellectual capital and the methods used in previous studies. To divide investigations into qualitative and quantitative models has an important purpose as the judgement and usage of a model is different when the approach is quantitative from when it is qualitative (Wiedersheim-Paul, 1992). In the second phase different models of IC measuring will be reviewed and evaluated with a critical, academically point of view. The first formulation of a model is usually of a qualitative approach. The intention with this thesis is to describe a phenomenon – to describe a subject cannot be done unbiased; we have to choose perspective, aspects, conceptions, level etc (Wiedersheim-Paul, 1992). In the third phase a model to measure IC in municipalities will be applied and developed. From this phase onwards the method used is shifted towards a more quantitative approach, where the aim is to try to explain a qualitative phenomenon with a quantitative model. In the fourth phase official statistics will be gathered and the project will be executed. In the fifth and final phase the results will be analysed and hopefully some conclusions will be drawn. The phases do not represent the different chapters in the thesis, just the research process.

### **2.2.1 Phase One - Establishing the Concept of Intellectual Capital**

In the first phase literature in the topic will be studied to understand the concept of intellectual capital and to establish the prerequisites for validity in assessing the intellectual capital. A common reaction on measuring of intellectual capital is “that is impossible to measure”. Intellectual capital is in some ways controversial and proposes a new way of valuing with intelligence instead of financial values. The theory of intellectual capital is fairly new and the aim is to get a thorough understanding of the topic before proceeding to the next phase. Intellectual capital is difficult to define in a unanimous way and various researchers and practitioners use different definitions and classifications when dealing with the topic. In this first phase the aim is also to get many sources of input to establish a deep understanding and definition of the phenomenon of intellectual capital. By studying books and articles published by the most influential practitioners of IC the mean is to establish our distinction of intellectual capital, as well as IC of nations and IC of municipalities, and present it to the reader. Giving ourselves and the readers a concordant distinction of IC is a prerequisite for the continuing work. In addition to IC practitioners we aim to get input from academics researching in economic and community development in order to establish what is important for communities and regions to develop. In this phase it is established exactly what we want to measure - a definition and drivers of IC. By doing this the thesis can proceed to phase two; assessing the established methods.

### 2.2.2 Phase Two – Assessing the Established Methods

In the second phase four methods used to evaluate regional IC are going to be reviewed and thereafter evaluated with an academic and critical point of view. After having defined intellectual capital and the concept of IC of nations four selected methods will proceed to be evaluated; *NICI* (Bontis, 2004), *VAIC* (Pulic, 2003), *IC-dVAL* (Bonfour, 2003, 2004) and *ICBS* (Viedma, 2001, 2002). The methods were chosen together with our tutor and they represent recognised methods on how to measure intellectual capital. They also represent four different approaches and provide different types of results. The methods are quite complex and the purpose of presenting them is for the reader to get some theoretical input and a conceptual understanding of what has been previously done in the area of measuring intellectual capital.

This phase of the study focuses on the measurement of intellectual capital. The methods presented show that it is possible to measure IC, but at this point it is strictly a presentation of the theory around the methods with no attempt to evaluate them. By evaluating the methods and putting them in a context of national and municipal IC the purpose is to establish an approach that captures the intellectual capital in an understandable, reliable and credible way.

For the thesis to lead to new or reinforced knowledge the authors must critically assess what is already written (Widesheim-Paul, 1992). In order to develop a creative-critical thinking the author must liberate herself from ingrained notions and in that way liberate the intellectual capacity. The critical tradition of science values reliability, validity and objectivity. There are three things that researchers can address to develop critical thinking (Widesheim-Paul, 1992);

- Are there other alternatives?
- Are there other prerequisites?
- Wait to value the thinking

Critical theory is characterised by construe and empirical tests. It is subjective, objective and critical (Widersheim-Paul, 1992). Using this critical thinking and be able to evaluate the selected models, the aim is to find whether they are relevant, if they are in accordance with the objectives and if they are applicable in this investigation. Do the indicators used in the different models present the true picture and are they really measuring how we distinct intellectual capital?

### 2.2.3 Phase Three - The Case Study and Development/Applying of Model

This is the empirical phase of the thesis and consists of a case study of Skåne and its intellectual capital. A case study must be well adapted to its purpose and easy to generalise (Anderssen, 1998). The result can be used on similar organisations and should not be specific for the investigated organisation. In this case the intention is to facilitate the application of this study in other regions or municipalities. A broad range of material will be collected but the intention is only to analyse the parts that falls within the purpose of this thesis and the model that will be employed. The case study aims to give an understanding and to determine and interpret the indicators we choose to analyse. This is probably the primary mission of a case study (Anderssen, 1998). A case study is

characterised by depth rather than breadth, specificity rather than generalisation, relationships/processes rather than results, natural environments rather than assumed situations and a wide range of sources rather than one sole method of investigation (Denscombe, 2000). The intention is that these characteristics will permeate this thesis and the mapping of Skåne's municipalities.

A model is a simplification of reality; there are verbal, schematic and mathematic models (Widersheim-Paul, 1992). Using the grounds from phase two a quantitative model that seeks to describe and benchmark the intellectual capital of the municipalities in Skåne will be created. By using input from a multitude of sources the aim is to establish relevant indicators of intellectual capital. By evaluating a number of methods the aim is to establish best-practice of benchmarking the region. How the intellectual capital will be measured will be established in this phase. We intend to be critical towards ourselves, this investigation and the model applied to show our way is maybe not the best and certainly not the only way of mapping or describing intellectual capital. To fulfil this we have to be aware of our limitations and humble towards other methods and critic.

#### **2.2.4 Phase Four – Collecting Data and Employing the Model**

In this phase it is known which kind of information wanted to have in order to proceed with the mapping. This phase has got a quantitative approach where data and statistics are going to be collected to be employed in the developed/selected model. This does not make this phase easy – it is not known whether the data wanted is available or not. There might be adjustments of the study after the available data and the evaluation of relevance and accuracy of using the particular data. Since intellectual capital is a fairly new phenomenon we must be a search for alternative statistics in order to capture the phenomenon. The intention is to collect data and statistics from as credible and accepted sources as possible; this is the only way if we want this investigation to be reliable.

#### **2.2.5 Phase Five – Analysis and Conclusions**

This phase, the analysis and conclusions, could be the most important phase of this thesis. The model, indicators included, indicators excluded, the results, imaginary results, the accuracy of the study and a wide range of other topics that affect the outcome of the study are going to be evaluated. The discussion will be based on knowledge that we have assimilated during the thesis and will be put into context. The discussion is necessary to bring credibility and to bring in other perspectives to the results and importance of the results. This is where the thesis gets interesting – will we be able to contribute with something new to the science of intellectual capital?

### **2.3 Data and Information Collection**

Both primary and secondary data will be used in this thesis. The primary data consists of interviews and personal meetings, the secondary data will be collected from a wide range of sources.

### **2.3.1 Primary data**

The primary data consists of information collected during personal interaction. One's personal preferences can always be a source of error using primary data. Still, even personal preferences are interesting as long as they are not treated like fact. The primary data in this thesis consists of an interview with Vilmer Andersen who is a Regional Council Commissioner in Skåne for the Left Party of Sweden. Further our tutor, Leif Edvinsson, has been consulted frequently to get his input into the subject. Ideas and inspiration has also been gathered during a seminar in Malmö.

### **2.3.2 Secondary data**

The data used in the quantitative part of the study where municipalities are evaluated and benchmarked is mainly gathered from published statistics from various institutions, authorities and organisations. The secondary data consists of statistics covering the 33 municipalities in Skåne. These will be retrieved from a number of sources, amongst them SCB, Region Skåne, Skolverket (Swedish National Agency for Education), Arbetsmarknadsverket (Swedish National Labour Market Administration), Socialstyrelsen (The National Board of Health and Welfare) etcetera, all that we consider to be reliable. We aim to use only official sources with high reliability in order to secure the reliability.

### **2.3.3 Literature Search**

There are three different ways of literature search; to ask others, read journals or by use bibliographic search tools (Anderssen, 1998). In this thesis all three of them are going to be used. In the search for literature reference lists of scientific articles, published books, academic reports, masters' theses and recommendations from our tutor has been used to find relevant and useful sources that deal with selected topic. Also library resources and databases to search for relevant literature and journals such as the *Journal of Intellectual Capital* to complete the picture of intellectual capital were used.

## **2.4 Analytical Method**

To fulfil the purpose of this thesis the analysis will be made in agreement with the theoretical framework presented in chapter three and the quest for regional intelligence presented in chapter four. This will then be further analysed in the empirical research and analysis chapters.

## **2.5 Criticism of Sources**

In examinations there are always comparisons between thoughts about reality and data about reality (Widersheim-Paul, 1992), theoretical ideas versus empirical results. Criticism of sources is a kind of selection method - a lot of material collected but only the trustworthy and acceptable is kept. The point of departure in criticising sources is the authors' trustworthiness, the objectivity of the source,

the current accuracy of the source and how the source relates to other sources (Rienecker & Jørgensen, 2002).

The sources we intend to use in this thesis are both theoretical and statistical. The statistical data consists of secondary data collected from SCB, Eurostat etcetera. This is the best data accessible for people outside the municipalities and it can be considered as a reliable source. The literature used is a mixture of course literature and other publications dealing with relevant subjects. A great deal of the literature used is widely accepted, this is no guarantee for total accuracy but it minimises the risks of incorrectness. Also by using several sources that deal with the same topic we can pinpoint a consensus view of the phenomenon that we aim to describe and analyse.

### **2.5.1 Validity and Reliability**

The nature and the reality that there is no strict definition of the building stones of intellectual capital makes it hard to establish a general validity of the results in a wider point of view. The results will be best suited for comparison studies. It is very important that we identify the most important and significant factors that mirrors intellectual capital in order to reflect it in a true way. There are many definitions and ways to measure IC and the importance of critically assessing the published material is high. By studying and reading the findings of various independent academics and practitioners we aim to get a full picture and will be able to establish our view of IC. The qualitative approach makes it important to use several independent sources. Establishing the definition of intellectual capital and how it is measured in a true way is the most critical part of the research project.

When measuring and benchmarking the intellectual capital data will be collected from official published sources with a high degree of reliability. The reliability of the data will have the prerequisites to be high provided that the statistical database gives the same result. By using data from the same source when comparing different indicators the risk of using statistics that measure different things or things differently is minimised – as this could affect the reliability. If we are forced to use different sources we aim to carefully look at all the components used to calculate the statistic and investigate whether the numbers are comparable or not. This is however something that we hope to avoid.

There are many problems associated with measuring intangibles such as intellectual capital. Professor Ahmed Bounfour (2003) lists a number of areas that makes the issue problematic;

1. Availability of sufficiently reliable, comprehensive and detailed data
2. Data availability for service sectors
3. Measurement of knowledge
4. Linking inputs to outputs
5. Networking activities and organisations
6. Availability of data on intangibles
7. Evaluation of measurement results
8. Modalities of data collection

In this early phase of development and with the lack of a clear definition of intellectual capital and the factors affecting it, it is difficult to arrive at precise measurements (Bounfour, 2003). The five phase methodological approach will provide us with the major prerequisite for achieving the task.

The credibility of the study is affected by the understanding, background, and knowledge of the authors. There are three types of validity; construct validity, internal validity, and external validity. Construct validity is achieved by using correct indicators and method of measurement. The internal validity is dependent on the ability to identify at the right relationships, while external validity considers the possible extent of generalisation. To describe and map intellectual capital there are predicaments in all these validity criteria. Since statistics are built based on traditional accounting measures it could prove to be difficult to find variables that measure exactly what we aim to measure and therefore proxies will have to be used. The internal validity is also intricate since there is little research done in assessing alternative indicators and the relation and effect on intellectual capital. This will be addressed by studying theories and previous research projects to find variables that have proven to correlate with IC. To reach external validity indicators that describe and drive the intellectual capital of municipalities have to be found. The indicators available may not be the best possible indicators to describe intellectual capital but the results may however act as a pointer to municipalities who want to work continuously with the development of their IC. It should also be mentioned that there may be highly relevant data in the individual municipalities but in order to apply a benchmarking approach we will have to use data that is accessible and quality assured from all municipalities.



### 3 Theoretical Framework

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*In this chapter the theories that will give a history and present standing of concepts such as intellectual capital, IC of nations and IC of municipalities are presented to the reader. Thereafter four established models for assessing IC will be presented and finally summarised.*

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***“Intellectual capital forms the root of a corporation – and of a nation – that supplies the nourishment for future strengths and growth.”*** (ISA, 2001)

#### 3.1 Selection of Theories

The theories have been selected while going through reference directories of previously published reports and articles. Our tutor has also provided us with several proposals of theories and relevant authors. As mentioned intellectual capital is a rather novel topic and therefore the theories behind it are recent. The presented theories have been selected to give the reader a broad understanding of the topic, combined with the forefront research on intellectual capital, community development and benchmarking of regional intellectual capital. The methods that will be reviewed were chosen to represent different approaches to provide us with different methodologies for regional IC.

#### 3.2 Intellectual capital

If we are to designate the past as “the old economy” and the present and future as “the new economy” the old economy stands for material and the new economy stands for knowledge and creativity. In many ways it is much simpler to quantify digits than knowledge and creativity – we all know GDP and revenue. But as Edvinsson and Bounfour have stated the 500-year-old accounting system is focused on historical costs and transaction reporting. This backward looking metrics approach leads to growing inaccuracies in the understanding of value creation (Edvinsson & Bounfour, 2004). There is no concordant definition of intellectual capital but emerging consensus points to four major areas of IC – human capital, structural capital, relation capital and organisation capital. According to *Intellectual Capital Sweden* intellectual capital includes all factors of production, invisible on the traditional balance sheet, but decisive of a company’s long-term profitability ([www.intellectualcapital.se](http://www.intellectualcapital.se)). Intellectual capital is a contemporary topic in the business world and the content and message of intellectual capital has turned traditional accounting upside down. Intellectual capital first emerged when trying to assess the intangible difference between market value and book value of publicly listed corporations. Some corporations in the same industry were trading at much higher multiples than others, despite their seemingly identical business model. How is it possible to quantify this intangible difference in valuation? That was the query Edvinsson would try to answer when he in 1991 was appointed as the world’s first director of intellectual capital at Skandia. His work resulted in the IC Navigator (or “The Skandia Navigator”) that includes both financial and non-financial variables in order to measure performance. The IC Navigator tries to tie together and visualise the five focusing areas of intellectual capital according to Edvinsson. The model also indicates how the different areas interact with each other over time.

The user of the IC Navigator can use the tool both as a guide and an organiser. There are five different areas of focus in this model, illustrated in *figure 3.1*. The financial focus represents the past; this consists of information collected from the balance sheet. The customer focus and the process focus reflect the company today. Renewal and development focus is the company's capabilities for the future.

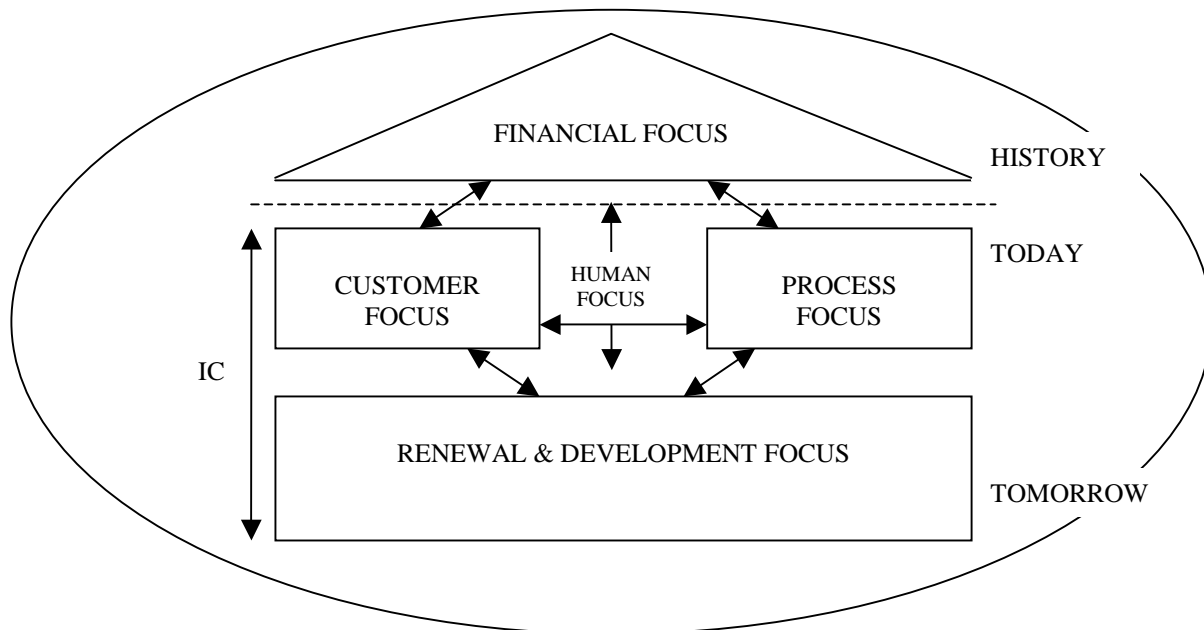


Figure 3.1: SKANDIA NAVIGATOR (Edvinsson & Malone, 1997)

The five focuses represent the areas upon an organisation should focus its attention. The *financial focus* includes old indicators like balance sheet but can also contain more newly developed measures. This focus represents the past and tells us where the company was in an exact moment in the past. Some of the indicators suggested by Edvinsson and Malone are value added per employee, market value, total assets and R&D investment. The *customer focus* embraces the customers and the relationship with customers, this focus reflects the present. The customer relationship constantly changes and needs to be updated. The present value of all customer relation is the value of a company's customers. Indicators that could be used in this focus are market share, days spent visiting customers and satisfied customer index. Also the *process focus* reflects the present. This focus deals with the role of technology as a tool for supporting overall enterprise value creation. This focus includes IT-systems, networks and general working processes. If the technology is not correctly chosen the company's processes are not effective and should be taken care of. Ways in measuring the process focus could be laptops/employee, cost for administrative error/management revenues or contracts filed without error. The future is presented as the *renewal and development focus*. This focus is the opposite from the financial focus, not just the time aspect but also as this focuses on preparing the company for upcoming opportunities and future events. Possible methods to measure renewal and development are renewal expense/consumer, share of employees under the

age of 40 and R&D resources/total resources. The *human focus* finally interacts with all the other focuses. The human focus could be measured in leadership index, employee turnover or number of female managers. The ellipse surrounding the navigator reflects the surrounding environment and the context. (Edvinsson & Malone, 1997)

Intellectual capital consists according to Edvinsson and Malone of two main segments - human capital and structural capital. In this account human capital is the ability of people in the organisation to use knowledge, skills and innovation to perform their duties. Human capital also includes the values, culture and philosophy of the organisation. The characteristic of human capital is that it cannot be owned by the organisation. Nick Bontis (2004) defines human capital as the knowledge, education and competencies of individuals to realising national tasks and goals. He pays attention to the difficulties in measuring human capital and argues the importance of both collective knowledge and individual stores of knowledge. He writes: "*the human capital of a nation is the intellectual wealth of its citizens and is developed through education and lifelong learning*" (Bontis, 2004). Josep Viedma (2001) uses three similar elements when describing intellectual capital other than human and structural capital. He adds the relational capital that is defined as the ability of the organisation to interact positively with the business environment. Ahmed Bounfour (2003) in turn draws parallels with intangibles and intellectual capital with a resource based view to explain how competitive advantages and areas of competitiveness.

Structural capital is the structure of the organisation, hardware, software, databases and thinks alike that supports the individuals in their activities including networks and relationships. The structural capital is what is left when people leave, this can be owned by the organisation (Edvinsson & Malone, 1997). Human and structural capital interacts with each other to create value in an organisation. The only way to utilise the intellectual capital within an organisation is to transform as much human capital as possible into structural capital. This leads us to the IC-multiplier developed by prof. Edvinsson (Berglund et. al, 2002).

$$IC \text{ multiplier} = \text{Structural Capital} / \text{Human Capital}$$

The structural capital should be larger than the human capital, otherwise the multiplier turns into the opposite. This would lead to an erosion of human capital (Berglund et. al, 2002). When an erosion of intellectual capital occurs the organisation has not got enough structural capital to match their human capital. A company with a low level of structural capital takes significant risks. This is because the employees can leave the company whenever they wish and the only resource left will be the structural capital.

### **3.3 Four Different Methods of Regional IC-description**

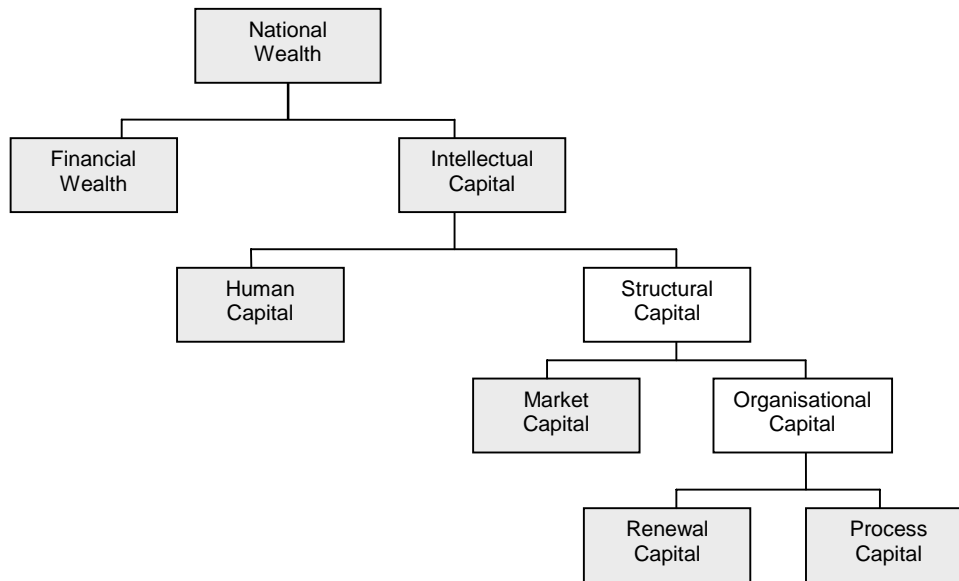
The increasing attention to intellectual capital and the proliferation of benchmarking has given rise to a number of recommendations, methods and models on how to manage, measure and evaluate the intellectual capital. The complexity and nature of intellectual capital makes it difficult to measure

and proxies have to be used when assessing the linkages between variables and the effect on the intellectual capital. The mission and purpose of this thesis is to evaluate four different methods for measuring regional IC to use one or many of them to map the intellectual capital of the municipalities in Skåne. There are a wide range of methods for measuring IC but within the space of time available for this thesis there has to be a selection when choosing a limited number of models. As mentioned these four models give a broad spectrum of IC measurement and therefore lay the foundation of the theoretical framework in this thesis. Each of the models presented has a different approach and objective and by reviewing these four models we hope to capture best practice and apply that to Skåne. The methods we will use as a foundation is presented below and reviewed and discussed in the following chapter. For a deeper insight all methods are further presented in *APPENDIX 1, 2, 3 & 4*.

### **3.3.1 National Intellectual Capital Index - NICI™**

Nick Bontis, Associate Professor of Business Policy at McMaster University in Canada, developed his model of national intellectual capital index to "*uncover and manage the invisible wealth of a country*" (Bontis, 2004). The model also includes discussions concerning the new economy and the new ways of management in the new environment and competitive landscape. His article is focused on intellectual capital of regions and he communicates that the intellectual capital of a nation includes the hidden values of individuals, enterprises, institutions, communities and regions that are the current and potential sources for wealth creation. These hidden values are the roots for nourishment and the cultivation of future well-being. Bontis analyses the intellectual capital in five principal areas and uses a modified figure from Edvinsson and Malone to describe his work (*figure 3.2*).

Bontis (2004) uses GDP to evaluate a nation's financial capital but he emphasises the importance of normalising the figures for differences in purchasing power - thereby using purchase power parity adjusted GDP figures. The process capital is defined as the nation's technological, information and communication systems as represented by its hardware, software, database, laboratories and organisational structures which sustain and externalise the output of human capital. He defines market capital as social intelligence created by elements such as laws, market institutions and social networks. The renewal capital is a nation's future intellectual wealth, where R&D is a key parameter. Bontis also includes patents and scientific publications in defining the renewal capital.



**Figure 3.2: Modification of Edvinsson and Malone (1997) (Bontis, 2003)**

Most researchers in the area of intellectual capital define the different components in intellectual capital similarly. What separates the different models is the method used to index and calculate the benchmarks of intellectual capital of corporations, regions or nations. Bontis presents his method as an index based on a conceptual framework.

He emphasises that it is important that the index is formally validated, the input depends on the nation/region examined. In order to incorporate as many countries/regions as possible the selection of indicators has to be adjusted to the information available. When measuring the Arab area four sub-indices were used; National Human Capital Index, National Process Capital Index, National Market Capital Index and National Renewal Capital Index (Bontis, 2004). There are several indicators in every sub-index and each indicator is weighted. The reasons for these weightings are that Bontis has found that some indicators are more significant drivers of intellectual capital, for instance total R&D expenditures as a percentage of GDP. If there are five different indicators in the “National Human Capital Index” these five together makes 100%. When the four sub-indices are calculated they are combined in order to calculate the overall composite *NICI*. After measuring the different areas indices are created in each area. Bontis takes the analysis one step further by investigating the inter-relationships among the indicators and formulates hypothesis about the association between the different indices and indicators as drivers. (*APPENDIX 1*)

### 3.3.2 Regional Value Creation Efficiency Analysis - VAIC™

Dr Ante Pulic, Professor of Business Organisation at the University of Zagreb in Croatia, has developed the Value Creation Efficiency Analysis, *VAIC*, which aims to measure the efficiency of the resources in corporations and regions in a financial valuation model (Pulic, 2004). He argues that on a national or macro level the GDP is equivalent of what revenue and profits are on a company level. You cannot say if the GDP of a specific country is good or bad in regards to the

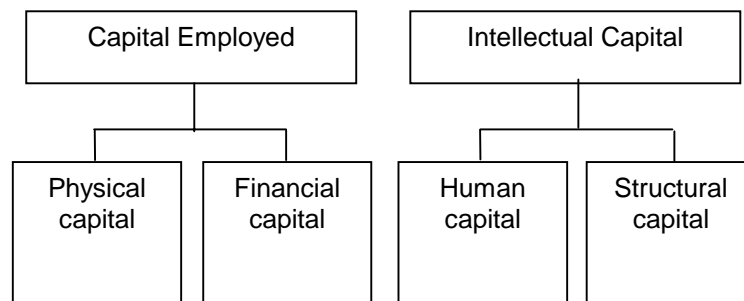
utilised resources. Furthermore the macro level is measured in one way and the micro level in another. Maybe the *Intellectual Capital Efficiency* (ICE) is the “new” GDP in a knowledge economy, he argues (Pulic, 2004). Pulic writes that his model does not only identify the size of the intellectual capital but also measure if it is used efficiently. He also remarks the importance of measuring the IC on national level as this is likely to influence the entire economy. The model results in a national average of ICE with which you can benchmark regions within a nation in order to establish where value is created and where improvements are needed. The formula for *VAIC* reads

$$VAIC^{TM} = ICE + CEE$$

This is equal to

$$VAIC^{TM} = \left[ \frac{VA}{HC} + \frac{SC}{VA} \right] + \frac{VA}{CE}$$

- Value added (VA):** Consists of newly created value  
**Human Capital (HC):** Means overall employee expenses (salaries, education, training);  
**Structural Capital (SC):** Is the result of Human Capital’s past performance  
**Capital Employed (CE):** Is all material and financial assets.

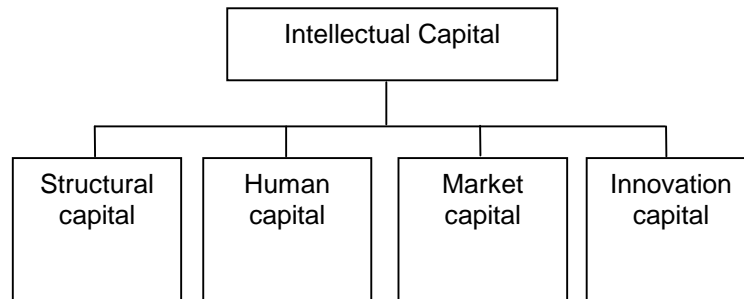


**Figure 3.3: Intellectual capital according to Pulic (Andriessen, 2004)**

*VAIC* indicates the value creation efficiency of all resources (sum of the previous indicators). It expresses the intellectual ability of a company, regional or national economy. It is said the *VAIC*-method is unique when it can be applied on all levels of business activity. All data needed for accomplish a *VAIC* analysis can be collected from a balance sheet or national statistics (Pulic, 2004). (APPENDIX 2)

### 3.3.3 Intellectual Capital Dynamic Value Approach – IC-dVAL™

Another method is developed by Ahmed Bounfour, Professor at Université Marne La Vallée in France, he divides intellectual capital into four areas; structural capital, human capital, market capital and innovation capital (*figure 3.4*).



**Figure 3.4: Intellectual capital according to Bounfour (Andriessen 2004)**

Bounfour's model to analyse is called the *Intellectual Capital Dynamic Value Approach (IC-dVAL)* which measures IC in four interrelated dimensions of competitiveness;

1. Resources as inputs
2. Processes
3. The building of intangible assets (intellectual capital)
4. Outputs

This method aims to describe the intellectual assets of a corporation and to make them as understandable to as many people as possible (Bounfour 2004). Bounfour also points out the link between financial value of assets and internal performance of companies and the importance of establishing such links. The *IC-dVAL* method is designed to address values in three perspectives of stakeholders; shareholders, clients and the internal operation.

The method is divided into five steps:

1. Determining key processes and components of value
2. Benchmarking process performance with "best in class" organisations and quantifying this using an index
3. Benchmarking activity performance with "best in class" organisations and quantifying this using an index
4. Evaluating overall corporate performance with those best in class. This is done by calculating an overall ratio
5. Calculating the overall IC value of the company

After identification of key processes and benchmarking them against best in class they are weighted to give the activity performance index:

$$\text{Weighted Processes Performance Index} = \text{Activity Performance Index}$$

Thereafter the overall performance index is calculated by weighting the activity performance index:

$$\text{Weighted Activity Performance Index} = \text{Overall Performance Index (OPi)}$$

The overall performance index represents the present performance of the company in three dimensions of competitiveness: resources, processes and outputs. This index is then multiplied with the value of the intellectual capital to get to the dynamic value of the intellectual capital. The nature of this method is that no one organisation can achieve an overall performance index that is equal to the value one, unless they are best in class in every activity (Bounfour, 2004). This value is then multiplied with the market value of the organisation in order to receive the intellectual capital dynamic value. When modified to fit nations the last step is excluded as there is no market value of a region.

The *IC-dVAL* methodology has been used both on national and municipal level to evaluate the performance of Champs-sur-Marne in France and the European Union, Japan and the USA (Bounfour, 2003). The Nordic region received top scores in Bounfour's study and appears to be those best at managing their intellectual capital according to that study (Bounfour, 2003).

#### APPENDIX 3

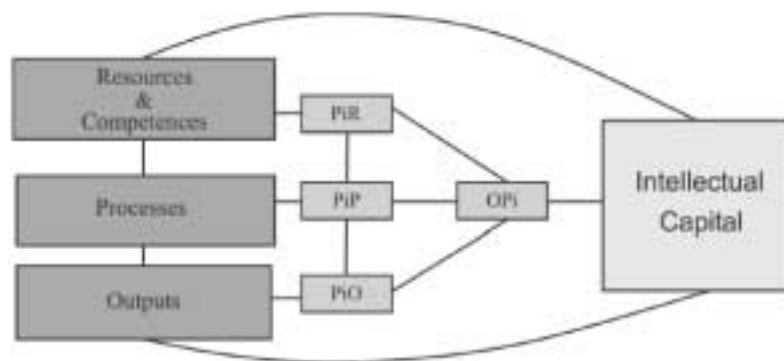


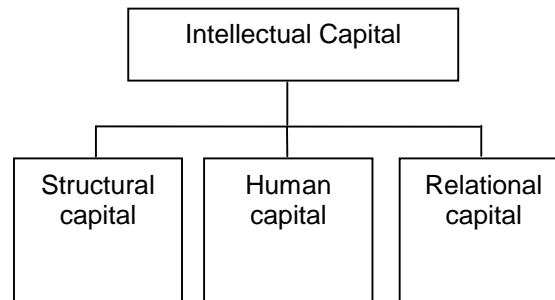
Figure 3.5: Metric model of *IC-dVAL* (Bounfour, 2003)

#### 3.3.4 Intellectual Capital Benchmarking System - ICBS™

Professor Josep Maria Viedma at Polytechnic University of Catalonia has developed the *Intellectual Capital Benchmarking System (ICBS)* method. This method has its foundation in understanding the competitive environment, the competitive gap and the knowledge of the causes of this gap (Viedma, 2001). The method is built on resource based theory and aims to benchmark core competencies of a region or an organisation with the best-in-class organisation as the point of reference. Differences and the difficulty of a perfect match are addressed by relying on comparing corresponding business units. The method results in a balance-sheet of competitiveness where the competencies are valued



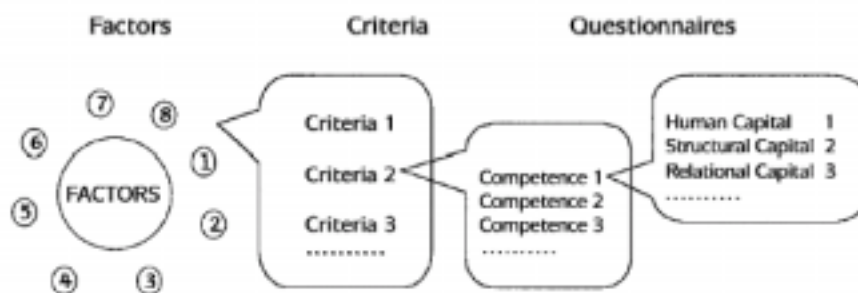
as an asset or liability depending on their score relative to the benchmark; a weighted average of the factors that are identified (Viedma, 2001).



**Figure 3.6: Intellectual capital according to Viedma (Andriessen 2004)**

The *ICBS* model was further developed to be used for measuring and managing IC of cities where the intellectual capital is scrutinised on two levels; *Cities' General Intellectual Capital Model (CGICM)* and *Cities' Specific Intellectual Capital Model (CSICM)* (Viedma, 2003). The CGICM approach measures the intellectual capital with the IC Navigator model for nations developed by Edvinsson & Malone (1997) and Bontis (2002) as starting point and results in a yardstick that can be used for general benchmarking. The CSICM approach deals with a region's specifically relevant economic activity and is based on Viedma's ICBS model (2001). The CSICM approach is much more specific and is tailor-made benchmarking for the specific city or region against the selected best-in-class city or region, whereas the CGICM approach provides a general benchmarking tool.

#### APPENDIX 4



**Figure 3.7: ICBS model framework (Viedma, 2001)**

### 3.4 Theoretical Review and Summary

A survey of intellectual capital and different ways of measuring it was presented in chapter three. There is no exact definition of intellectual capital and there are both monetary and non-monetary indicators used when trying to map it on company, national and regional level. The four models presented will be evaluated and analysed to result in an adapted model to measure the IC of Skåne

and its municipalities. How these models complete each other and how they are further used in this study will therefore be expanded on in *5.3 Our Emerging Approach of Regional IC Measuring*.

*Figure 3.8* gives an outline of the four selected models – how they describe intellectual capital, what kind of results are being drawn, if they use any kind of benchmarking, and their regional intellectual capital approach.

	<b>NICI</b> <i>Bontis</i>	<b>VAIC</b> <i>Pulic</i>	<b>IC-dVAL</b> <i>Bounfour</i>	<b>ICBS</b> <i>Viedma</i>
<b>Description of Intellectual capital</b>	Human Capital Market Capital Process Capital Renewal Capital	Human Capital Structural Capital	Resources Processes Output Assets	Human Capital Structure Capital Relation Capital
<b>Type of result</b>	Indices as drivers	Efficiency ratio Value added Capital Employed	Indices	L1: Indices L2: Asset & Liabilities balance-sheet
<b>Benchmarking</b>	Interrelationships and Against best-in-class on every individual variable	Efficiency relative to resources	Against best-in-class on every individual variable	L1: Against best-in-class on every individual variable L2: Against selected best-in-class organisation
<b>Intellectual capital</b>	Drivers of IC	Efficiency of IC	Operational capital	Competences Competitive gap Knowledge of the causes of the gap

**Figure 3.8: Regional IC Model Matrix**

## 4 The Quest for Regional Intelligence

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*In the fourth chapter the quest for intelligence among nations and municipalities will be explained and the concept of intellectual capital is put into context. Examples of implementations will be given and a distinction of intelligence will be presented.*

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### 4.1 Introduction

In governments, corporations and as well in research sectors knowledge-management has become an important part. European countries have observed and acknowledged the importance of the knowledge economy and IC measuring. The member countries of Organisation for Economic Co-operation and Development (OECD) invest in intellectual capital, such as R&D, education, patents and information communication technology (ICT) in order to improve the knowledge of the nations. Sweden is recognised as one of the countries with the highest level of investments in intangibles such as R&D, education and social infrastructure (Radovanovic, 2004; [www.kmmagazine.com](http://www.kmmagazine.com)). Knowledge is a resource that multiplies when used rather than being depleted ([www.entovation.com/forthcoming.htm](http://www.entovation.com/forthcoming.htm)) and the production of new knowledge increases on a daily basis (Jensen, 1999). In this chapter we would like to define knowledge and the quest for knowledge and intelligence in regions and municipalities.

The intention is to use a many different authors and researchers to give a broad picture of the subject. Further we will link the discussion to Skåne and the knowledge existing in this region. An important and interesting thing to mention, that will be more fully presented later in the chapter, is IDEON which is the first research village in Scandinavia and situated in Lund.

### 4.2 IC of nations

The intellectual capital was first developed for corporations but can also be used to evaluate non-commercial organisations such as cities, towns and municipalities. The developments in information and communication technology are believed by Edvinsson & Malone to possibly lead to a decentralisation of people where they are free to choose where to live and work. Today it is possible to work from home connected through broadband access and a laptop. This development has the potential to change the structure of communities and increase competition between municipalities (Edvinsson & Malone, 1997). Today there are rankings of the most intelligent and knowledge intensive cities and other rankings of cities that provide the highest quality of live for their citizens. Will people move there because of the rankings? In that case, what will be the consequences of that?

Historical empirics show that efficient use of resources, both tangible and intangible, and the ability to adapt to new environments create the difference between continued existence and extinction. City

planners also identify the possibility of cities turning into theme parks that are tailor-made to match the lifestyle of targeted populations (Edvinsson & Malone, 1997). This structural change and more focus on intellectual capital will be vital for future strategy development and management of competitive advantages. Regions have to re-evaluate and map the resources that create value, wealth and welfare for the people and focus on developing and investing in relevant variables (Edvinsson & Malone, 1997).

Richard Florida is a professor in Economic Development at Carnegie Mellon University and provides a somewhat different view on globalisation, developments and the future of communities. Florida does not believe that new technologies and new working arrangements will make people relocate outside cities or popular regions. When technologies such as the telegraph and telephone emerged there were predictions that cities would disappear. Despite new technologies concentration of both people and industries remain high (Silicon Valley, Singapore, Broadway). Florida shows in his research that community and place are more critical factors than ever before when individuals choose where to locate (Florida, 2003). There are many explanations of why concentrations evolve. Generally geographic location, linkages between firms and positive co-location benefits have been pointed out as determining factors when explaining clustering of industries. Florida believes that clusters form from a concentration of talented people who power innovation and economic growth in the region (Florida, 2003). Porter et al. likewise write location matters for innovation, and companies must broaden their approach to the management of innovation accordingly. This can be facilitated by developing and commercialising innovation in the most attractive location, taking active steps to access local strengths and proactively enhancing the environment for innovation and commercialisation in locations where they operate (Porter & Stern, 2001). Porter was the first to use the cluster concept to describe how international competitiveness is created within a group of related firms (Törnqvist, 2002). As Törnqvist writes; in recent years, it has become more common to refer to clusters within a specific geographical environment where related firms are localised and surrounded by supporting activities. The various participants – all of whom are linked together – may be subcontractors, customers, competitors, universities, authorities and other organisations. There are numerous examples of such geographical clustering such as Hollywood in relation to the film and entertainment industry, Silicon Valley within information technology, Detroit in relation to motor vehicles and the City of London regarding finance services (Törnqvist, 2002).

Florida identifies three incumbent perspectives that try to explain innovation and economic growth. The social perspective based on Robert Putnam's social capital theory shows that people have become more disconnected and are less inclined to engage in community activities - strong ties have transformed into weaker ties. Strong ties have shown to be beneficial for stability and continuity of communities and cities (Florida, 2003). The human capital/urban-regional perspective based on Jane Jacobs' research identifies people as the main force behind regional innovation and growth in contrast to the traditional view of geographic location. The third and final perspective is the creative capital perspective. Studies show a clear connection between educational level and growth where places with a greater number of talented people grow faster and are better able to attract more talent (Florida, 2003).

Florida agrees that human capital is an important factor for innovation and growth but his research has mainly focused on why the human capital cluster and locate to certain places. His research has shown that creative people - called "*the creative class*" - prefer places that are innovative, diverse and tolerant (Florida, 2003). This, he claims, will give rise to "*creative centres*" that will stand as winners with companies following the people. Florida identifies three variables "*the 3Ts*" of economic development; *technology* as in innovation and high-tech concentration, *talent* as in bachelor's degree or above and finally *tolerance* as in diversity. The variables are interdependent and all are needed to attract the creative class. Florida has introduced new indicators such as *The Bohemian Index* - the number of artist, painters and writers in a region and *The Gay Index* - the concentration of gay people to predict high-tech concentration and growth. Empirics by Robert Cushing have shown that the human and creative capital perspectives give a much better guidance of innovation and growth than the social perspective does (Florida, 2003).

Florida's message has been successfully spread over the United States of America and Canada and a number of states and cities have tried to implement Florida's theories in order to attract and retain the "*creative class*". The model has been evaluated and been translated into social policies to be adapted and developed by the community administration (Donald & Morrow, 2003). Florida's theories have however encountered a lot of critic and is questioned by a number of people, among them Joel Kotkin (Professor of public policy at Pepperdine University, USA) as published in the New York Times (Shea, 2004). Kotkin argues that workers and businesses are more interested in affordable housing than in the supply of culture and cosmopolitan environment. He also points to the fact that the top job creators in the USA last year was not ranked high in Florida's benchmarking. Harvard economist Edward Glaeser agrees with Florida that talent is important to success, at least to the extent of higher education. Glaeser identifies other factors of success instead of Florida's 3Ts; those are "*Skills, Sun and Sprawl.*" With this he argues that cities need people with the right skills, a sunny climate and a car-centred sprawl (Shea, 2004).

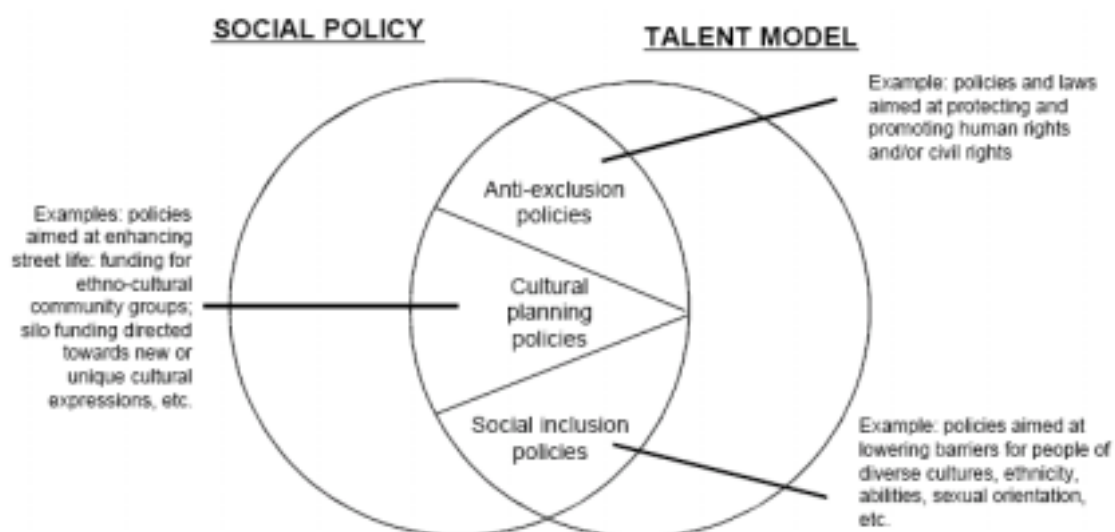


Figure 4.1: Intersection of Florida's Talent Model with Social Policy (Donald & Morrow, 2003)

Edvinsson, Malone and Florida all point to the detail that in order to measure an organisation's or region's performance and future ability to compete alternative indicators must be used. Florida calls it creative capital whereas Edvinsson and Malone call it intellectual capital (Florida 2003, Edvinsson & Malone, 1997). Intellectual capital is a much broader definition and the creative capital is in many ways captured within the human capital classification. Although intellectual capital is gradually playing a more important role, GDP still is the incumbent measure of economic development of nations and regions. As Pulic stated on the 6<sup>th</sup> World Congress on IC, GDP has a number of flaws; First, GDP is a measure similar to revenue where you get no information with regards to utilised resources. Second, GDP is used on a macro level whereas other measures are used on micro level, although together creating the economic environment (Pulic, 2003).

Sweden was the first nation that made an attempt to measure the IC of the nation ([www.entovation.com](http://www.entovation.com)). In 1996 Caroline Stenfeldt in collaboration with Edvinsson used the *IC Navigator* as the model when they developed the navigator to correspond with nations. The Invest in Sweden Agency (ISA) followed in 1999 using the same model. Israel also followed in 1999 with Dr Edna Pasher's mapping of the IC in the nation with the *IC Navigator* as basic concept. Other countries as Denmark and Netherlands were also relatively early in adopting IC mapping and today many countries have followed. (Radovanovic, 2004)

The new EU countries, with Poland in the front know how to work their intellectual capital to become competitive. There are schools gathering the "future of Poland" in form of the most intelligent kids from all over the country to give them the best education possible (SVT 2). Further EU has allocated about 30 billion euros for structural developments in Poland from their entry into the European Union to 2005 (Edvinsson, 2004). Sweden and especially Skåne with the close proximity has every chance to use this external structural capital to gain advantages. Other countries that have become aware of the importance of intellectual capital are many Asian countries. They send their students abroad to England and USA to get a good college education and bring it back to their home country for them to use the human capital and thereby gain advantages.

Sweden has on national level created organisations to promote innovation and growth by adopting the intellectual capital approach on a nationwide basis. The Swedish government has given VINNOVA the task of "*facilitating sustainable growth by developing efficient innovation systems and finance solutions to needed research*" ([www.vinnova.se](http://www.vinnova.se)). NUTEK (The Swedish Business Development Agency) is another government funded organisation that aims to facilitate innovation, entrepreneurship and business development ([www.nutek.se](http://www.nutek.se)). These organisations as well as ISA (Invest in Sweden Agency) have adopted alternative evaluation approaches to measure and evaluate the business environment and competitive advantages of regions - the intellectual capital.

### **4.3 IC of municipalities**

Svenska Kommunförbundet (The association for Swedish municipalities) has adopted *Kommunkompassen* that offers an approach to measure and evaluate alternative dimensions of

performance (www.lf.svekom.se). The model was developed by an international expert group in 1993 and been modified to fit Nordic settings by Oslo University, Åbo Akademi and Kommunenes Sentralforbund i Norge (the Norwegian association for municipalities). Svenska Kommunförbundet has evaluated the model during 2002-2003 and recommends the use of it to describe the strengths and weaknesses of a municipality. The model is based around the interaction between four main areas; the political system, services provided, the municipality as an employer and the local community (www.lf.svekom.se). *Kommunkompassen* evaluates the municipality in eight dimensions;

- Public and democratic control
- Availability and citizen/user orientation
- Transparency in the interaction between politicians and civil servants
- Management, decentralisation and delegation
- Control and reporting
- Employee management
- Development of operations
- Municipality's role as community developer

These are evaluated by a number of variables (*APPENDIX 5*). So far fifteen municipalities all over Sweden have been evaluated according to *Kommunkompassen*. None of these municipalities belongs to Skåne.

An interesting municipality to observe is Larvik in Norway - they were the very first to prototype new types of annual reports and applying IC-rating models for its activities (www.larvik.kommune.no). Aside from the traditional economic measures they present not only human capital, structural capital but also nature and environmental capital, culture capital and relationship capital. As an example they present in their first quarter report 2004 a variant of balanced scorecard for both structural capital and human capital. In the human capital aspect they present goal types as “follow-up collaborators” and “improvement proposal”, there are goal contents to describe each measure. They show how to calculate each goal measure and then present a goal as a percentage and how to fulfil the goal (www.larvik.kommune.no). In 2002 they also evaluated the municipality by a methodology called IC Rating – a benchmarking approach. This indicated that the municipality was using their internal resources efficiently and the potential for improvement was mainly found in insourcing the external resources. (*APPENDIX 6*)

#### **4.4 The Knowledge Zone**

As dealt with in previous chapters, measuring success using digits and numbers appear old-fashioned in the new society. Numerous researchers and consultants agree that innovation is the state to strive for and the area to control. An expression used to describe regions with a high density of knowledge and innovation is “knowledge zone”. Amidon writes "*A Knowledge Zone is a geographic region, product/service/industry segment or community of practice (e.g. with topical areas of interest) in which knowledge flows from the point of origin to the point of need or*

*opportunity*" ([www.entovation.com/whatsnew/praxis.htm](http://www.entovation.com/whatsnew/praxis.htm)). This could equally be a description of IDEON in Lund. IDEON Science Park was first opened in 1983 as the first science park in Scandinavia. The purpose of the park is to take advantage of the knowledge and wealth of ideas within the University of Lund ([www.ideon.se](http://www.ideon.se)). IDEON is a place for meetings and a place of exchanging ideas, establish connections and getting the opportunity to make use of structural capital available, such as digital networks and professional receptionists, to facilitate the development of a business concept. It is a good example of what could be created by a close collaboration between the university and the business sector (Törnqvist, 2002). This could be defined a creative milieu, a favourable environment for innovation according to Professor Gunnar Törnqvist (2003) (Radovanovic, 2004). Törnqvist (2002) draws a conclusion and suggests that the production of knowledge in modern society have three characteristics;

1. the sites for creating knowledge has increased – there are not only interaction between university and collages but also non-university institutes, research centres, government agencies et cetera
2. different sites linking together in new ways – electronically, organisationally, socially et cetera through functional communication networks
3. the differentiation of fields and areas leads to finer and finer specialities and forms new knowledge

The essence in creating knowledge and intelligence is that knowledge must be spread, used and encouraged. The constantly developing information technology facilitates co-operation and reduces the importance of face to face contacts. This does not make the real life interaction between people less important. Törnqvist (2002) emphasises the importance of a creative meeting environment to heighten the creativity and innovation spirit.

#### **4.5 Intelligent Creative Municipality**

Intelligence and creativeness are both things that encourage and drive innovation, which in turn drives growth. What are the factors that make a municipality intelligent and is it important with intelligent and creative municipalities? Things like universities, research centres, infrastructure and a good business climate gives a municipality competitive advantages. Municipalities are extremely dependent on variables in their surroundings that they cannot affect - such as discontinuation of important employers, developments in neighbouring areas, changes in laws and expansion of trade-zones. In the old days municipalities' most important concerns were strictly local and internal. Today they have to take the global environment in consideration – which means new values and life styles. The municipalities are exposed to decisions made by the government and they would be better equipped to encounter the future if they had a better view of the surrounding world (Jerkert, 2001). In 2001 journalist Björn Jerkert wrote a booklet at the request of the Swedish Association of Local Authorities. The aim was to provoke the municipalities' interest in knowledge and how contemporary social and environmental studies could improve their planning processes. The conclusions were that all municipalities that were investigated assert that they had a global view but



no one had an organised way of evaluating it. The intelligence, in the form of awareness of its surroundings, of these municipalities investigated is seldomly organised and they all define it in different ways (Jerkert, 2001). On city level Radovanovic addressed this prototyping quest on Lund, based on comparison with Ragusa, and with coaching from professors Edvinsson and Dedijer, when she tried to establish what factors that make a city intelligent (Radovanovic, 2004).

The general method to measure the intelligence of a region is to measure the intelligence. There is however two approaches that can be adopted; measure the intelligence or measure the ignorance of a region. The latter has been performed in Germany by North & Kares in collaboration with professor Edvinsson, where they define ignorance as the “*lack of knowledge, education or information about something and the unawareness of certain circumstances*” and results in “*The Ignorance Meter*”. The aim is to uncover enablers and disablers for intelligent regions using 10 pairs of criteria listed below. (APPENDIX 8) (North & Kares, 2004). North & Kares uses autism, blindness, and vanity among other indicators to describe and measure the ignorance of a region.

#### **4.5.1 The Importance of Networks**

Networks play an ever increasing role in creating competitive advantages and to develop communities. Networks have been defined as “*a set of nodes linked by a set of social relationships*” and alliances as “*voluntary arrangements between firms involving exchange, sharing, or co-development of products, technologies, or services*” (Cooper, 2002). The majority of the municipalities in Skåne have built international networks with “*friend municipalities*” (Skåne – Fakta om Skåne, 2002). Malmö has developed a number of important international relationships with other cities that have faced a similar situation, transforming from an industrial city to a knowledge city, in order to learn from previous experiences (Reepalu, 2004). There is an established Nordic network that meets every two years to discuss future goals and to have an exchange of experiences ([www.lund.se](http://www.lund.se)). The traditional exchange between cities and municipalities internationally has changed and is nowadays often formed in project based partnerships with clearly defined areas of exchange and cooperation. More focus has also been put on stimulating the business environment and trade within the network ([www.lund.se](http://www.lund.se)).

It is not only international networks that play an important role but also the relations with municipalities and cities in the very proximity. In order to be competitive globally all the various resources must be co-ordinated and used in an efficient manner. The municipalities in Skåne are part of a network that meets to discuss future development and problems that might arise in the different areas. This is also a platform for co-operation and the municipalities’ chance to bring forward important issues on the agenda (Andersen, 2004).

To conclude; intelligence is the ability to evaluate external factors that affect the organisation, the ability to attract and retain the right people, the ability to use resources it has and adapt to new circumstances and situations, the ability to create and maintain networks and co-operations with

other regions – both locally and globally, and the ability to translate this knowledge into management policies that develop the organisation.

## 5 Empirical Research & Model Analysis

*In the fifth chapter the empirical research method will be furthered explained. That is, what we are trying to describe, with which indicators we will describe it and most importantly a motivation why we chose the selected method and indicators. Reviewed models will be assessed and the final model will be applied and the results presented. This chapter will also contain some analysis since it is impossible to separate critical review from analysis at some point.*

***“It is not possible to measure social phenomena with anything close to scientific accuracy”***

(www.sveiby.com)

### 5.1 Introduction

In the methodology chapter it was briefly explained how we intended to go through with our investigation and benchmarking of Skåne’s 33 municipalities. In this chapter it will be a further clarification of the model that will be applied in the empirical research. In order to do so the models presented in the theoretical framework chapter must be critically reviewed r. Then there will be an evaluation whether to use a modified version or to design a model. This chapter will therefore contain model review, empirics, model making, and the final benchmarking. The aim is to make it easy to use this model on regional and municipal level for follow-up studies. This chapter is opened with a description of Skåne, continue with the review of the presented models, present the final model to be applied and finally present the results of the application. The figure below shows the chronology and layout of the chapter.

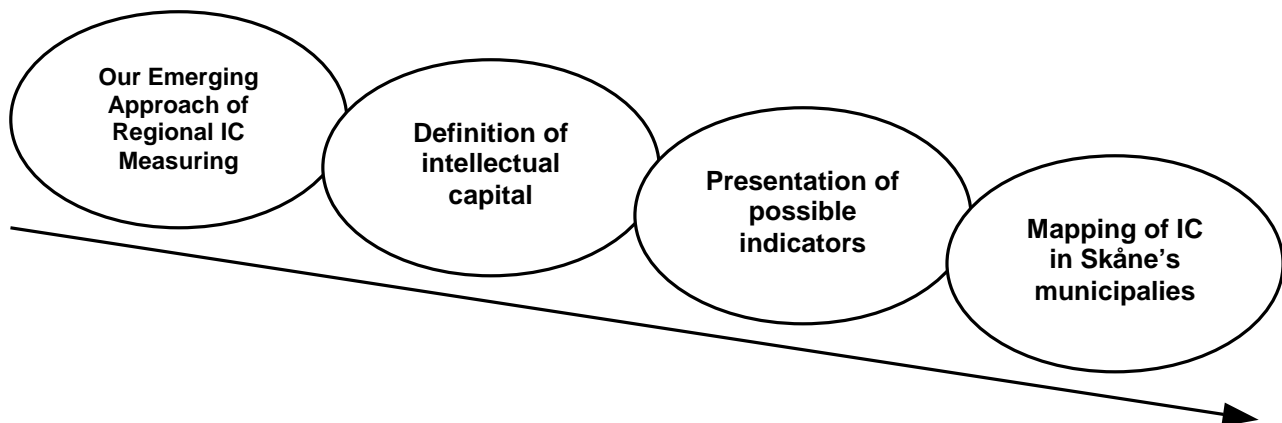


Figure 5.1: Chronology in Chapter Five

### 5.2 The Region of Skåne

Skåne is located in the very south of Sweden and consists of 33 municipalities with a total of 1.1 million inhabitants (www.skane.se). Skåne is a relatively densely populated region with a close proximity to large markets and resources in Denmark, Germany and Poland. The region has historically had a good supply of human capital with Lund University inaugurated in year 1666. The history of learning does however go back to the Middle Ages when there was a monastery school in

Lund ([www.lu.se](http://www.lu.se)). Today there are 65 000 students in Skåne's four institutions for higher education, ten hospitals and roughly 52 000 businesses in the region (Fakta om Skåne, 2002). The geographic location makes Skåne a "transit region" with extensive through traffic. The number of commuters is high and public transport plays and has played an important role to the regional integration (Skånsk Livskraft, 2004). Öresundsbron, the bridge connecting Malmö with Copenhagen in Denmark, was opened in June 2000 and has facilitated the co-operation and integration between the two countries. The number of Danish people moving to Skåne keeps on increasing, since the year 2000 over 9 000 Danes domiciled in Skåne. There are as well many people living in Skåne who work in Denmark. Skåne is a diverse region with roughly 14 % of the population born in foreign countries, however the integration is not very successful and unemployment is very high in this group of people (Skånsk Livskraft, 2004). The population has been growing the last ten years and more than half of the municipalities experience housing shortages. The trade and industry has had a beneficial development since the end of the nineties with strong clusters within the pharmaceuticals industry, medical technology, biotechnology and foods as a result. Despite significant growth the absolute number employed people in 2004 is lower than in 1990. Increasing costs and decreasing income from taxation has resulted in budget deficits in the region and in the majority of municipalities. (Skånsk Livskraft, 2004)

In 1999 Region Skåne (Central administration of Skåne) took the first decision to execute a program designated to develop the region that aims to increase growth, attraction, autonomy, and balance (Skånsk Livskraft, 2004). To evaluate the performance of the program the administration has chosen twelve indicators;

1. Change in Gross Regional Product
2. Employment level
3. Level of education and learning
4. Migration patterns in certain groups
5. Business environment
6. Visitors in recreation areas
7. Change in climate, acidification, quality of air, top dressing
8. Health
9. Security
10. Supply of employment, education and services
11. Equality
12. Diversity of ethnic background

The central administration has also identified areas of responsibilities where different organisations, institutions, municipalities and government are proposed to take responsibility and lead the development. The development program is evaluated every year with the publication of a booklet describing the development with regards to the growth, attraction, autonomy and balance criteria. According to Vilmer Andersen (Regional Council Commissioner, Left Party of Sweden) the problem with this developing program is that there is no executive function and no coordinator. It is not clear who is responsible for each one of the twelve different indicators. In an editorial published in *Sydsvenska Dagbladet* (2004) Anderson et al wrote that it is their absolute conviction that a good

regional development is created when a number of people working in the same direction with shared visions and goals. This is the intention with the development program. Andersson also identified that the interest among the municipalities in questions of growth and development are high and political issues are often put aside in order to improve the performance. However, the lack of central power makes it difficult for the central administration to tell municipalities what to do and can only recommend them what they believe would benefit the municipality and region. After that it is up to the municipality to implement or change the practice to fit the overall region. The central administration is currently working on an execution program to put the development program and vision into practice.

### 5.2.1 Review of Skåne’s Develop Program versus the IC Navigator

To investigate whether the current indicators presented by *Skånsk Livskraft* fully covers the intellectual capital conception the indicators are categorised according to the IC Navigator (figure 5.2).

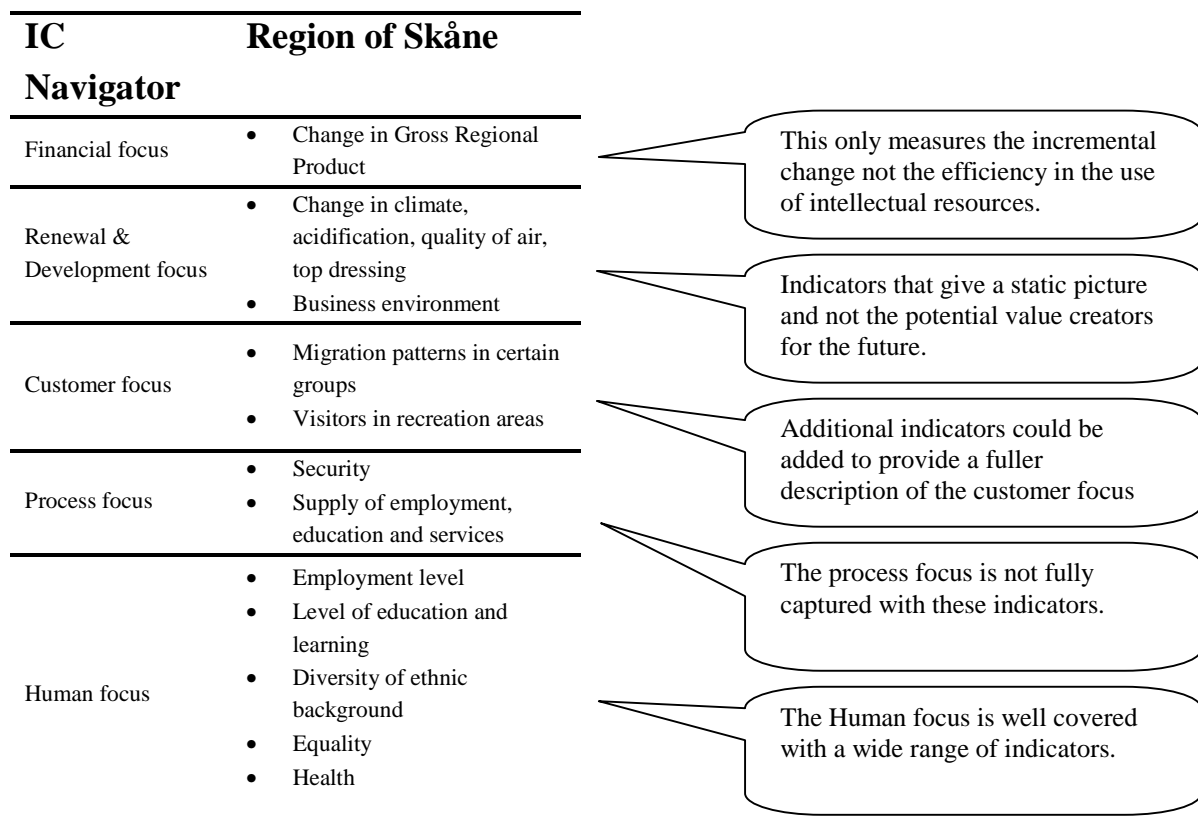


Figure 5.2: IC Navigator VS Skånsk Livskraft

The development program aims to develop the region and to make it more competitive in the future. The criteria growth, attraction, autonomy and balance do form important aspects to be competitive in the future, but they are difficult to interpret in terms of impact. The indicators today report absolute numbers of output and outcome but disregard the more important impact aspect. By not dividing the indicators into human capital and structural capital it is difficult to establish where the

weaknesses in the municipalities and region are. Today it is possible to for instance establish that the attraction is low in the area, but is it the human capital or the structural capital that needs to be improved? The current development program and the indicators to measure the progress do give better guidance than without the information, but it could be completed with additional indicators and separated in other ways to highlight shortcomings and virtues.

### **5.3 Our Emerging Approach of Regional IC Measuring**

When choosing which model preferred to continue working with, a number of factors have to be taken into account. We must really know what it is we are trying to measure - that is our distinction of IC. We also need to establish which methodology that would be the most describing and accurate to use on a municipal level. Finally the supply of statistics and indicators are central in order to apply the final model. Further in this chapter we establish a definition of IC after studying several reports, books and models.

As presented in the theory chapter there are many ways to measure IC and there are several distinctions of IC. There is no “right” or “wrong” never the less they are all different from each other and try to measure IC from different angles. Many methods use indices as a part of the model to benchmark corporations, cities or nations against each other to see which one that is more intelligent than the others. The benchmark methodology is used by Bontis, Viedma and Bounfour. Nick Bontis uses the phrase “relative to highest value” in his index; this is some sort of best-in-class measure that has advantages as well as disadvantages. If we were to apply this methodology to our implementation area, would it be possible to extract which municipality that has the highest value in every single indicator and is it always accurate to benchmark all other municipalities against the best one? The question is if it is of interest to benchmark for example the suburban municipality Staffanstorps number of tertiary students per capita relative to its neighbouring university municipality Lund? Lund University has got about 35 000 students ([www.scb.se](http://www.scb.se)) which makes it the third largest university in Sweden; how could Staffanstorps possibly measure up against that? Would it perhaps be more significant to recognise which one of the two municipalities that uses its human capital, relative to their inherent resources, in the most efficient way? This could be used in a benchmarking method by measuring the performance of every single municipality in relation to the resources used. Another way to get around the problem is to include several indicators that represent different things so that the aggregated results will provide the full picture of the situation. Although the aggregated results would provide the overall picture the individual indicators would provide a detailed map of the resources and where they are located geographically.

Another important aspect with a benchmarking approach is that intellectual capital incorporates many different things that cannot be added together unless they are converted into the same "currency". If the study is to be updated, for example every quarter, there would be a field of applications for this kind of benchmarking model. Every third month the municipalities get to know if they have improved in utilising their assets, both tangible and intangible. They can also compare with other municipalities to see if they have had better growth or improvement during the measured

time-period. This could act as an incentive to work harder with the intellectual capital to improve the attractiveness and competitiveness in the long run. But the question is if it is possible to benchmark without first comparing to the best-in-class organisation? This means first designing an index in every single indicator, by indexing you create some sort of best-in-class indicator where the best one receives the score 100 and the others are compared relative to that.

Bontis takes this one step further and gives every indicator a weighting. This makes it possible to add both “significant” and “not so significant” indicators. The advantages of weighting could be that it makes it possible to give a fuller and more detailed picture of the region or municipality being analysed as many indicators could be included. The main disadvantage is that the decision to apply a certain weighting is rather subjective and the actual weighting could give the investigator too much impact on the outcome – the personal opinion of what is important and not could more easily influence the results. But if weighting is applied – does every indicator have to be as important as the next one? How is it possible to give every single indicator a specific weighting in a fair way? In order to apply weighting to the indicators there need to be research done to establish how important the various indicators are and how they affect the competitiveness, growth and prosperity. Since IC and the indicators used to measure IC are relatively new there is little, if any, research done to establish what indicators that are better than others to describe the intellectual capital. There are many sources of error and this would further increase the complexity of a model and also question the validity and reliability of the results. More research is needed before a weighting could be applied on a municipal level. On the other hand – if no active weighting is used every indicator automatically gets the same weighting. Bounfour as Bontis benchmarks the individual variables against each other in order to describe the internal processes that improve the value of the organisation - the organisational capital. This approach is yet only used on a national level and would have to be modified to fit smaller regions such as municipalities. Bounfour’s method results in a number of indices, both on aggregate and more specific level which would provide the municipalities information on where they need to dedicate resources to improve their score. This model is similar to Bontis’ approach when it comes to the calculations and presentation of the results but has more focus on the internal processes and resources of the organisation.

Viedma analyses the intellectual capital of regions on two levels. The first level is very similar to Edvinsson’s IC Navigator and provides with a general benchmarking number with which it is easy to rank regions. When taken to the next level Viedma uses a “balance sheet” approach where the IC is measured against a selected best-in-class organisation and then specifically benchmarked on individual variables to create a balance sheet of competencies. This approach identifies the competencies of an organisation relative to the selected yardstick. The difficulty in applying this methodology to our study is the issue with selecting the best-in-class municipality. Since there is no previous benchmarking and evaluation of the intellectual capital in Skåne we cannot use this method in full. When deciding which organisation to use in the evaluation using this approach you first have to decide on what grounds to select the best-in-class organisation, which we feel cannot be done before a profound analysis of the region is completed. This would not provide a map of the region but more an indication of where the municipality stand relative to the best-in-class

municipality. Viedma is one of the first to use the concept of core competencies as a unit of analysis for intellectual capital. Andriessen has identified the dependence on the judgement of an assessor in the method and weighting of the various factors as a weak point as it strongly affects the outcome (Andriessen 2004). The subjective weighting of the individual indicators are the great weakness of Bontis, Viedma and Bounfour's models. There is no clear motivation why certain indicators get a higher weighting ratio and the results will of course be influenced accordingly.

Ante Pulic also tries to take his VAIC model this one step further and both benchmark and measure the efficiency relative to resources. This is one way to get around the "Staffanstorp versus Lund" predicament. Pulic takes all his numbers from ordinary balance sheets and national statistics and builds his method on a value-added reasoning. He does not take any "soft" values into account; things that would be able to measure quality of life such as literacy rate or penetration of internet access. These are factors that make this method and other methods difficult to fully compare. What Pulic contributes with is a way of measuring the efficiency of organisations that would provide interesting additional information in the performance benchmarking of municipalities.

Many of the experts mentioned as well as journalists has pointed out the inaccuracy in measuring welfare in GDP, still there are measures in IC models that refer to GDP. The GDP measure was never intended to be used as a welfare-measure as it is today and different sorts of IC models are an important and informative complement (Björklund, 2004). GDP does not take into account things like poverty, class distinction, environmental pollution or health. Many models emphasise GDP per capita but this is very difficult to get this number on a municipal level. Further we would like to incorporate indicators that include education, health, entrepreneurship, and standard of living.

Richard Florida, who is from a different discipline, contributes with an approach that incorporates the intellectual capital concept when describing the factors of attraction in the three Ts; *technology*, *talent* and *tolerance*. He has not developed a model to describe or measure intellectual capital but rather what attracts creative and intelligent people to certain places. Although there are people that find Florida's theories to be irrelevant he contributes with a view that fit within the intellectual capital concept and thus gives input in a different dimension. This can be utilised in order to develop and add indicators to incumbent models in IC benchmarking. As intellectual capital benchmarking aims to describe the present and future standing of regions, factors of attracting the right people would provide an important additive to improve the models. The *talent* indicator would fit in the human capital perspective, *technology* in the process capital and *tolerance* in the relational capital. By incorporating Florida's research and adding indicators of technology, talent and tolerance the results would not only measure the intellectual capital but also link the result to community development.

The most interesting angle about IC could be to measure the efficiency and renewal of a corporation, nation or municipality (Edvinsson & Malone 1997). The most efficient municipality is the one using its structural resources and link it to its human capital in the best way. Efficiency also measures how well the municipality is managed relative to other areas. This information could



provide with a best-in-class practice that would help administrations of other municipalities to develop their operations to become more efficient. There are methods and models concentrating on the efficiency measuring such as Pulic's VAIC. Some of the problems with mapping IC are that the links between financial value and improved wealth are not established and much research is needed to get a better picture of it.

In the next part of this thesis we will present our distinction of IC used in this thesis. We will also explain how we are going to apply the model and how to adapt it to the municipal level and incorporate indicators that we find further improve the results. Then we are going to elucidate which indicators we have chosen and why and also present the indicators we would have like to include.

#### **5.4 Our Distinction of Intellectual Capital**

As presented in the theory chapter all theorists have a slightly different definition of intellectual capital, although not significantly different the differences need to be addressed. The general definition of human capital as the human input and the structural capital as the support to increase the leverage of the human capital is generally accepted. Many of the theorists incorporate the same components in the IC concept but differ in where they put them in relation to each other. Edvinsson uses the conception of intellectual capital with the IC value scheme (*figure 3.1*) where intellectual capital is divided into structural capital and human capital, and where they in turn are split into sub-classes. Bounfour adds two other types of capital other than human and structural capital on the same level; market and innovation capital (*figure 3.4*). Viedma uses three types of capital; structural, human and relational capital (*figure 3.6*). Pulic uses a somewhat different approach in his model and incorporates physical assets as well, but his definition of intellectual capital is human and structural capital.

We have chosen to divide intellectual capital into two main segments; human and structural capital. The human capital is what the inhabitants of the community contribute with and the structural capital is what supports and leverages the human capital to get a multiplier effect. The structural capital will be divided into two areas; relation capital and organisation capital. The relation capital is structural capital that facilitates relation and communication building with other areas. It also incorporates the use of external structural capital. The organisational capital is the processes, structures and services that are integrated in the municipality's structure. That includes fixed structural capital such as the efficiency of the administration, media supply, business environment, and communication technology penetration. These factors also increase the potential outcome and impact factors of the existing human capital. By choosing to categorise IC in this way we believe that we capture the concept of IC in the two main cornerstones and at the same time keep the study on a level that is not too detailed or too simple.

Performance can be measured on three levels – output, outcome and impact. Output and outcome is relatively easy to measure since they have their ground in traditional accounting methods, whereas

impact is a much more difficult phenomenon to capture. Output is easy to achieve - it is all about having enough input in terms of financial and human capital resources. For example: To increase number of students you can allocate more financial resources to universities and to give subsidies to students - output of students would increase. Outcome is a little more difficult - if the student gets a job in the region and uses the additional knowledge outcome is achieved. But the most important of them all - impact - is difficult to measure. What is the impact of the output and outcome? Increased tax-income, increased attraction of other people, increased spending, incentives for other people to start studying, improved health? Impact is a dynamic phenomenon where the multiplier effects arise. If the municipality manage to leverage the existing human capital the impact of the output and outcome is high and welfare and sustainable wealth for its citizens will follow.

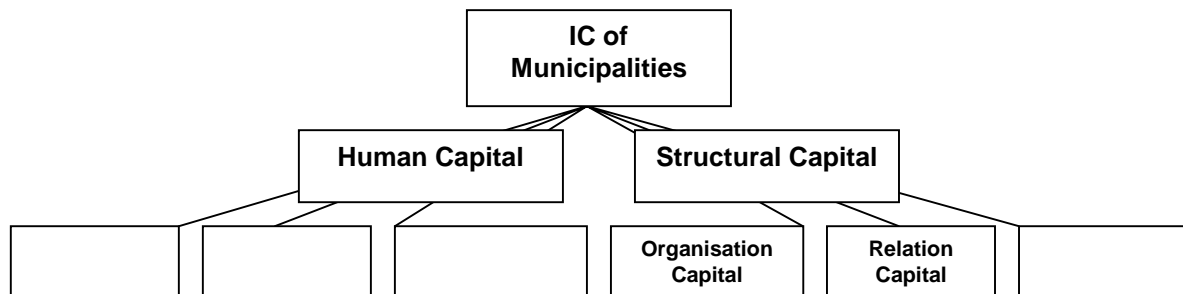
### **5.5 Model applied - Municipality IC Benchmarking**

The model that will be applied is very similar to Bontis' and Bounfour's approach with regards to calculating indices of the indicators. First, the indicators will be categorised and placed in the two dimensions; human and structural capital (*figure 5.3*). The indicators will then be indexed with the best-in-class municipality receiving the maximum score of 100 and the other municipalities will receive a score that is relative to the best-in-class score, this is similar to Bontis, Bounfour and Viedma's models presented in the theory chapter.

An example: The level of education is 50 % in best-in-class *Lomma* and the level in *Hässleholm* is 25 % would give Lomma the score 100 and Hässleholm the score 50. All indicators will be equally weighted. This will provide a ranking of the municipalities in the specific indicator. The multiple indicators will then be totalled in each category to provide an aggregated index-value in the two dimensions. This approach will make the model rather simple to use and to understand which is important.

When measuring IC of municipalities it is not possible to use the same variables as when measuring IC of corporations or nations. The main reasons for this are that the indicators available on national level are possibly not accessible on lower level and that the drivers of IC on municipal level could be different to those in corporations and nations. The first step in re-designing a model to measure IC is to examine what indicators those are interesting and relevant. We approached this by brainstorming all things about IC that we found important and wanted to include to make our mapping complete, relevant and accurate. Structural capital is divided into relation and organisation capital. This is a generally accepted classification and used in the majority of theories. It would be possible to divide human and structural capital into a great number of sub-classes to refine the study further but there is no purpose in making the study more complicated than necessary at this level. Also it will be easy to expand the study with further indicators after it is complete to make it more refined. Then the selected indicators were arranged to the relevant sub-class. The method is so far quite similar to Nick Bontis' and Ahmed Bounfour's with influences from Richard Florida. The second step is to investigate whether these indicators are possible to collect on a municipal level. We want the results to be as credible as possible and therefore the numbers used in each indicator

must be collected from the same source. “In order to incorporate as many countries/regions as possible the selection of measurements has to be adjusted for the information available”, as Bontis stated. Our aim is however to include all municipalities and if the information is inadequate we will try to find other indicators that can be used as proxy in its place.



**Figure 5.3: IC of Municipalities**

We want to complement currently used model with indicators that can describe the impact of investments, human and structural capital. As previously stated the indicators today focus on output and outcome and disregards the actual impact of them. We will try to achieve this by calculating measures to establish how effectively the resources are administrated to achieve efficiently. For instance, by dividing the human capital with the structural capital a measure of the efficiency of the structural capital can be derived. We will further analyse and discuss the individual indicators to see if we can draw other conclusions regarding the impact of the location of structural capital and human capital.

The model we will apply could have been further refined with weighting of indicators, like Bontis suggests. The advantage of using weighting is that different kinds of indicators can be used. All indicators do not need to be equal in relevance as the weighting corrects that. The problem with weighting is that research is needed to establish importance of indicators. This research must be highly valid and reliable which is a quite complicated procedure. Some find that the number of hosted meetings to be highly important and another finds equality or integration more important. But on the other hand not using any weighting is not the same as ignoring the weighting. By not giving the indicators individual weightings we are automatically giving them the exact same weighting. In extension this means all indicators used are identical in importance and relevance, at least in this study, which may not be correct. A weakness is the weighting of the activities and processes, which is a subjective decision. Although the weighting makes it easier to tailor-made the model to suit different industries or geographic locations, it also makes the outcome possibly biased. The primary task of executing this model is to identify the organisational variables that affect the intellectual capital. Bounfour's work has not established variables that have an effect on the intellectual capital, but has rather used previous research to establish the main areas of intangibles and thereafter analysing the value drivers of each area.

## 5.6 Presentation of Indicators

Below all the indicators that we find would improve the description of regional intellectual capital when measuring the IC of municipalities are presented. There will be a short motivation and explanation of why this particular indicator is important and what that indicator would add to this investigation. In this part it is almost impossible to leave some sort of analysis out. In the end of this chapter there is a description of the model and a specification of the indicators finally used.

Indicators like literacy rate is very interesting and has been used in previous studies but is certainly more relevant in a less developed region than Skåne as the literacy rate most probably is high in the region. Below both indicators that are going to be used in the model and also indicators that are preferred, but are currently unavailable. This model, as many others, has its foundation in the Skandia Navigator (IC Navigator). To evaluate whether our model captures all relevant dimensions the indicators will be categorised in the navigator perspective, as previously done with the indicators used in Region Skåne. This will give an indication how well we capture the IC phenomenon. This functions as a check-point to certify that all aspects of the generally accepted IC definition are captured with the listed indicators.

### 5.6.1 Human Capital

**Higher education (university level):** This indicator highlights the knowledge capital and the potential of the municipality. Knowledge is an important prerequisite both in order to attract businesses and to attract other people with a high level of education. One of the drivers of intellectual capital is human capital that is the foundation of IC. This indicator measures the output – the number of people with a higher education. In order to transform this output to outcome the people with higher education need to get employed and use their knowledge.

**Share employed in high-tech occupations:** This indicator is included to measure the outcome of the knowledge in the region. If a region has a large proportion of the population in high-tech occupations that would indicate that the resources are used. This indicator completes the measure of higher education. The high-tech and R&D intensive sectors are working with the future; this is the spearhead of business revolution and where the work will be in the future. If the outcome of high-tech research is high the society/municipality will presumably perform well. The problem with this indicator is to decide what high-tech is and what it is not? There is available information on number of employees in specific occupation, but this will not be an indicator good enough.

**Age structure:** the seniority of a society is of high interest. If a society does not grow the conclusion is that there will be a predominance of retired people – they still got their human capital but it is not used. There has to be an injection of fresh human capital to get an efficient usage of the structural capital. In order for the community to stay in balance and long-term viable the proportions between the generations need to be correspondent. This indicator would also provide important information regarding which generation the municipality should try to attract to the region in order to stay viable. This indicator is complicated to quantify and will therefore be excluded from the

quantitative model, still the age structure is interesting and will be discussed further in the analysis chapter.

**Share of people that are early retired:** This is a sort of indicator that measures the disability to capitalise on the human capital in the area. If a municipality has a high level of people that are retired early this means that the people working will have to support more people. It also means that there is a brain power reserve that is not utilised and does not contribute to the development of the community. This is a human capital indicator which also has got an influence in quality of life. If the inhabitants are healthy the society is healthy and the resources could be invested in other areas.

**Health:** This indicator measures the health of the human capital. With a good health the human capital is "fully operational" and can deliver contributions to the municipality. Good health indicates that the human capital is utilised in a good way and develops the human capital, whereas bad health indicates that the human capital is deteriorating. It exist a maximum level of utilisation of the human capital and when that is exceeded people's health decline. This could also indicate that there is not enough structural capital to cultivate and support the existing human capital – the human capital is overexploited.

**Population growth:** This indicator shows at what rate the human capital is growing in the municipality. If the population is decreasing there is need for further investments structural capital to leverage the human capital that is left in order to keep the welfare on the same level. If the population is showing growth the municipality must make sure that there is structural capital to support and utilise the increasing human capital and thereby increase the welfare.

**Bohemian index:** This indicator was first introduced by Richard Florida. In it he measures the rate of artists, actors, painters and authors and says that their creativity influences the creativity in the society. The existence of bohemians will also supply the municipality with a larger supply of culture, music and other factors that will attract creative people. There are available information at SCB about people occupied in different professions such as artist, actors and painters. The problem is that if there are one actor and one painter in a municipality that are such a tiny part of the residents that no valid outcome of the indicator is possible.

**Unemployment:** Unemployment measures the use of the existing human capital. With a high level of unemployment there is a lot of human capital that is not utilised and there will be no outcome of the investments made. A low level of unemployment indicates that the municipality has a reserve of human capital and that there could be a imbalance between the human and structural capital.

## 5.6.2 Structure capital

### 5.6.2.1 Organisation Capital

**Media supply in public libraries:** This indicates the availability of public resources and aims to provide with a description of a structural asset that can leverage on the human capital in the municipality. With a large supply of media the existing human capital can be levered and developed to further increase and retain the level of human capital. This will be used as a proxy of cultural services the municipality provide where a high level indicates that the municipality has a high cultural structural capital.

**Business climate:** This indicates how easy it is to start a new business in the municipality and how much support entrepreneurs get from various resources in the municipality. With a good business climate the human capital will be levered when creating and encourage people to start new businesses.

**Crime rate:** This indicates how safe the community is and how efficient the municipality is in reducing crime. Although the crime prevention is administered on a national level there are a number of initiative from municipalities that could lower the crime rate. Crime rate tells us a lot about the quality of life in the area. This is also a factor of attraction where low crime rate is beneficial. In an IC Navigator perspective this fits under the process focus and it will be included in the organisational capital in our model.

**Number of patents registered at PRV (Patent and Registration Office of Sweden):** This is a commonly used indicator when measuring IC. It shows the inhabitants entrepreneurial skills and is a structural capital indicator. According to PRV isn't the indicator available on municipal level – currently only on regional and national level. There have been several objections raised against the use of this type of data to uncover innovations though (Törnqvist, 2002). All innovations are not recorded at PRV and there are also patents that do not lead to commercial products. There is also a risk that the innovations will be registered at the location of head-offices rather than where they were invented (Törnqvist, 2002).

**Number of business start-ups:** Just as the indicator above this is an outcome indicator of the human capital that is also common in this type of investigation. The number of business start-ups provides structural capital. The number of business start-ups is not available on municipal level according to the Swedish Institute for Growth Policy Studies ([www.itps.se](http://www.itps.se)) but may be become available in the future.

**Customer satisfaction:** Scorecard how satisfied the inhabitants are with the municipality. This indicator would provide the municipality with a customer perspective and feedback on the perception of the municipality. This would also give an indication if the inhabitants are satisfied with the existing structural capital and also identify weaknesses from the inhabitants' perspective. Such an indicator could also provide with a indicator of the quality of life. Such a indicator is

currently not accessible in the majority of municipalities, although some do polls to establish how the population perceives the municipality. This type of index would be very gratuitous to include if they become available in the future.

**Broadband, w-LAN and 3G penetration:** This is a technology indicator that measures how well the communication infrastructure is developed and provides the human capital with important structural capital. With a high penetration of new communication technology the geographic location is of less importance and gives the human capital in the municipality access to the global market. As the development of communication infrastructure is very high in Sweden the importance is even greater since the lack of it would be a significant disadvantage.

**Availability of housing:** The availability of housing is important in order for the municipality to grow and to accommodate and attract the human capital. If there is a housing shortage the creative people could choose to live elsewhere and the region could lose the potential. Unfortunately this indicator is neither not available on municipality level.

**Administration efficiency:** The efficiency of the municipal administration is important in order to provide the human capital with swift and accurate service. If the administration is slow the effect could be that potential progress and development could be delayed and impeded and possibly be implemented elsewhere. This would be a highly interesting indicator to observe and a way for municipalities to see if they improve in efficiency. This could be a quantitative indicator but today it is most certainly qualitative since there are no central numbers or investigation concerning efficiency. This may be a bit controversial but certainly relevant.

**Supply of leisure activities:** This indicates the supply of zoological parks, recreation centres and other activities to recreate the human capital in the leisure time. If the inhabitants in the municipality have a good opportunity to entertain themselves when not working they could perform better at work and their brain power will be used in a better way. This is also a life quality raising indicator. It is hard though to draw a specific line, of course not every municipality got their own zoological park – this is a typical indicator when use of external structural capital would be of interest.

#### 5.6.2.2 Relational Capital (migration aspects)

**Gay index:** This is an indicator for equality and discrimination and fall within the relation capital and within Florida's tolerance, i.e. how tolerant the people are and how well they accept minorities. The ability of areas to accept and to embrace minorities and to build relations with people with different background is a competitive advantage and improves the leverage of the human capital. The numbers used are collected from an investigation accomplished by RFSL ([www.rfsl.se](http://www.rfsl.se)).

**Equality-index:** This is an index produced by SCB where they evaluate the equality between men and women in a number of areas such as education and salary. This index indicates the quality of

life in a society, where a municipality with a high range of equality is better. This also falls within Florida's tolerance reasoning and shows the progress of the community relative to the past. Equality is an indicator of the interaction between people.

**Integration:** Just as gay-index and equality this is an indicator of the quality of life which falls within human capital. This tells us how well foreigners are accepted and integrated in the community – how well the municipality is using the human capital of the immigrated people. This is measured by contrasting the unemployment between native-born and foreigners – the lower the difference the better. If the integration is poor the human capital reserve is large and the potential benefits of the structural capital will not be utilised. A low integration could also result in various problems with high crime rate and social disturbances in the community.

**Share of inhabitants born in a foreign country:** This indicator shows how well the municipality build relations with other cultures and people from different backgrounds. In an ever globalising world it is important to have knowledge that is diverse and a population with a diverse background in order to be competitive. A high share of foreign-born inhabitants is considered positive by Richard Florida and would provide the area with prerequisites for growth and prosperity. This however is not the entire story. A high level of foreign-born inhabitants could result in great problems if not integrated in the community. To complete this indicator we also add an integration indicator that measures the difference in unemployment in the groups. This indicator falls under relation capital, as it describes the relation building with external potential markets.

**Participation in election:** This indicator is used to describe the engagement of people in their community. A low election turnout could indicate that people do not care about the development in the area or feel that they are too distanced from what the administration is trying to achieve. This could also indicate that the inhabitants are more mobile and less loyal to the specific area. A high level of election turnout is beneficial and indicates that the municipality has managed to communicate what they do and what they want to develop, it signals engagement, which Richard Florida wrote, is an indicator of stability and continuity.

**Established relations with external cities or regions:** As mentioned in chapter four networks are important for future development and alliances form important tools of competitive advantage. Two municipalities with imbalances in the human or structural capital can together prove to be perfectly matched. By building relations with other areas the municipality takes a proactive role in developing and improving the performance of the municipality. Many municipalities have got established relations with other municipalities but how could we incorporate this in a quantitative model.

**Tourism:** A high level of tourism indicates the attractiveness of the area and also provides the municipality with through-traffic that could increase the exchange of knowledge. It also indicates the municipality's success in marketing and communicating the supremacy outside the area.



**Infrastructure:** The proximity to train stations, harbours, domestic and international airports and motorways form important relation capital. The infrastructure facilitates relation building and is important to reach important markets outside the municipality. The more developed the infrastructure is the bigger the reach of the municipality and thereby the potential leverage on the human capital in the area.

**Media, TV, radio:** The supply of media, TV and radio provide an important link to the rest of the world and a potential developer of the human capital. Several types of media could stimulate continuous learning and creative thinking.

**Commuting – into the municipality:** This indicator shows the autonomy of the municipality where a low level of commuters into the area could indicate that...

**Commuting – out from the municipality:** Some cities or municipalities are so called “sleeping cities” - the inhabitants live there but do not work there. This is an indicator of whether the municipality succeeds in creating jobs for their inhabitants and if they take advantage of the potential. With a high level of commuting from the area indicate that the inhabitants use other municipalities' structural capital to leverage their own human capital.

**Number of jobs within 30 minutes commuting range:** if the number of jobs in an area of 30 minutes are high most certainly the services are high, this creates a virtues circle. In Skåne the population, and therefore the number of employment and services of Skåne is concentrated to the south and west parts. There are no exact numbers but in the south west parts there are about 150 000-250 000 job opportunities within 30 minutes of commuting (Hur har det gått i Skåne, 2003). This could be compared to the south east parts where up to 50 000 jobs can be reached within 30 minutes.

**Use of external resources:** It is commonly applied that municipalities that does not have structural capital of their own use neighbouring municipalities' structure capital such as hospitals, schools, public baths, libraries, cinemas, science parks etcetera. In return these municipalities get a human capital injection. The question is who benefits the most from it? The municipality that uses others structural capital often only pay for the variable expense if anything. This is not an easy indicator to get a specific number on but it would be interesting if we were able to incorporate this in our study.

**Public transport:** The availability of public transport also provides an important resource to leverage on the human capital in the area. With a lot of connections with other cities and municipalities the market and the structural capital within reach is much greater.

The structure of the municipality determines what type of structural capital that should be invested in. Areas where a large number of people work outside the municipality need a different kind of structural capital compared to areas where the majority of inhabitants are senior citizens. It is vital

for the municipalities to understand their relative role in the geography in order to focus on the right investments and areas to develop.

### 5.6.3 Gross Regional Product

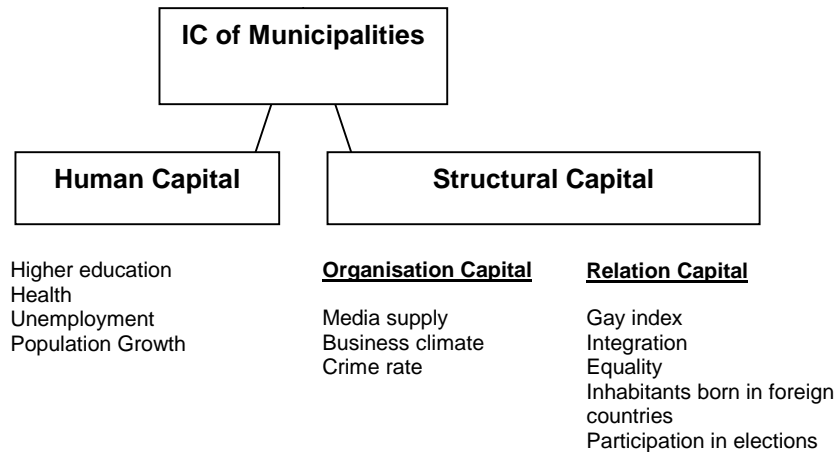
The gross regional product (GRP) is the regional correspondence to gross domestic product (GDP) and is the sum of value added by salaries and profit in the working sites in the region. According to Swedish Institute for Growth Policy Studies ([www.itps.se](http://www.itps.se)) the metropolitan areas of Sweden (i.e. Stockholm, Göteborg and Malmö) have the highest GRP per capita in their latest publication (Swedish Institute for Growth Policy Studies, 2004). Interesting to mention in this study is that Skåne has presented the highest average trend in GRP per occupied along with Västernorrlands län ([www.itps.se](http://www.itps.se)). To add another dimension to this study this financial focus indicator will be added for comparison.

IC Navigator	Region of Skåne	Indicators
Financial focus	<ul style="list-style-type: none"> <li>Change in Gross Regional Product</li> </ul>	<ul style="list-style-type: none"> <li>Gross Regional Product</li> </ul>
Renewal & Development focus	<ul style="list-style-type: none"> <li>Change in climate, acidification, quality of air, top dressing</li> <li>Business environment</li> </ul>	<ul style="list-style-type: none"> <li>Business environment</li> <li>Innovation</li> <li>Business start-ups</li> <li>Number of patents</li> <li>Broadband etc.</li> <li>Housing</li> <li>Think-tanks</li> <li>External relations</li> </ul>
Customer focus	<ul style="list-style-type: none"> <li>Migration patterns in certain groups</li> <li>Visitors in recreation areas</li> </ul>	<ul style="list-style-type: none"> <li>Culture supply</li> <li>Participation in election</li> <li>Customer satisfaction</li> <li>Leisure activities</li> <li>Gay index</li> <li>Equality</li> <li>Tourism</li> <li>Media, TV, radio</li> </ul>
Process focus	<ul style="list-style-type: none"> <li>Security</li> <li>Supply of employment, education and services</li> </ul>	<ul style="list-style-type: none"> <li>Crime rate</li> <li>Integration</li> <li>Commuting</li> <li>Administration efficiency</li> <li>Infrastructure</li> <li>Relationship building</li> <li>Use of external resources</li> <li>Public transports</li> </ul>
Human focus	<ul style="list-style-type: none"> <li>Employment level</li> <li>Level of education and learning</li> <li>Diversity of ethnic background</li> <li>Equality</li> <li>Health</li> </ul>	<ul style="list-style-type: none"> <li>Level of education</li> <li>Health</li> <li>Equality</li> <li>Population growth</li> <li>Share employed in high-tech occupations</li> <li>Age structure</li> <li>Early retirement</li> <li>Bohemian index</li> <li>Unemployment</li> <li>Inhabitants born in foreign countries</li> </ul>

Figure 5.4: IC Navigator versus Suggested Indicators

## 5.7 Presentation of results

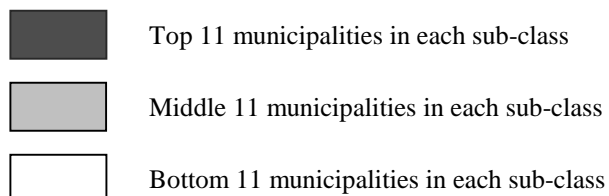
So far in this chapter the model has been decided and indicators that would provide a good description of regional IC have been identified. When applying the model many indicators proved not to be available and the final indicators used are presented below (Figure 5.5).



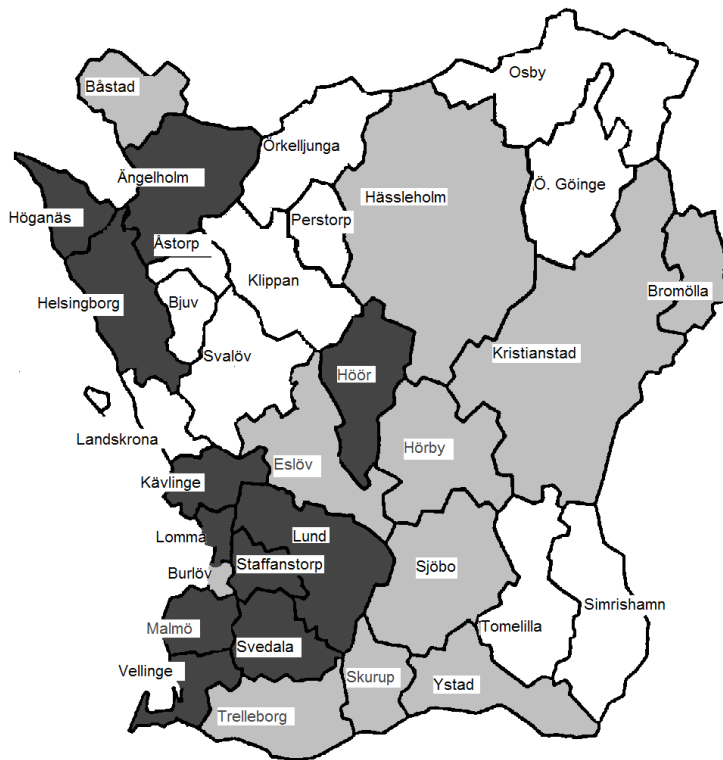
**Figure 5.5: Available Indicators Finally Used**

When executing and applying the model, indexing indicators and municipalities and finally giving them a total score in each of the three sub-classes to intellectual capital. Below we present how the municipalities scored in each of the three sub-classes to intellectual capital – human capital, relation capital and organisation capital. All indicators used have been indexed and all results are presented in *APPENDIX 5* along with the exact ranking of the municipalities in each sub-class. When all indicators in each sub-class are indexed the top five is calculated as an aggregated total when all indicators are included.

This is to be considered just a rough presentation of our results, further analysis and causal connections will be dealt with in chapter six – analysis. To present a visual presentation of human capital the map of Skåne (below) shows the human, organisational and relation capital spreading on regional level. The 33 municipalities were divided into three groups with 11 in each.



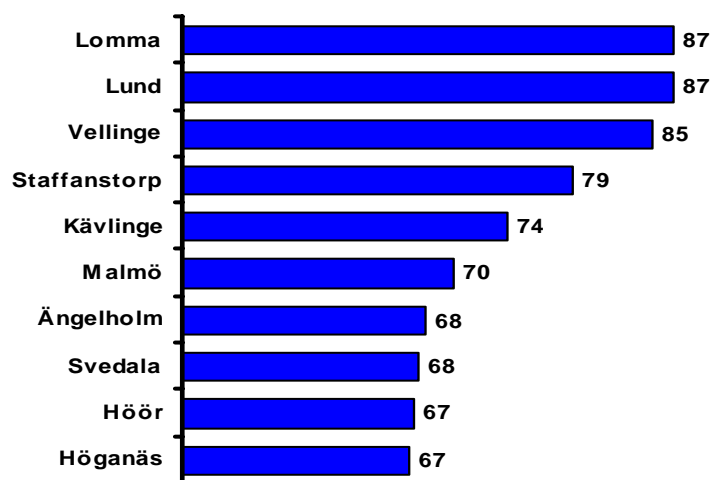
### 5.7.1 Human Capital



- The visualisation of the human capital shows that the highest concentration of human capital is in and around the largest cities in the region.
- The western part of Skåne has the biggest resources when it comes to human capital.
- Lomma and Lund receive top scores in the category

**Figure 5.6: Visualisation of the Human Capital**

The human capital is the sub-class that has been best described of the three. Although there are indicators that would improve the results – the used indicators give a fair description of the human capital in the region. The results show that the highest concentration of human capital is in and around the largest cities in the region and predominantly in the western parts of Skåne. Municipalities with a historically low tax-rate are found in the top ten. The human capital index is the average score in the benchmarking of the four indicators that were available. Full results are presented in *APPENDIX 7*.



**Figure 5.7: Top 10 - Average Human Capital Index**

### 5.7.2 Relation Capital



- The relation capital also scattered across the region
- Malmö receives top scores in the category
- The municipalities surrounding Malmö have a low level of relation capital

Figure 5.8: Visualisation of the Relation Capital

The relation capital is a sub-class where the indicators available do not capture the external relation capital but more the internal relation capital. The relation capital is scattered across the region with no certain pattern emerging. Malmö receives top scores in the category and interesting to notice is that the neighbouring municipalities have a low level of relation capital. The used indicators overlook the important external relation capital and indicators presented in 5.6.2.2 *Relation capital (migration aspects)* gives suggestions on indicators to evaluate this capital. The individual scores of the five indicators used are presented in full in APPENDIX 7.

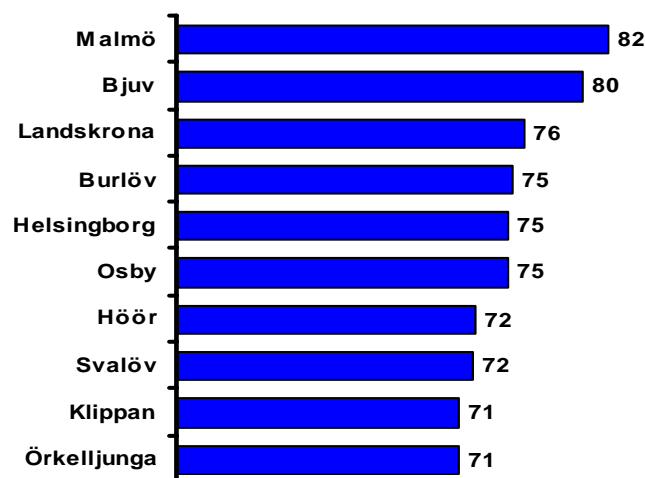


Figure 5.9: Top 10 - Average Relation Capital Index

### 5.7.3 Organisation Capital



- The organisation capital is rather scattered across the region and no pattern can be identified.
- Vellinge receives top scores in the category

Figure 5.10: Visualisation of the Organisation Capital

The organisation capital lacks indicators to describe the phenomenon reliable enough as only three indicators were available. There are many indicators that would improve the results such as patents and other presented in 5.6.2.1 Organisation Capital. There is no certain pattern emerging. Full results presented in APPENDIX 7.

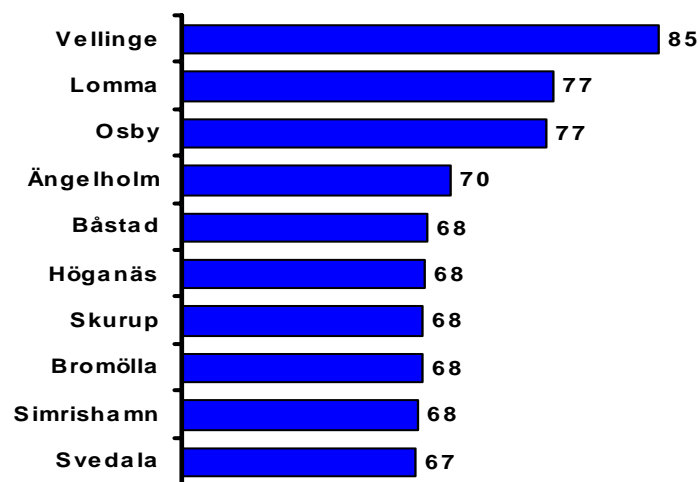


Figure 5.11: Top 10 - Average Organisation Capital Index

### 5.7.4 Gross Regional Product



- The GRP is mainly concentrated in and around the biggest cities in the region.
- Lund has the highest GRP per capita output in the region.

Figure 5.12: Visualisation of GRP per capita

The GRP is mainly concentrated to the big city areas with the area surrounding Malmö, Burlöv and Lund providing a specifically high output in GRP per capita terms. Neighbouring municipalities to cities with a high GRP have a low relative GRP output. The top 5 municipalities score better than the national GRP per capita average of SEK 263 000, and the region as a whole reach SEK 255 000 per capita. Full results presented in *APPENDIX 7 & 9*.

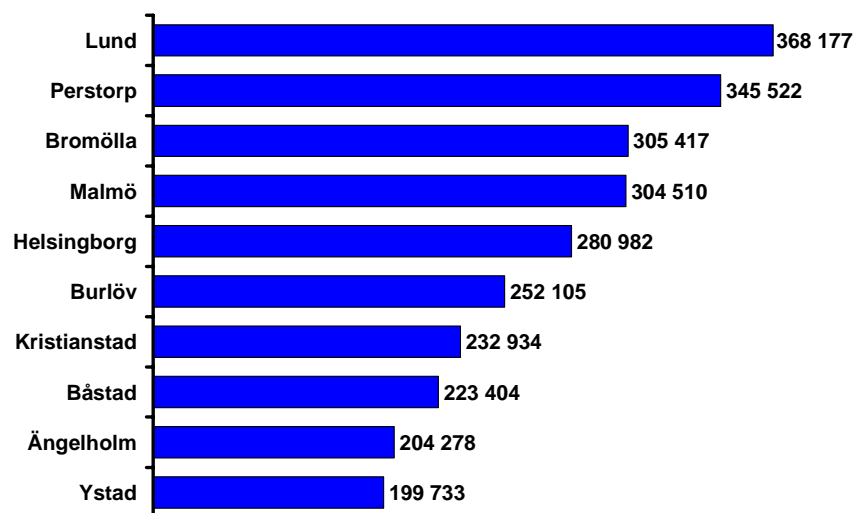


Figure 5.13: Top 10 - Gross Regional Product per capita in SEK (Individual Processing SCB, 2004)

### 5.7.5 IC Multiplier

To be able to further refine the analysis and to get a different perspective and deeper understanding of the results the IC multiplier has been calculated. Since the IC multiplier is structural capital divided with human capital and there are two ways to calculate the multiplier in this case since there are two classes of structural capital used in this thesis – using the relation capital and using the organisation capital. The multiplier was described in the theoretical framework chapter but to give a short review the multiplier should exceed one (1) otherwise there is an erosion effect as there is not enough structural capital to carry the human capital. As well as the multiplier the population growth has been incorporated where the municipalities with growth receive a bigger dot and those with decline are represented with a smaller dot. The results are presented below.

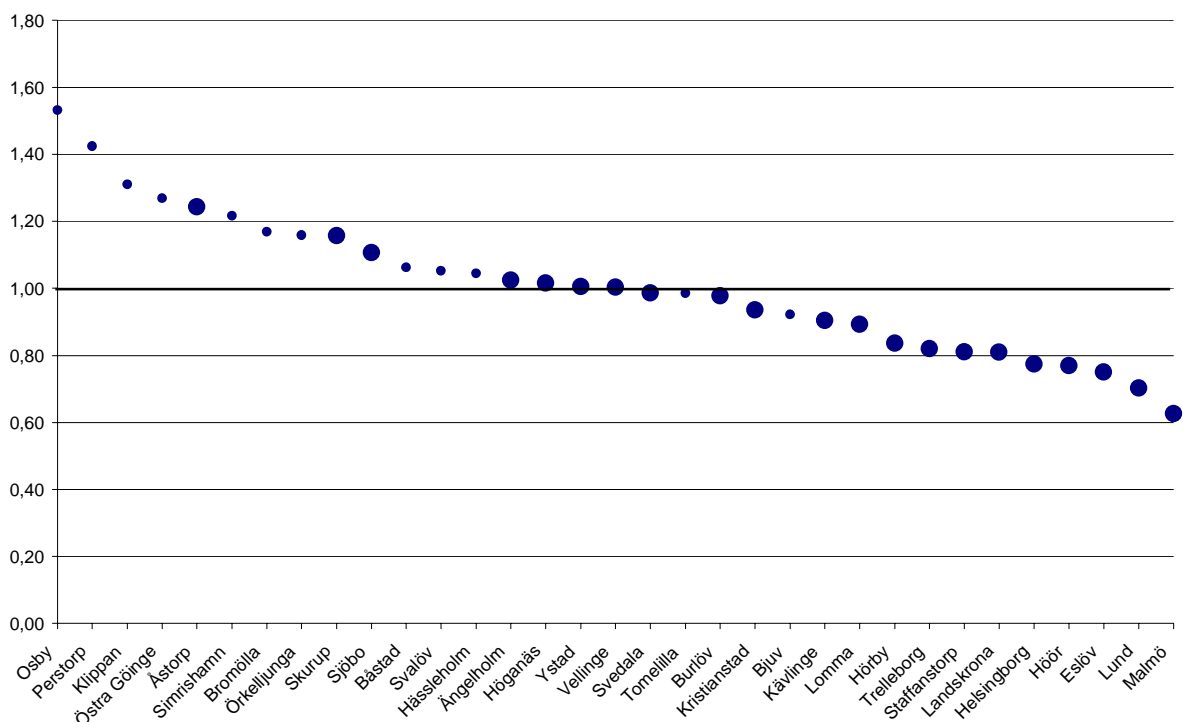
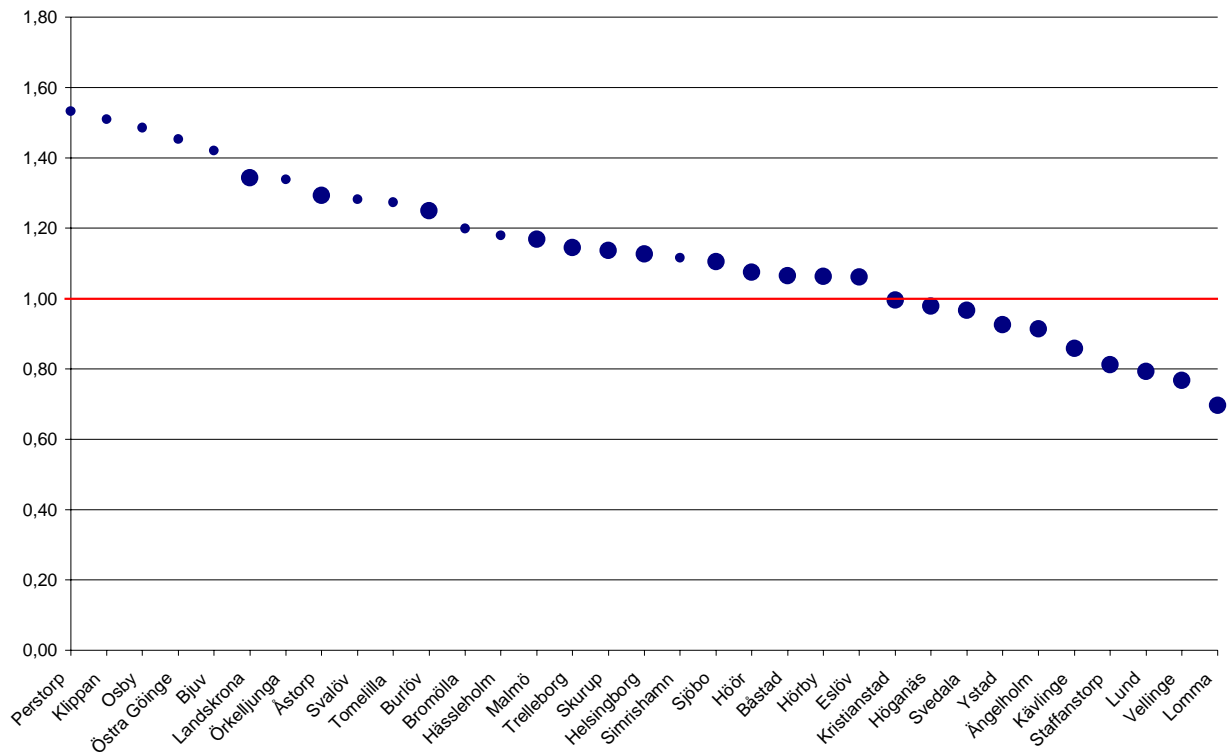


Figure 5.14: Organisation Capital/Human Capital

When executing the IC-Multiplier with organisation capital and human capital Osby, Perstorp and Klippan are in the top. Interesting to notice is that all top municipalities in a multiplier perspective have experienced a population decrease the last 10 years, while the bottom ranked 11 municipalities have had a population increase with up to 13% during the same period.





**Figure 5.15: Relation Capital/Human Capital**

The relation capital multiplier gives roughly the same result. The municipalities that have experienced growth score badly in the multiplier and vice versa. There are however a few exceptions. A possible source of error could be that municipalities experience a decrease in population growth. The human capital is disappearing and they are left with the structural capital – for these municipalities it is easier to get a high multiplier since there is less human capital left to carry.

## 6 Analysis

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*In this, the sixth, chapter the results of the study will be analysed and discussed. Further the outcomes and possible reasons of the outcomes, consequences and anomalies will be analysed and put into context. There will also be a interpretation of the region for future strategy development and management.*

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### 6.1 Introduction

The results of this thesis are presented as a review and ranking of the municipalities' intelligent resources in terms of human, relation and organisation capital. In previous chapters a wide range of indicators were observed that are used by different practitioners on intellectual capital. We have tried to create a prototype map of Skåne's intellectual capital by providing a picture as inclusive as possible but there have been a lot of impediments. The initial purpose, to prototype a map of the intellectual resources in the region, has gradually developed to answer if it is even possible to map the IC with the statistics available. Sveiby regards IC as social phenomenon which is very difficult to measure with a quantitative method and even with the right data and statistics it would be difficult to find causality to establish what drives the intellectual capital and with that future growth and prosperity. The concepts of human and structural capital are straightforward, although many different specific definitions are used. These features make the intellectual capital relatively easy to describe but harder to manage.

### 6.2 Three Sub-classes of Intellectual Capital – Analysed

#### 6.2.1 Human Capital

Human capital is one of the categories that we feel we have been able to capture on municipal level. The human capital is derived from the inhabitants in the municipality and there are substantial statistics of the educational level of the population. Similar data that has been used in previous studies on national level has proved to be unproblematic to find on municipal level. Skill, knowledge, capacity, talent are all different names for the human input – the human capital – that has been identified as an important factor in creating an intelligent area by all practitioners mentioned in this thesis. The basis for growth and development is a high level of human capital to create prerequisites to the region in the long run.

The results presented indicate that the highest quota of human capital can be found in the municipalities of Lomma and Lund. The reasons why a certain municipality has a certain level of human capital must be analysed individually to come up with a plan and strategy for further strategy development. In terms of Lund the presence of a university and a hospital certainly pushes the human capital score upwards. When it comes to Lomma the formerly low tax rate, proximity to the sea and the high price level on housing could explain the high level of human capital. There is also the argument that talented people attract other talented people (Florida). This could however also be described as a segregation problem.

When looking at the map visualising how the human capital is spread in Skåne (*figure 5.6*) it shows that the western parts generally have a higher quote of human capital. As described earlier, these parts have the highest number of employments within a 30 minutes range of commuting. The high level of human capital is of course not a coincidence as working opportunities tempt intelligence and vice versa. The phenomenon is however somewhat of “*chicken and egg*” character – what comes first, the chicken or the egg? The “*right*” people or development? It should also be noted that the “*right*” people for one municipality may not be the “*right*” people for the next – of course who is “*right*” walks hand in hand with the municipality’s strategy. Florida however believes that the talented people will bring growth and prosperity to the region which sounds reasonable. Nevertheless, to attract the “*right*” people from the beginning there ought to be other factors of attraction than just a similar crowd of people. It is reasonable to believe that personal preferences play an important role in where people decide to live. The results show that among the municipalities in Skåne there are a couple of municipalities that score significantly better than the rest of the region when it comes to human capital. These municipalities provide the region with a knowledge reserve that can be utilised by the entire region. On a municipal level the endeavour for a high level of human capital is not self evident, but for the region the total supply of human capital is vital. Human capital on its own does not create enough value – it needs structural capital as support in order to deliver outcome and impact to the region. If there is a shortage of human capital in a municipality it would have to attract and use external human capital. In general there is a high level of human capital in Skåne – but how should the municipalities act to get turbo on it? The answer lies within the structural capital.

Information about the age structure in the municipalities has been gathered, although it is difficult to include in a quantitative study, it is of highest interest. In order for the community to be viable long-term there has to be a balance between the age groups. Put in a cynical way a large share of old people will not benefit the municipality in the future; neither would a large share of middle aged. Young people stand for the renewal capital and will supply the entire region with new fresh human capital, elderly stands for experience and perhaps other aspects of human capital. Knowledge about the age structure facilitates future strategy development and resource allocation in municipalities. The age structure variable has the same characteristics as intellectual capital. It is difficult to arrive at a general conclusion by just determine the age structure, but if a municipality were to be analysed it would be an interesting factor to weigh in. The problem is yet again the old geographic structure and management system – each municipality is managed as an independent organisation with a responsibility for the result. Say for instance that a municipality has a very large share of old people and focus on attracting old people – the financial result would probably be dismal whereas other municipalities would benefit financially. Another interesting feature is that the human capital, unlike the structure capital, votes every four years and it is highly likely that this affect the resource management in the municipalities.

### 6.2.2 Organisation Capital

Organisation capital measures the internal structural capital and provides with an indicator of the environment for the inhabitants and the possibility for the inhabitants to leverage their human capital. There are several indicators that are proposed to describe the organisational capital in municipalities but not many are available. We believe however that there is a hidden resource in the municipalities that often have more detailed data and statistics available for internal purposes. This would have to be aggregated and quality assured before using it in similar attempts to quantify the organisational capital. The results of our model indicate that Vellinge and Lomma receive top scores in the category. It is possible that these results are correct but the lack of more indicators to appoint this makes the result invalid. In the model finally applied there were only three indicators that we were able to incorporate to describe the organisation capital. Three indicators are to be considered way to few, each indicator has an enormous effect on the results and in this case the advantages of an active weighting system are clear. Or is “*media supply per capita*” as important as “*local business environment*”? The answer will differ with the person answering. The main areas that are missing in the description of the organisation capital are innovation, patent and technology indicators – these are all indicators included by many of the theorists presented. The indicators would be an addition to describe the structural capital and how the human capital is used. Although such indicators can be misleading as Törnqvist discussed that patents may not be registered where the innovation was born.

### 6.2.3 Relation Capital

The external relation capital is an indicator that is perhaps the most important of the three when reviewing IC on a municipal level. Very few municipalities are self provided and they need the interaction and relations with other areas in order to survive and to get the supply of human and structural capital needed. The problem however has proved to find data and statistics that provide a good description of the relations, networks and links with other municipalities. Our model has focused mainly on indicators that describe the internal relation capital – that is how well the municipality is communicating and building internal relations. In chapter five we propose a number of indicators that could provide a good description of the external relation capital but currently they are not available.

The municipalities of Malmö and Bjuv get the highest scores in internal relation capital according to this investigation; Malmö is the largest city in Skåne so it may be the most foreseeable result. More surprising may Bjuv be that rank in the bottom ten in both human and organisation capital. Of course one municipality can have a great share of human capital and a smaller share of structural or organisational capital or vice versa. The results are however doubtful, the proxies used to describe the relation capital are, what we find, the best indicators available but they do not capture the most interesting phenomenon – external relation capital. Another weakness is that very few indicators represent the entire category. If there were more data and statistics available each indicator would not influence the final result to the same extent. In general it is easier said than done to find

statistics that cover “twilight” areas – the same would most likely be experienced if the Öresund region were to be investigated.

Commuting is an interesting indicator that describes the relations with other municipalities on an individual level. There are two types of commuting – out of the area and into the area. For a single municipality it is impossible to generalise and say that one or the other is better and the answer depends on the specific resources in a municipality. A municipality with a low level of human capital would want to attract external human capital and endeavour a high level of commuting into the area. A municipality with a high level of human capital would benefit from commuting out of the area in order to borrow and utilise external structural capital. The latter is actually the most beneficial situation for the individual municipality as the income tax is allocated to the municipality in where the human capital resides. This brings up another question: Is it reasonable that taxes are paid where people live or should people pay taxes in the area where they work? If taxes are paid in the area where people live there must be a fair pricing system that rewards municipalities that contribute with a lot of structural capital to the region. There have been a lot of discussions and argumentation between Denmark and Sweden with regards to where you should pay tax depending on where you work or live. Remarkably there are few discussions on municipal level and the old system prevails.

Within relation capital different indicators of tolerance are incorporated as advocated by Florida. Beyond the indicators included in this study (integration, equality and gay-index) it is important that the community has a high level of tolerance for failure. If a community does not accept occasional failures there will be no incentive for entrepreneurs or people in general to take risks that could lead to important ventures. North et al also address this type of problem with their “*No-risk versus Experimentation*” criteria and identifies that experimenting regions try out new things and allow mistakes and failures which increases the innovation potential. Integration brings up another topic to the agenda – the use versus abuse of competencies (North et al, 2004). Many municipalities have experienced difficulties in integrating people with foreign background which has given rise to an abuse of human capital where people with a university background work with less advanced tasks.

The entire region would benefit from a high level of relation capital as it increases the supply of both human and structural capital within reach of each municipality. On a municipal level the internal structural and human capital is not of utmost importance, but rather the supply of both in the surrounding areas. What is in low supply in one municipality can be borrowed from neighbouring municipalities. They will then have all structural capital they need without having to maintain or invest in it. An example is upper secondary school; the municipalities that do not have a school of their own send their students to neighbouring municipalities’ schools. The danger is that if all the inhabitants were to move out, although this is highly unlikely, the municipality is left with little of value. Borrowing structural capital is very common, not only at municipality level but also between countries.

Looking at relation capital in a GRP perspective it becomes even clearer that some municipalities are more dependant on external relations than others. For instance Lomma and Vellinge that receive top ranking in both organisation capital and human capital end up in the bottom when looking at GRP per capita. The fact that the GRP is significantly higher in “big city municipalities” also reinforces the conclusion that external relation capital is vital for many neighbouring municipalities.

#### 6.2.3.1 Twilight Zone

Edvinsson (2004) has experienced that unutilised resources and the potential on an intellectual level lies in the “*twilight zone*”, that is in between regions, along borders and outside the evaluated organisations. This was also something that Larvik municipality identified. Although the borrowing of structural and human capital already exists there is probably great potential in utilising and borrowing structural capital from neighbouring regions to increase the leverage on the human capital. It would have made this investigation more valid and thereby more interesting if we knew to what extent municipalities utilises each others structural and human capital. If a municipality is considered to be a dormitory with a high share of human capital, there is probably not enough structural capital to match the human capital (according to the IC multiplier). But then they could borrow or buy all structural capital needed from external sources.

In the case of Skåne the western parts have been identified as the area with a high concentration of human capital. The reasons for this are difficult to assess but the proximity to transports and border countries with Denmark, Germany and Poland certainly have played important roles. Although the knowledge era possibly will transform existing community structures, the industrial era still play an important role in terms of the requisites and location of the structural capital today. Countries have traditionally built and managed the structural capital in order to supply themselves with enough resources inside the borders. When borders gradually are fading the resources become available to other countries and probably overlap the resources in the neighbouring countries. This creates a zone where there is a disproportionate level of resources which could explain the concentration of human capital in the western part of Skåne. This brings another question to the agenda: How far does intellectual capital reach and how much intellectual capital is within reach? It is reasonable to assume that the reach of intellectual capital has to do with time - for instance how much IC is within a one-hour range. The geographic range all depend on the infrastructure - physical and electronic. Municipalities that are located far from transit areas and significant infrastructure should develop and focus on communication technology and other utilities that will improve the range of their resources and reach of external resources. This may in extension mean that Skåne has a greater potential of a high IC multiplier than Närke or Västmanland, who do not get the benefits of as powerful twilight zones since they are located in the middle of the country. The consequences of this are that municipalities should evaluate how much intellectual capital that is within their reach and develop their resource base accordingly. By ignoring the potential in external resources a phenomenon that could be called *municipal impotence* may well arise – the inability to perform albeit textbook settings.

### 6.2.3.2 IC Multiplier

The IC multiplier states that in order to develop the intellectual capital the structural capital must leverage the human capital (Edvinsson, 2000). As the benchmarking of the relation and organisation capital may be inadequate it is not possible to apply the IC multiplier and get relevant results. When trying to achieve an impact and efficiency measure we used the *IC multiplier* concept. The structural capital was divided by the human capital. The results showed to be ambiguous and can be interpreted in many ways. One of them is that the most efficient municipalities get high scores principally because they have got a low share of human capital and therefore do not need as much structural capital to get a good multiplier score. This is also a consequence of the reduction of inhabitants in a third of the municipalities in Skåne – the structural capital is static and remains constant as the human capital is reduced. Municipalities with growth experience the opposite predicament – the population is growing and there are not enough resources to build structural capital correspondingly. Although many significant indicators are not incorporated the outcome of this multiplier analysis is still of interest. The attempt showed that municipalities with a high level of human capital were theoretically eroding it due to the lack of structural capital. This rise the question if it is even relevant to apply the IC multiplier on a municipal level or on a region that interact and uses both structural and human capital from external areas? The answer is probably not. Although the information would be useful to show the current position of the municipality the most important information would not be captured. Lomma's high level of human capital is conceivably eroding if you were to isolate the municipality but as it works today with external relations and people commuting to Malmö and Lund the human capital in Lomma is developing and is leveraged in the surrounding areas. The *IC multiplier* could provide important information if you were to incorporate all structural and human capital that is within reach of the municipality. It might not be as interesting to only incorporate the resources within the boundaries of the municipality but also to include the resources within reach for the municipality – this feeds back to the discussion about the reach of structural and human capital.

## 6.3 Further analysis

Our initial purpose was to review the intellectual capital in Skåne and make an effort to develop a prototype of an intellectual capital map on municipal level. The first conclusion must be that the indicators available are not visualising the IC phenomenon good enough. This is likely due to the focus in the municipalities on “the old economy” accounting and traditional indicators. New indicators are needed to describe the knowledge economy and the quest for intelligence (5.6 *Presentation of Indicators*).

One problem could be, as pointed out, that the municipalities may be too small units to investigate independently and the borders should perhaps be drawn somewhere else. Each municipality, region, county, country etc is part of something larger and more complex and the exclusion of the surroundings seem to ignore the more important factors. Municipalities are reciprocally dependant on each other with regards to resources including human and structural capital. If it is like this it may not be reasonable to manage current municipalities as individual organisations; it should rather

be managed as an affiliate of a region and network. By this we mean that municipalities should be aware of what resources there are within reach in the region and try to utilise them in the best possible manner to leverage their resources – human and structural capital. This also entails knowing their position in the system, their part to play, and what they could add to the region. To be able to do this it is necessary to have a map of their and other's resources. The ignorance of this is called *municipal autism* by North et al and is the inability to communicate and form relationships with others. This also highlights the importance for municipalities to communicate their position to the surrounding world. If a municipality communicates a clear message where they are and where they are striving to be the surrounding world would operate accordingly which would benefit the region as a whole. Municipalities must also be proactive in the strategy development and change before change is forced upon them.

The current geographical division, administration and subsidies system impede the development of cross border utilisation as taxation is currently the key determinant. This questions why municipalities still are split as they have been for decades? Would there perhaps be a more efficient way of administrating the region and using the intellectual resources? If you for instance merged the municipalities in the south west corner of Skåne - would the result be more than the individual masses together? This is however very difficult to measure in a quantitative manner as statistical reports are focused on output and outcome in traditionally divided units such as municipalities, counties and regions. The geographic division of municipalities has been for many years and it is questionable if it still serves the purpose it once had. Is there any logic that the suburban municipalities are run independently when they are extremely dependant on the structural capital in the neighbouring city areas? Maybe the future responsibility in the local government councils is to have focus on supporting more networking and modern thinking. This could give rise to a phenomenon that is readily used in corporations - *insourcing* and *outsourcing*. The resources not available in the municipality could be insourced from other municipalities. A recent example includes a discussion surrounding the municipal environmental department where lack of resources makes it impossible for the smaller municipalities to have a full service department (SVT 2). An exchange of services would provide a better service level as well as a better use of resources. It is also possible that the geographic division result in a sub optimisation where investments in same type of resources cancel out the potential benefit.

If municipalities were able to more easily see themselves as a part of a greater system and network the result would possibly be a greater utilisation of the intellectual capital. The way municipalities are managed today there are many reasons for the administration of a municipality to make cuts in the structural capital instead of the human capital. If the municipality is operating with a budget deficit and the administration is considering a tax-raise, they risk getting replaced in the next general election. This forces them to make budget cuts, often in the structural capital, with the results that the leverage on the existing human capital further decreases and will in the long run worsen the budget deficit. An erosion of human capital begins which initiates a vicious circle. An example: Deteriorating health increases the load on the national health system which consequently needs more human or structural resources to cope with the increased demand (More structural



capital would increase the leverage and performance on all the existing human capital - more human capital would increase the output proportionally with the increase in human capital). This result in a deteriorating budget and cost-cutting demands from central administration to stay within budget - the result more often than not: Cost-cutting in the structural capital. Will this improve the health of people? Certainly not. It will decrease the impact of the existing human capital and accelerate the vicious circle. This behaviour has been described as municipal anorexia, where the municipalities make cuts in the wrong areas with the result that they practically starve themselves to extinction. A good question to ask is if this behaviour is due to ignorance or if it is a system failure? The behaviour is probably due to a number of factors where ignorance, laws, policies, accounting and management systems, tradition, and geographic division all play a role.

The tax-system is built around the fundament that you pay taxes in the municipality that you reside. Also this is a very old arrangement and could be an inefficient or unfair way to tax in the new knowledge economy. The problem with the system is that it is where the human capital is located and where the person lives that is the basis for taxation. This means that all municipalities want the human capital to reside in their area in order to reap the benefits. This creates competition to attract the human capital in order to get a higher tax income instead of co-operating with municipalities with a high level of human capital.

The trend the last few years has been that municipalities and regions are getting more competitive and the ability to capture and be aware of the surrounding environment is vital for survival. North et al have identified *autism* as an ignorance indicator that we believe is a fundamental factor that has to be dealt with in order to shift state from ignorant to intelligent.

## 7 Conclusions

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*This chapter will sum up the analysis and present the conclusions drawn. In the end further research proposals are presented.*

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This study has showed that the human capital is concentrated in the western parts of Skåne and predominantly close to the largest cities. This can depend on the overlapping intelligent capital in Sweden and Denmark that arise in the border country and the historic setting of Lund University.

Relation capital plays an important role for municipalities in order to achieve reach of the resources within the municipality and to use external resources within reach. Looking at the GDP output it becomes even clearer that many municipalities are dependant on external resources and that stresses the importance of relation capital. Insourcing and outsourcing of resources could improve the performance and leverage on the intellectual capital. Further expansion of the European Union with significant investments in Poland following could increase the reach of their intelligent capital, creating huge potential for Skåne.

There is a big difference between reach of resources and resources within reach. The resources within the single municipality's boundaries might not be as interesting as the resources in reach for the municipality. The reach of the internal resources and the supply of external resources within reach are probably more important than the administration of the municipality and the administration should shift focus accordingly. Instead of focusing on making the internal administration efficient the focus should be administering the resources, internal or external, in a more efficient way.

The proximity to structural capital and twilight zones with border country to Denmark, Germany, Poland and the Baltic countries could provide important resources in terms of structural capital that is beneficial to the region. Internationally, Sweden and Skåne have a high level of human capital and to improve the impact more structural capital or better utilisation of the existing structural capital is needed.

The overall analysis and conclusion of the results presented are that there are not enough indicators to review and benchmark the IC in Skåne's municipalities to create a reliable map. Municipalities are still focusing on traditional indicators even though they are not a profit-driven organisation. The mapping of intellectual resources and the intellectual capital in the region would provide the municipalities with intelligence in terms of knowledge of the competitive landscape in the very surroundings. It would also provide information of strengths and weaknesses and a possibility for municipalities to find and identify where their biggest resources are and where they find resources that complement their own intellectual capital. The inability to do this could result in *municipal impotence* – the inability to perform albeit textbook settings.

## **7.1 Further Research Proposals**

The model could be refined in order to capture the IC phenomenon in more detail. This would however not be possible without more data and statistics covering the indicators that would give the best description of the intellectual capital. A study that tries to establish which indicators that best describes intellectual capital on municipality level and to what extent they drive IC would also help the development and motivation of models with weighting of the indicators.

Measuring the intellectual capital in alternative geographic areas where you combine municipalities in order to get new geographic areas would provide very interesting information and address the discussion if it is reasonable to keep the old geographic divisions. This would also address the difficulty with external relations between the municipalities and focus on the intellectual capital in the area. Another interesting research proposal would be to map the intellectual capital within reach of a selected municipality. To benchmark the region of Skåne with the countries that recently joined the European Union would also be very interesting to see how Skåne stands up to this new competition in the internal market. As we have pointed out human capital in Skåne is concentrated in the western parts – but is this the centre of the human capital in the Öresund region? Maybe Denmark provides Öresund with even more human capital and the centre is Köpenhamn, Odense, Roskilde or somewhere else?

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## APPENDIX 1: National Intellectual Capital Index - NICI™

When measuring the Arab area the following indicators with stated weighting were used:

• National Human Capital Index (NHCI)	Weighting (%)
○ Literacy rate	30
○ Number of tertiary schools per capita relative to highest value	10
○ Percentage of primary school teachers with required qualifications	10
○ Number of tertiary students per capita relative to highest value	15
○ Cumulative tertiary graduates per capita relative to highest value	15
○ Percentage of male grade 1 intake	10
○ Percentage of female grade 1 intake	10
• National Process Capital Index (NPCI)	
○ Telephone mainlines per capita relative to highest value	20
○ Personal computers per capita relative to highest value	10
○ Internet host per capita relative to highest value	15
○ Internet users per capita relative to highest value	10
○ Mobile phones per capita relative to highest value	10
○ Radio receivers per capita relative to highest value	10
○ Television sets per capita relative to highest value	10
○ Newspaper circulation per capita relative to highest value	15
• National Market Capital Index (NMCI)	
○ High-technology exports as a percentage of GDP relative to the highest value	30
○ Number of patents granted by USPTO per capita relative to highest value	30
○ Number of meetings hosted per capita relative to highest value	40
• National Renewal Capital Index (NRCI)	
○ Book import as a percentage of GDP relative to highest value	10
○ Periodical imports as a percentage of GDP relative to highest value	10
○ Total R&D expenditures as a percentage of GDP relative to highest value	30
○ Number of ministry employees in R&D per capita relative to highest value	10
○ Number of university employees in R&D per capita relative to highest value	15
○ Tertiary expenditure as a percentage of public education funding	5

Website: [www.bontis.com](http://www.bontis.com)



## APPENDIX 2: Value Added Intellectual Coefficient - VAIC™

**Value Added (VA):** newly created value, calculated as follows

VA = operating profit + Employee costs + Depreciation + Amortisation                      or

VA = OUTPUT ( Total income) – INPUT ( All costs of purchasing goods and services from the market)

**Human Capital (HC):** overall employee expenses (salaries, education, training); In this analysis considered an investment, not cost, and thus not substantial part of INPUT any more.

**Structural Capital (SC):** results of Human Capital's performance (organisation, licenses, patents, image, standards, relationship with customers).

**Capital Employed (CE):** all material and financial assets.

**Human Capital Efficiency (HCE=VA/HC):** indicator which shows how much VA is created on each monetary unit invested in HC.

**Structural Capital Efficiency (SCE=SC/VA):** indicator that shows the share of SC in value creation.

**Intellectual Capital Efficiency (ICE=HCE+SCE):** Indicator which shows how efficiently IC has created value.

**Capital Employed Efficiency (CEE=VA/CE):** indicator that shows how much VA is created on each monetary unit invested in CE.

**Value Added Intellectual Coefficient (VAICTM=ICE+CEE):** indicates the value creation efficiency of all resources (sum of the previous indicators). It expresses the intellectual ability of a company, regional or national economy.

Website: [www.vaic-on.net](http://www.vaic-on.net)

### APPENDIX 3: Intellectual Capital Dynamic Value approach

The following indicators were used when applying the IC-dVAL approach on the European Union, USA and Japan.

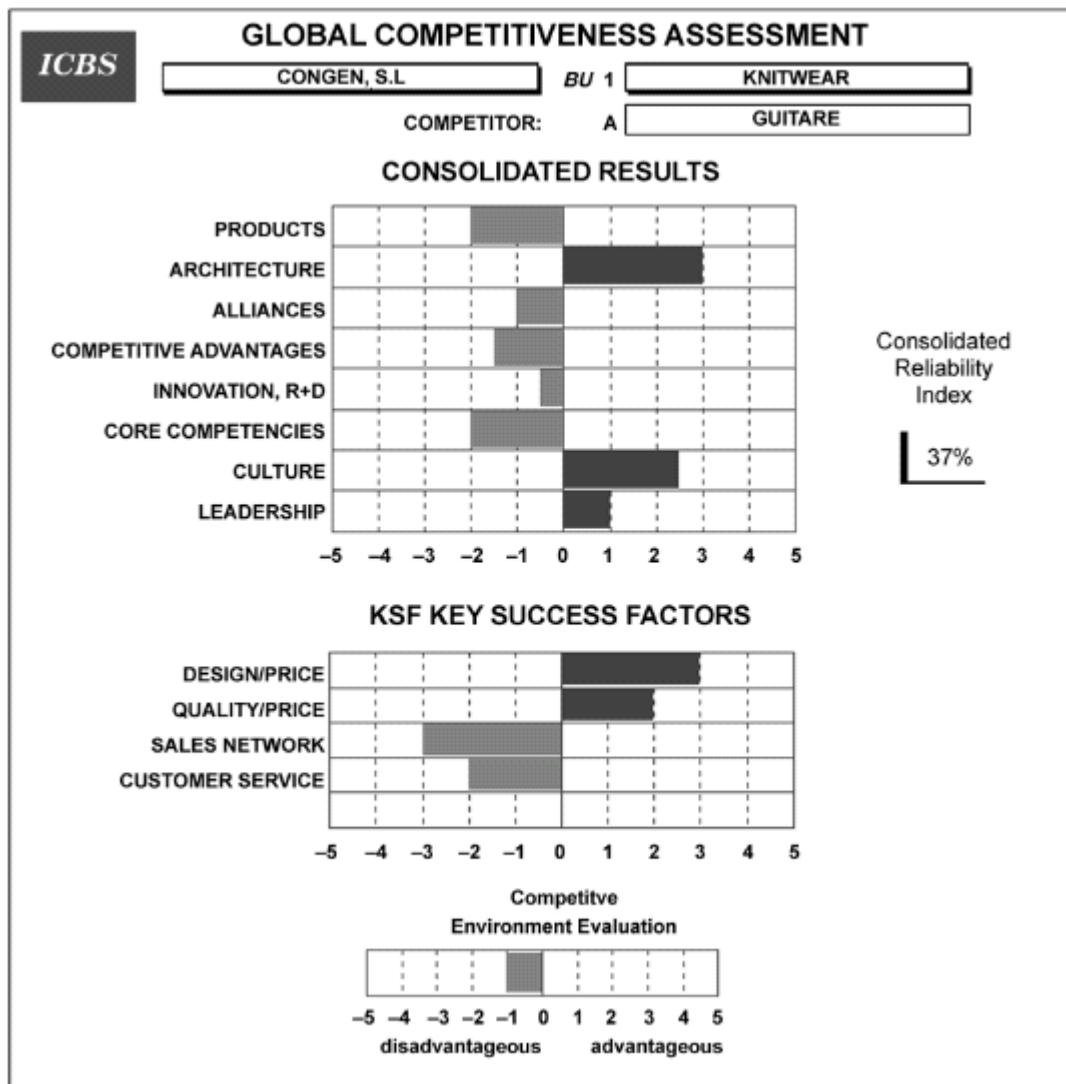
Indicators	Year/period
<b><i>Resources indices</i></b>	
Public expenditures R&D/GDP	1999
BERD/GDP	1999
Percentage of venture capital/GDP	2000
Percentage of new capital/GDP	2000
<b><i>Processes indices</i></b>	
Percentage of SMEs innovating in-house	1996
Percentage of SMEs innovating in cooperation	1996
Percentage of home Internet access	2000
Percentage of ICT markets/GDP	2000
Percentage of high-tech value added	1997
Labour productivity growth $\pm$ long-term	1991-1999
<b><i>Output indices</i></b>	
Percentage of innovating exports/total sales	1996
Unemployment rate	1999
Percentage of new-to-market products	1996
GDP per capita (PPS)	1999
Real GDP growth	1995-1999
<b><i>Asset indices</i></b>	
<b><i>A <math>\pm</math> structural capital indices</i></b>	
Number of scientific publications per million	1998
EPO high-tech patents/population	1999
US PTO hi-tech patents/ population	1998
<b><i>B <math>\pm</math> Human capital indices</i></b>	
Percentage of S&E graduates/20-29-age population	1999
Percentage of population with third education	2000
Lifelong learning	2000

## APPENDIX 4: Intelligent Capital Benchmarking System

The model is constructed around the following factors:

- (1) *Products*: products/services with their attributes and characteristics and functions.
- (2) *Architecture*: core business and outsourcing in the activities of the company.
- (3) *Alliances*: alliances, strategic networks, franchises and co-operative agreements.
- (4) *Competitive advantages*: competitive advantages generated in the different core business activities in the value chain.
- (5) *R&D innovation*: quality and professionalism in innovative and R&D activities.
- (6) *Core competencies*: essential knowledge or core competencies that make it possible and give way to competitive advantages.
- (7) *Culture*: cultural principles for success in a global context.
- (8) *Leadership*: human and professional features of the successful leaders.

Example of result using the ICBS approach:



(Viedma 2001)

## **APPENDIX 5: Kommunkompassen**

### **1 Public and democratic control**

- 1.1 How is the citizens informed?
- 1.2 How is the citizens' engagement encouraged?
- 1.3 How is the citizens informed of the results?

### **2 Availability and citizen orientation**

- 2.1 Has the municipality a user oriented approach?
- 2.2 What is done to improve the clarity to the citizens?
- 2.3 Can the users themselves influence the supply of services?
- 2.4 Are citizen polls performed?
- 2.5 How is the handling of complaints from citizens organised?
- 2.6 Are employees trained in encounter the public?

### **3 Openness in the interaction between politicians and civil servants**

- 3.1 What is the quality of the formulation of objectives?
- 3.2 How is delegation and responsibility allocated between political and administrative level?
- 3.3 How does the administration report to the political level?
- 3.4 How is the reciprocal understanding between politicians and administration personnel encouraged?

### **4 Management, decentralisation and delegation**

- 4.1 How free are the institutions/divisions to allocate their resources?
- 4.2 How are the possibilities for cooperation and coordination used across institutions/divisions?
- 4.3 How is the administrative leadership role clarified?
- 4.4 How is the central management applied?

### **5 Control and reporting**

- 5.1 How detailed is the report system?
- 5.2 Strategies to enlighten costs
- 5.3 Control and follow-up routines

### **6 Employee management**

- 6.1 How important is employee training and development?
- 6.2 Is there a performance related remuneration system?
- 6.3 Is there work environment studies?
- 6.4 Is management training done in collaboration with the municipality and the private sector?
- 6.5 What is the size of the training and development budget?

### **7 Development of operations**

- 7.1 Strategic development of services
- 7.2 Is the creativity and experience of the employees utilised actively?
- 7.3 How widespread is the use of IT?
- 7.4 Is benchmarking actively used as a tool of development?

### **8 The municipality's role as a community developer**

- 8.1 What does the municipality do to support community life?
- 8.2 The municipality's interaction with cultural activities
- 8.3 The municipality as partner to the trade and industry
- 8.4 International contacts

## APPENDIX 6: Larvik Kommune

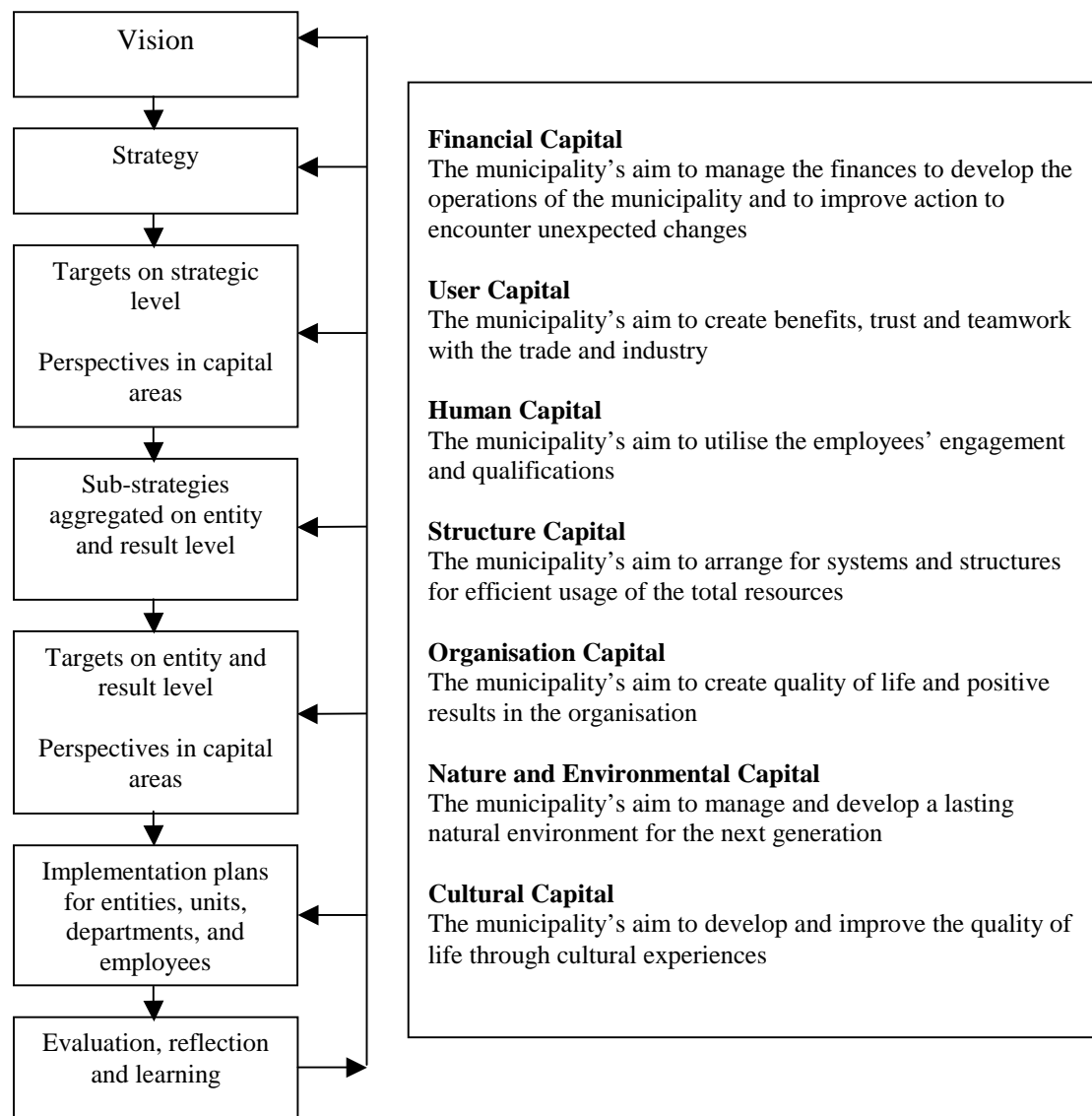
**Human capital aspects:** working environment, cultural minorities, average implementing period, and collaborator competence etcetera.

**Structure capital aspects:** how to treat complains, homepage activity and IT costs.

**Nature and Environmental Capital aspects:** this includes quality of bathwaters, road safety, consideration of environment in purchases, alternative energy sources etcetera.

**Relationship Capital aspects:** number of Norwegian visits, number of extern Norwegian lectures, co-operation with foreign participants, street life downtown etcetera.

**Culture Capital aspects:** number of cinemas/theatres/concerts, choice of activities in spare time, choice of cultural activities.



**Figure:** Larvik's work process with long-term strategy ([www.larvik.kommune.no](http://www.larvik.kommune.no))

## APPENDIX 7: Presentation of indicators used & indexed

### AVERAGE HUMAN CAPITAL INDEX

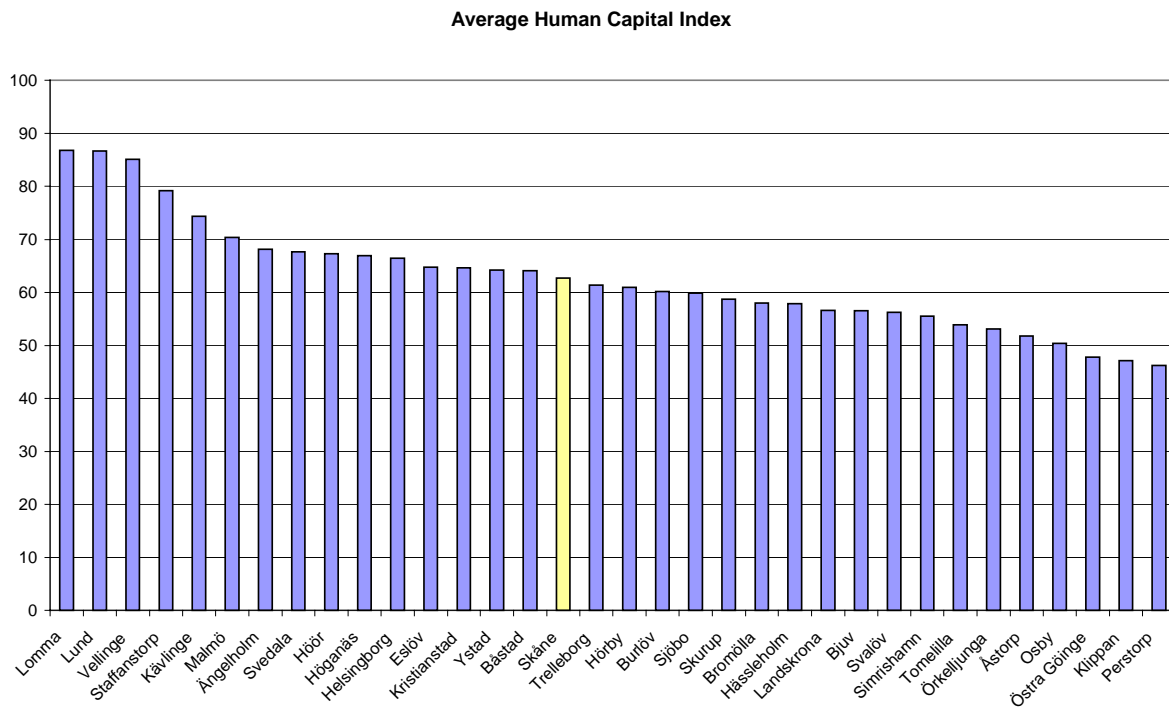


Figure: Average Human Capital Index

### AVERAGE ORGANISATION CAPITAL INDEX

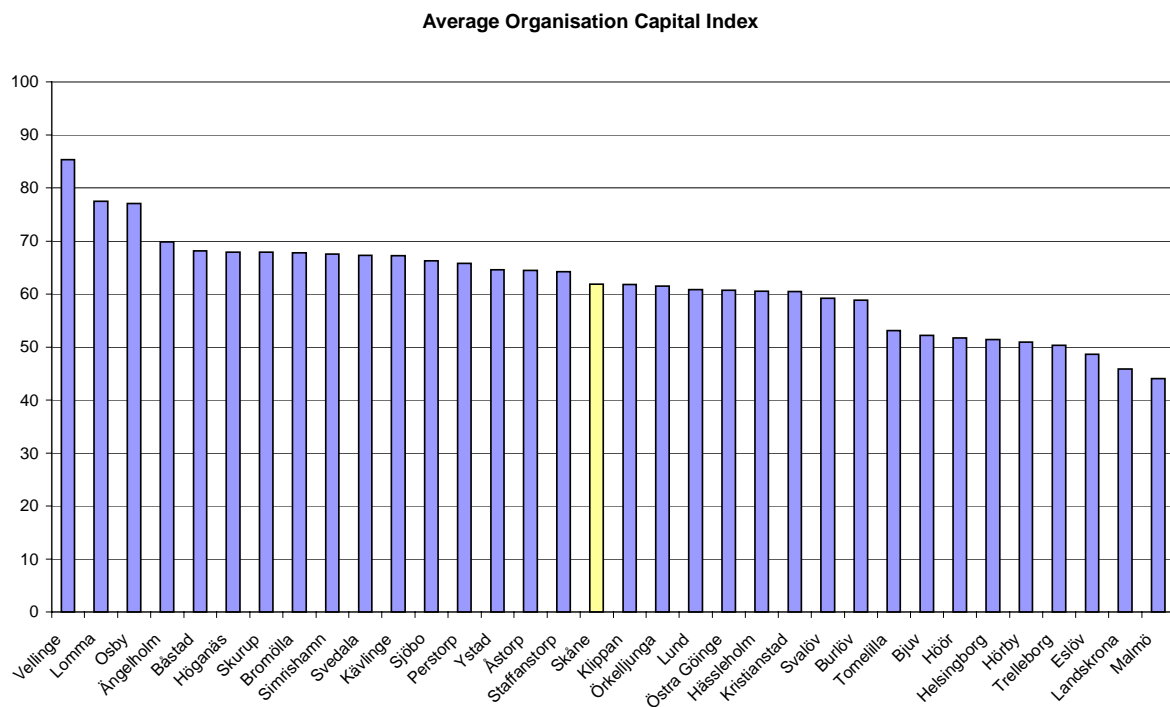


Figure: Average Organisation Capital Index

**AVERAGE RELATION CAPITAL INDEX**

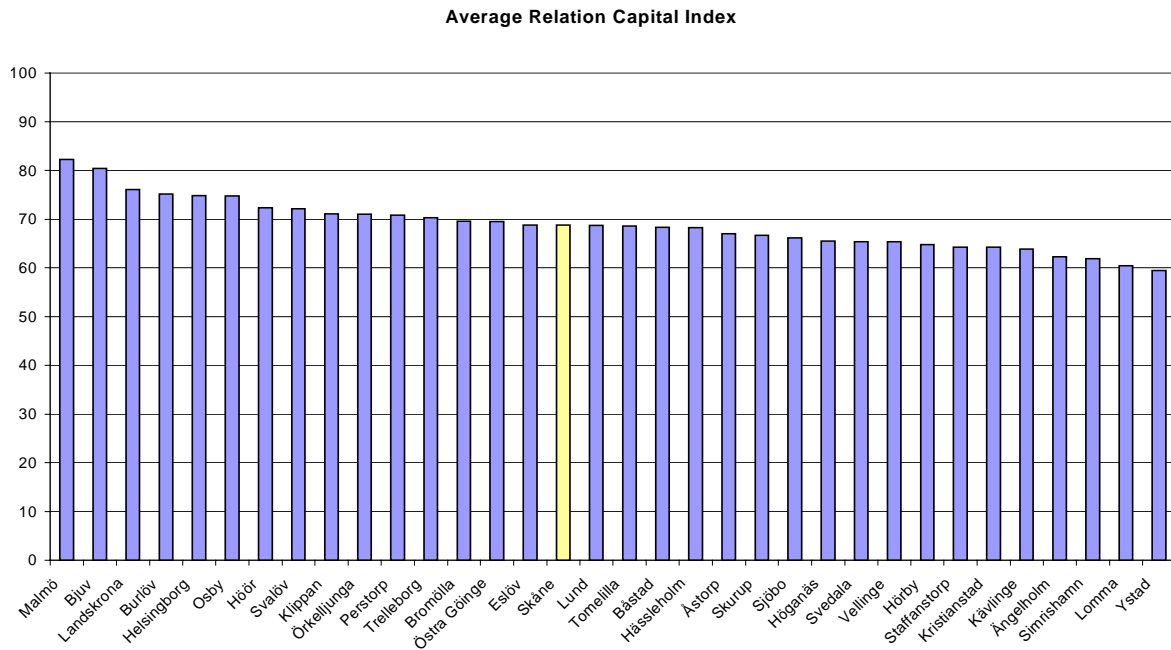


Figure: Average Relation Capital Index

**GROSS REGIONAL PRODUCT**

Gross Regional Product per Capita 2001

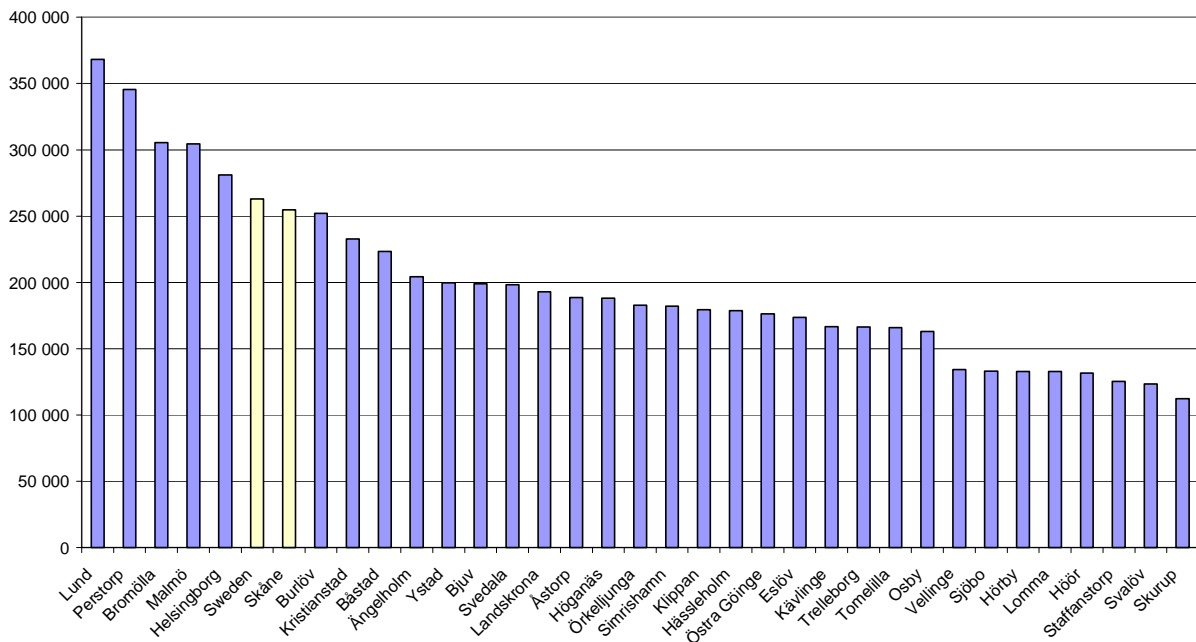
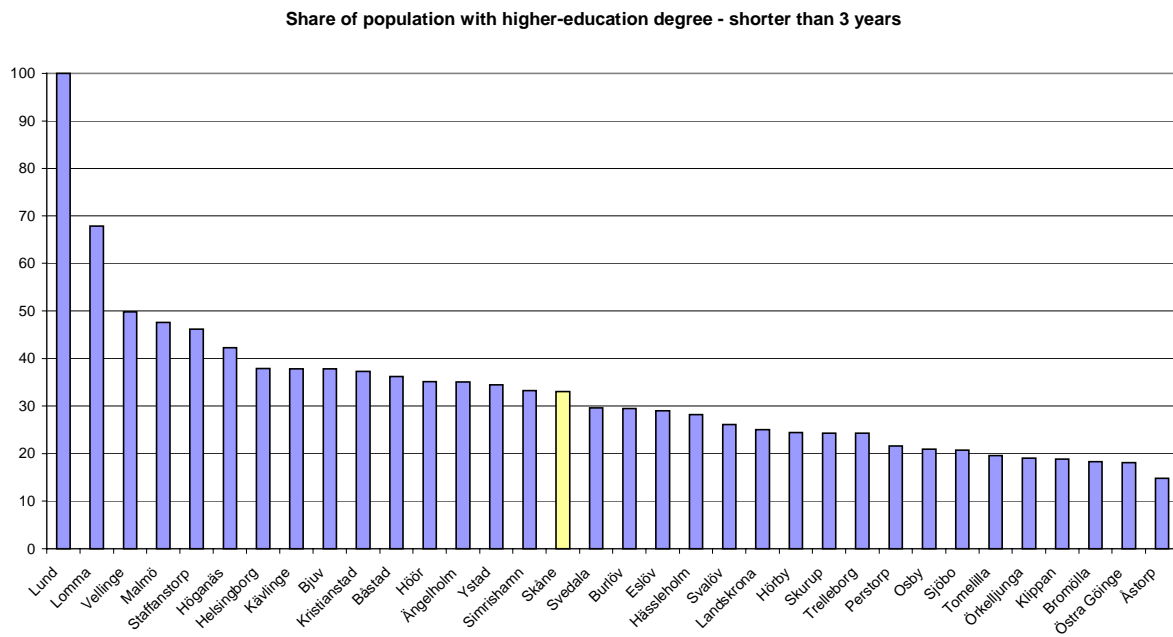
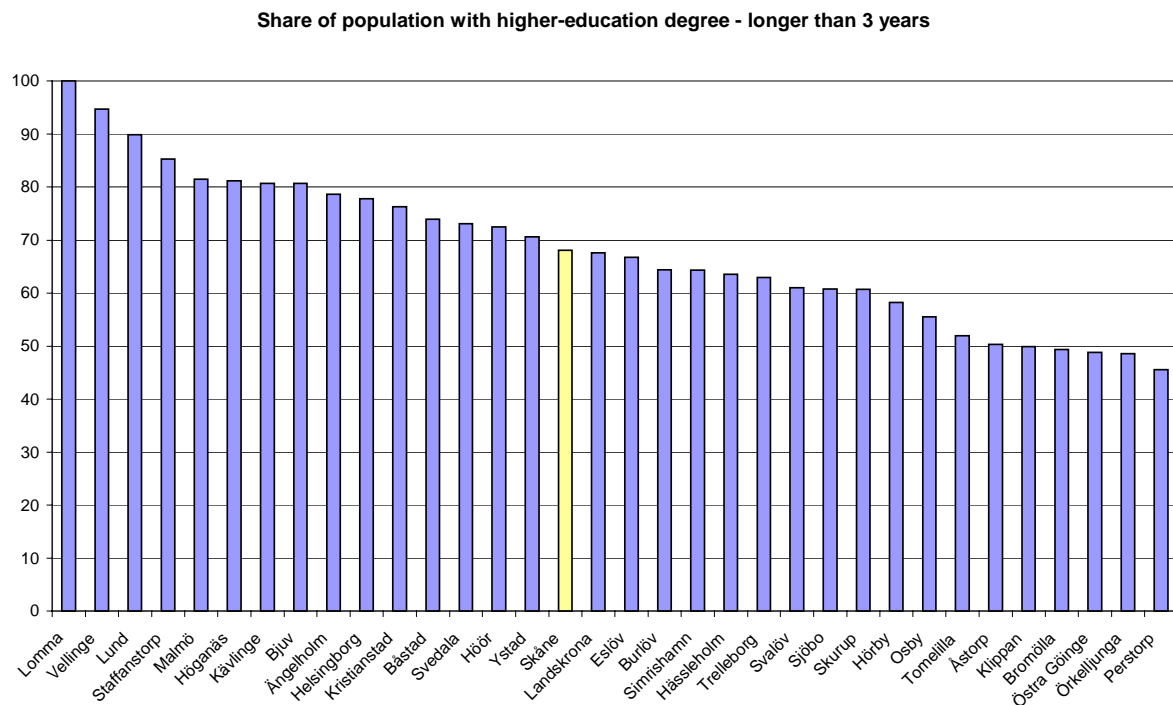


Figure: Gross Regional Product per capita 2001 (Individual Processing SCB, 2004)

**HUMAN CAPITAL**

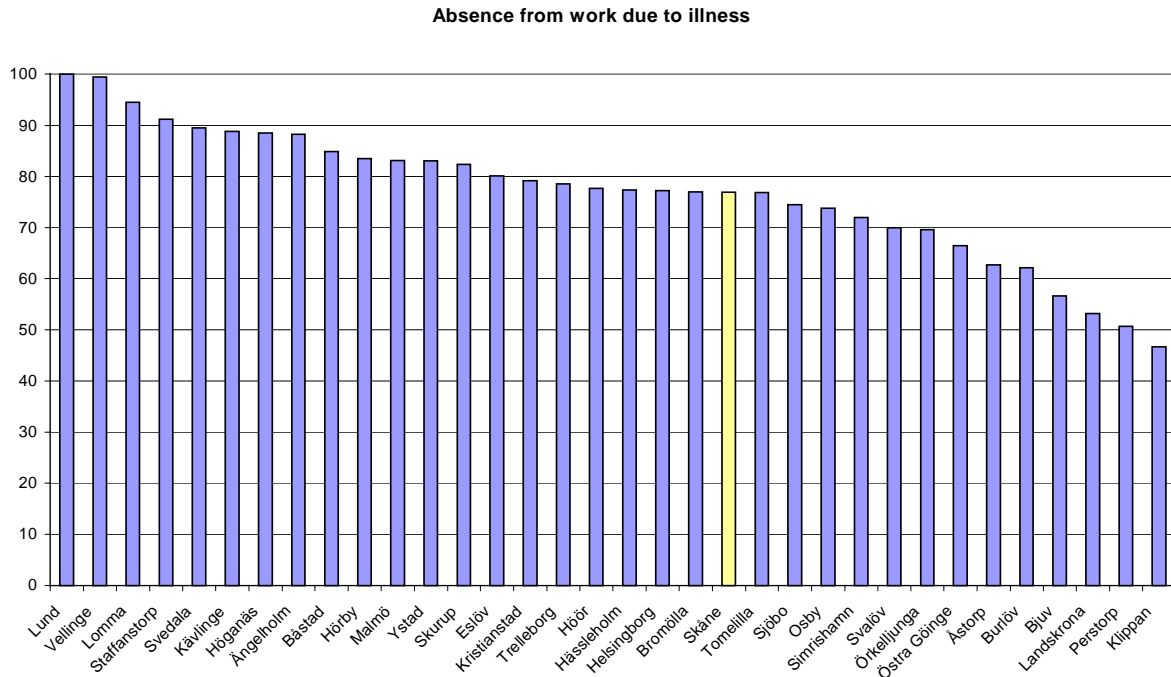


**Figure: Share of population with higher-education degree - shorter than 3 years (www.scb.se)**

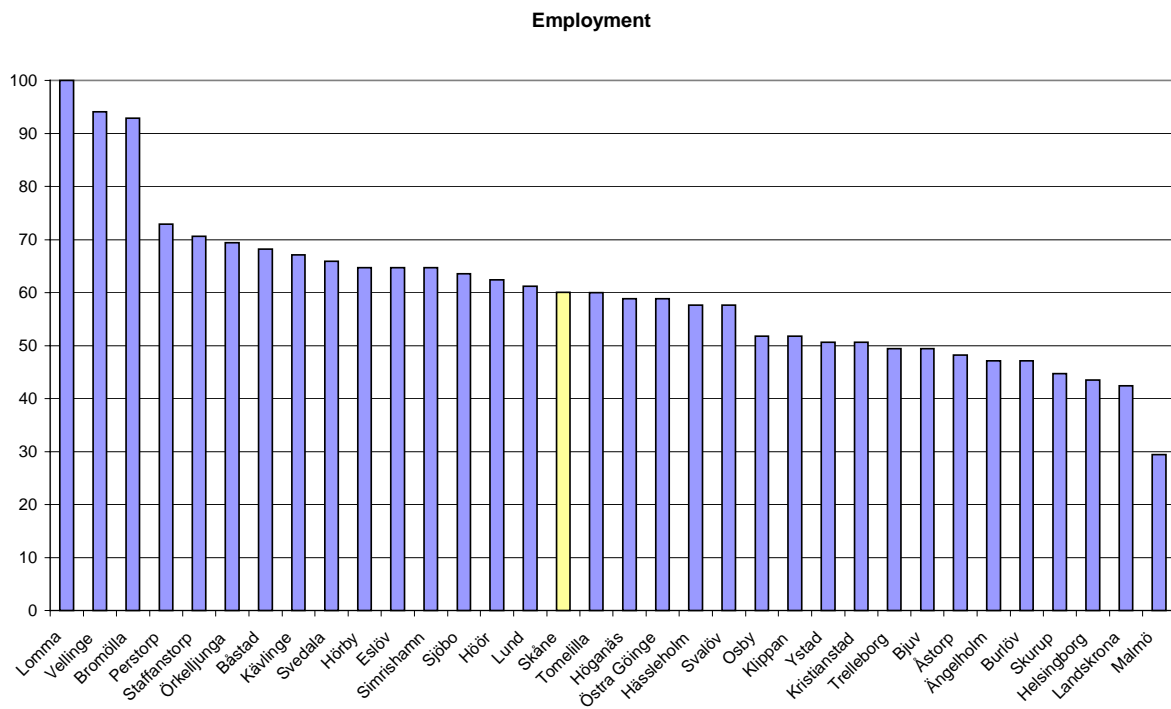


**Figure: Share of population with higher-education degree - longer than 3 years (www.scb.se)**





**Figure: Absence from work due to illness**  
(www.fhi.se)



**Figure: Employment** (www.scb.se)

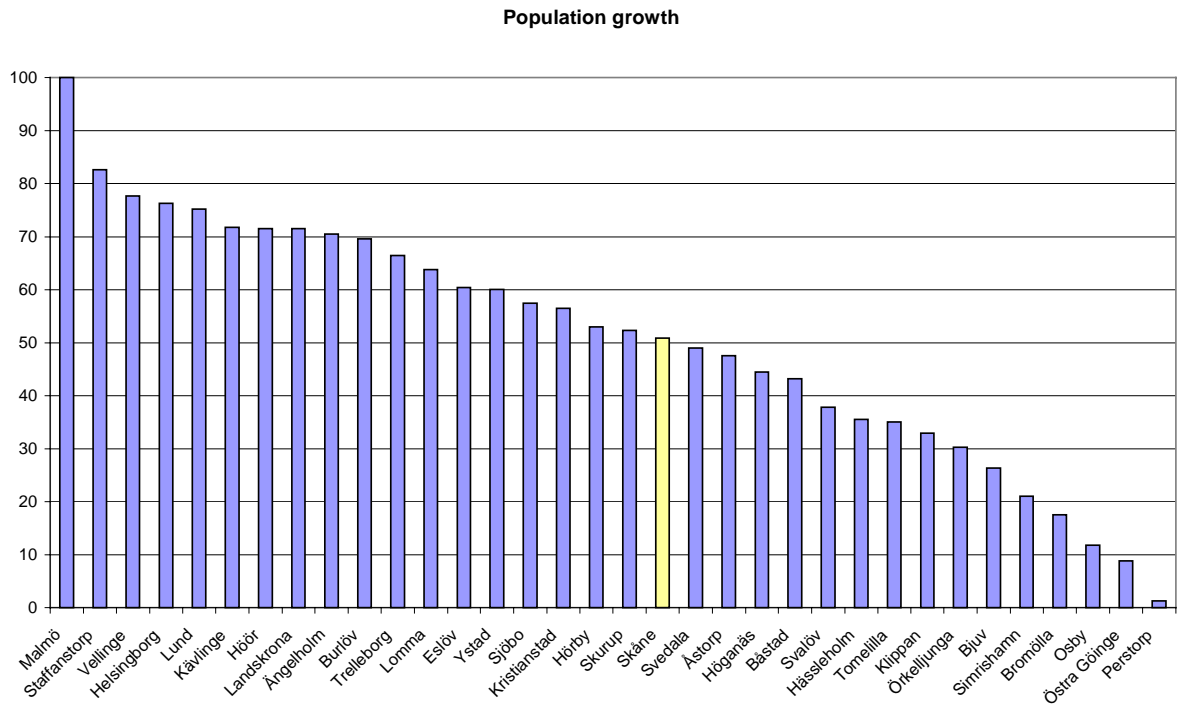


Figure: Population growth (www.scb.se)

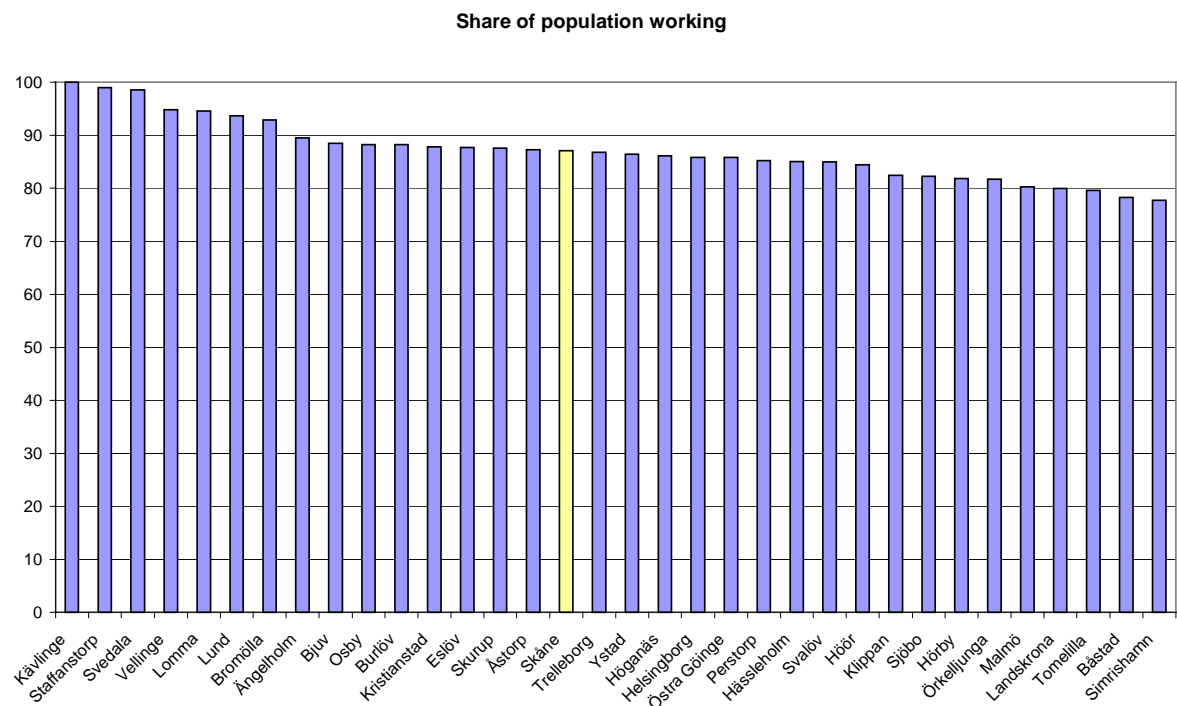


Figure: Share of population working (www.scb.se)

**STRUCTURAL CAPITAL – ORGANISATION CAPITAL**

Per capita media supply in public libraries

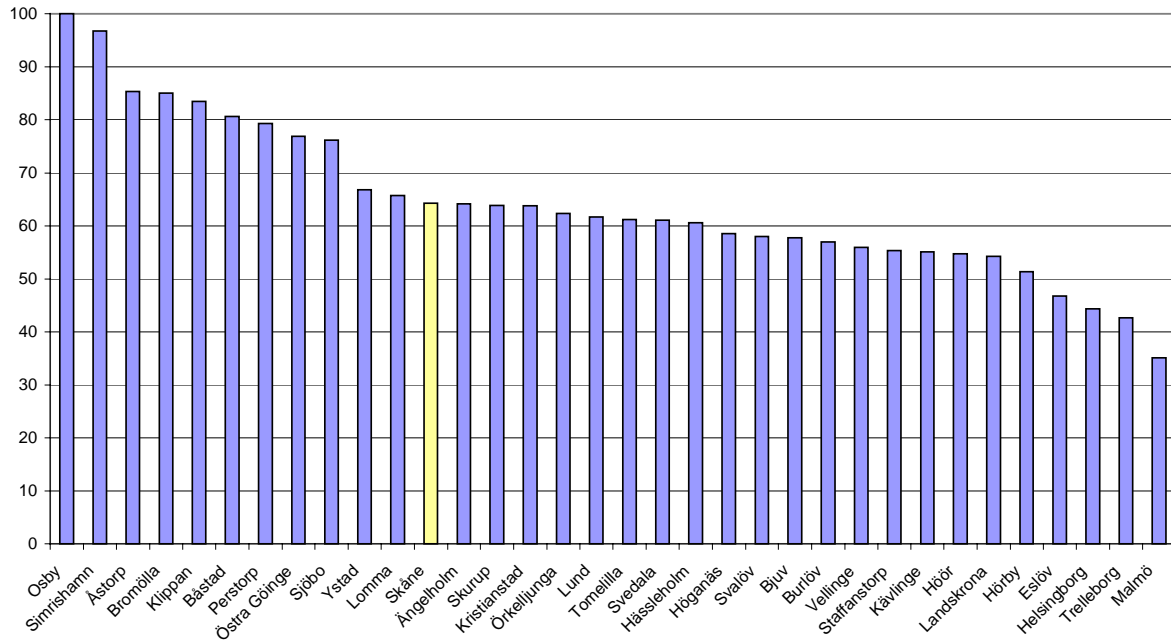


Figure: Per capita media supply in public libraries (www.scb.se)

Business environment

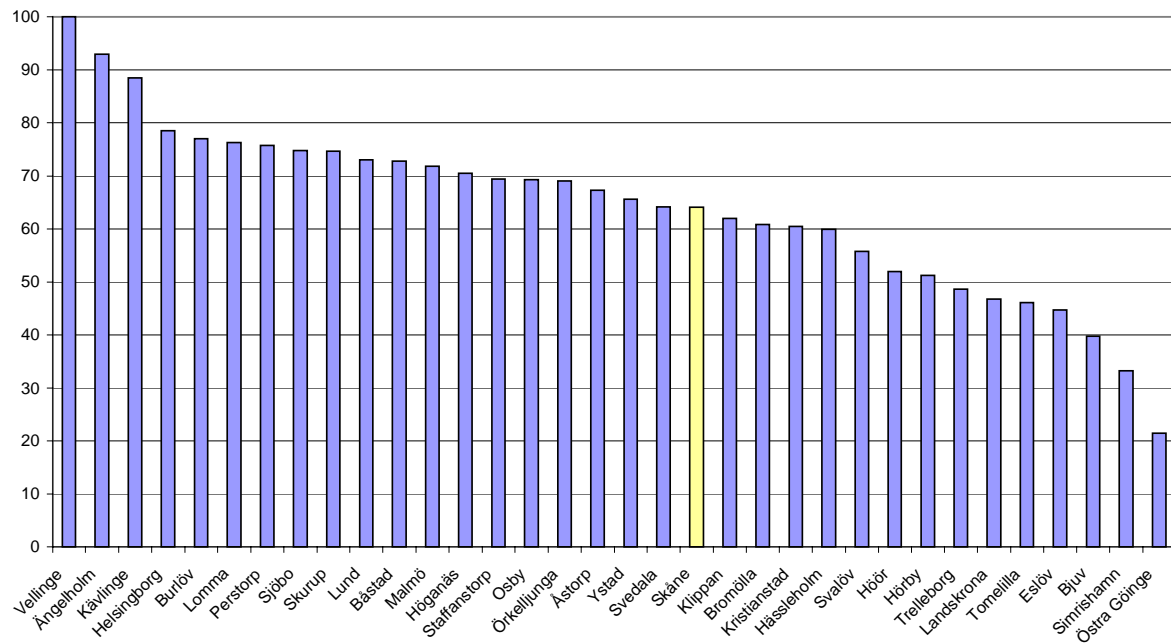


Figure: Business environment (www.kfakta.se)

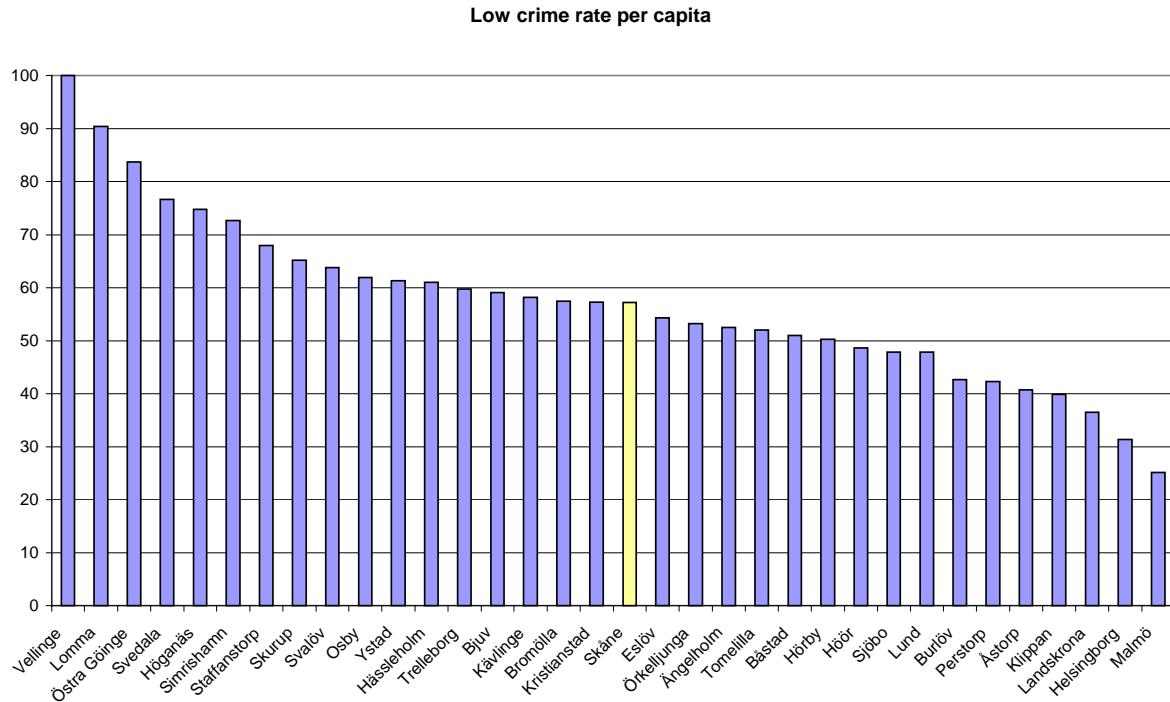


Figure: Low crime rate per capita (www.bra.se/web)

**STRUCTURAL CAPITAL – RELATION CAPITAL**

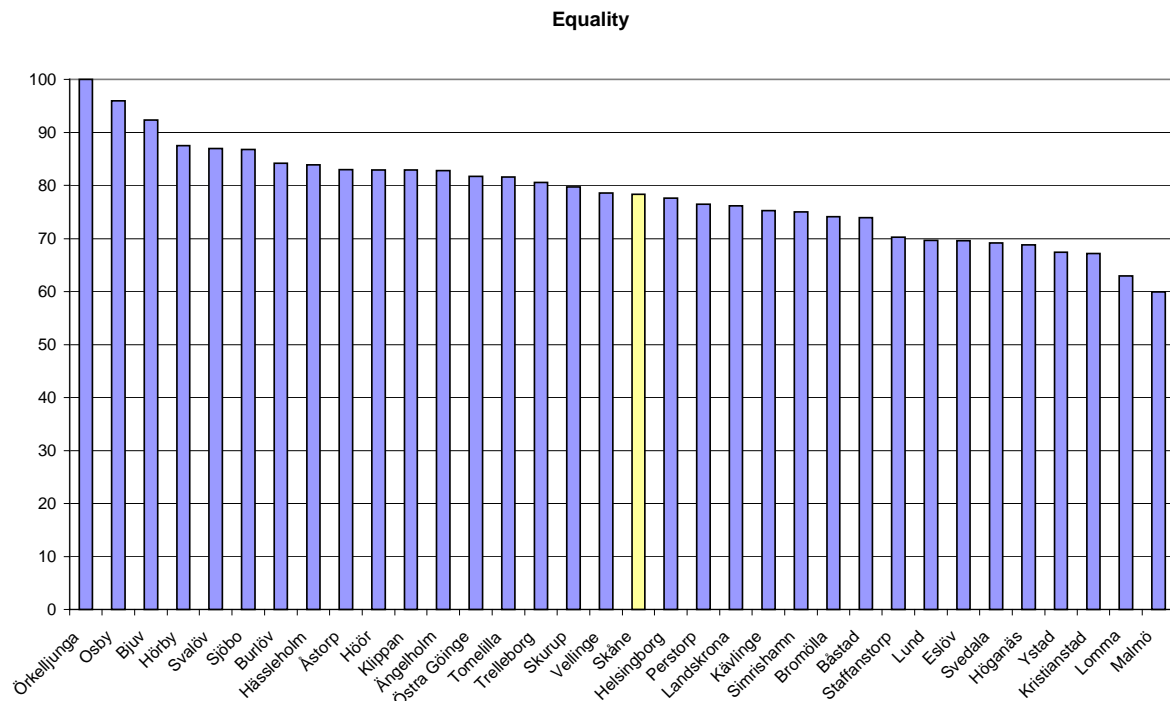
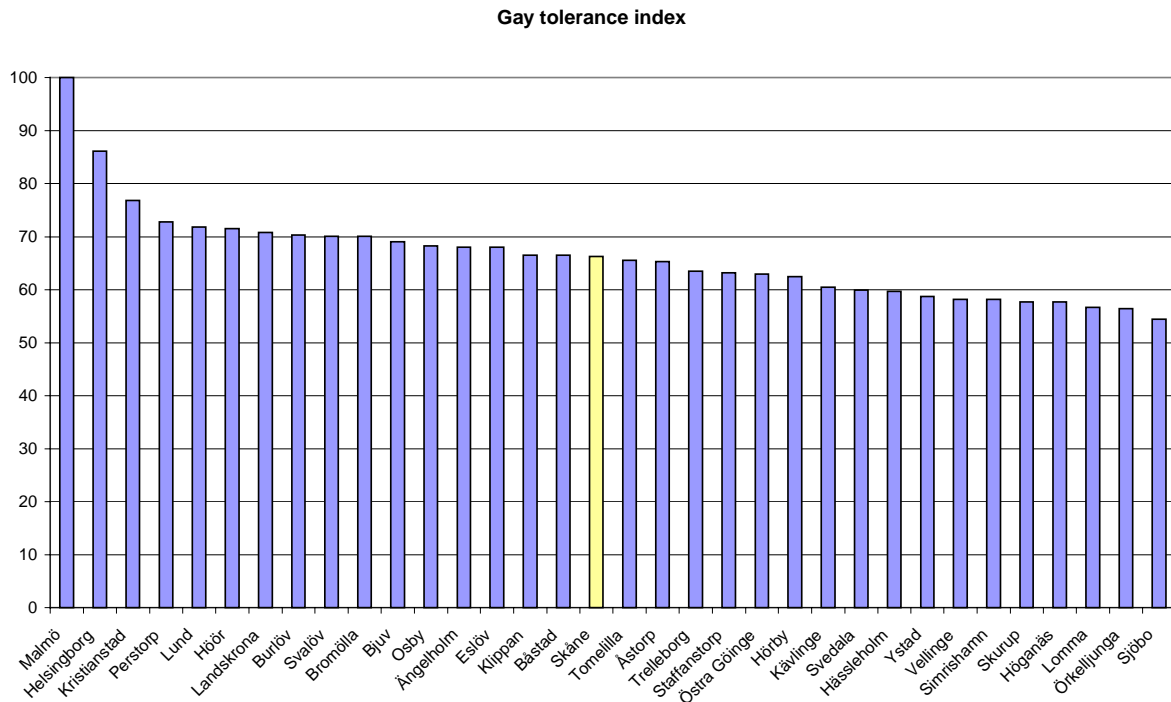
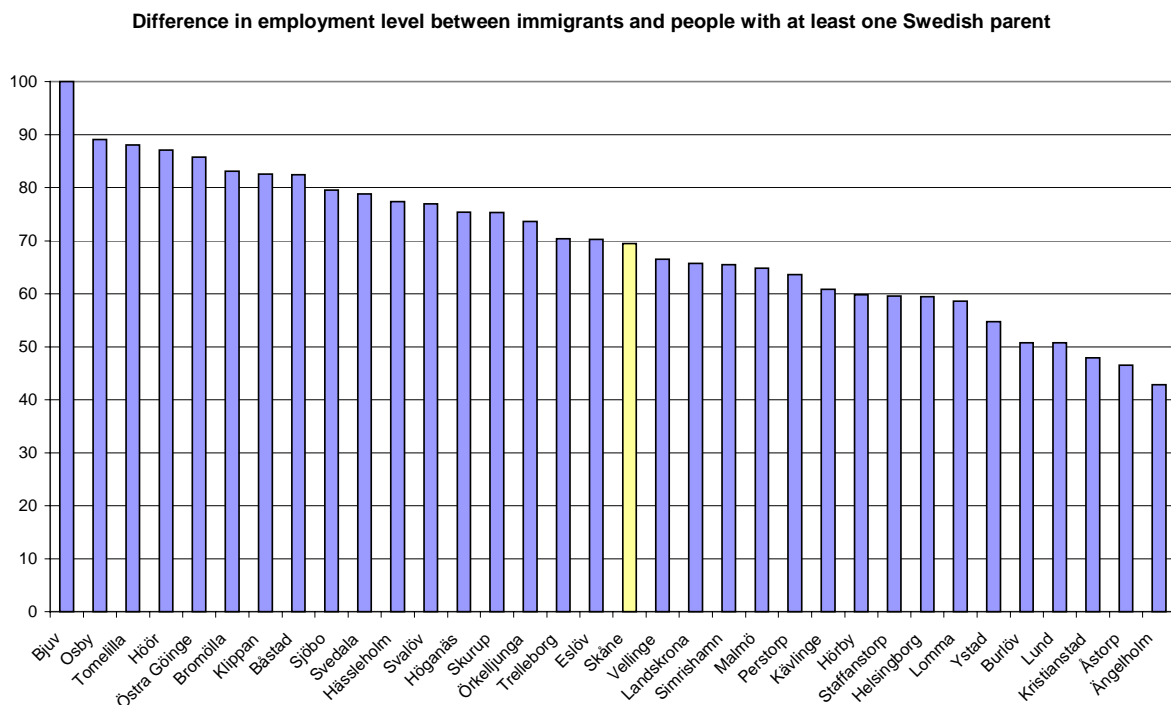


Figure: Equality (www.scb.se)

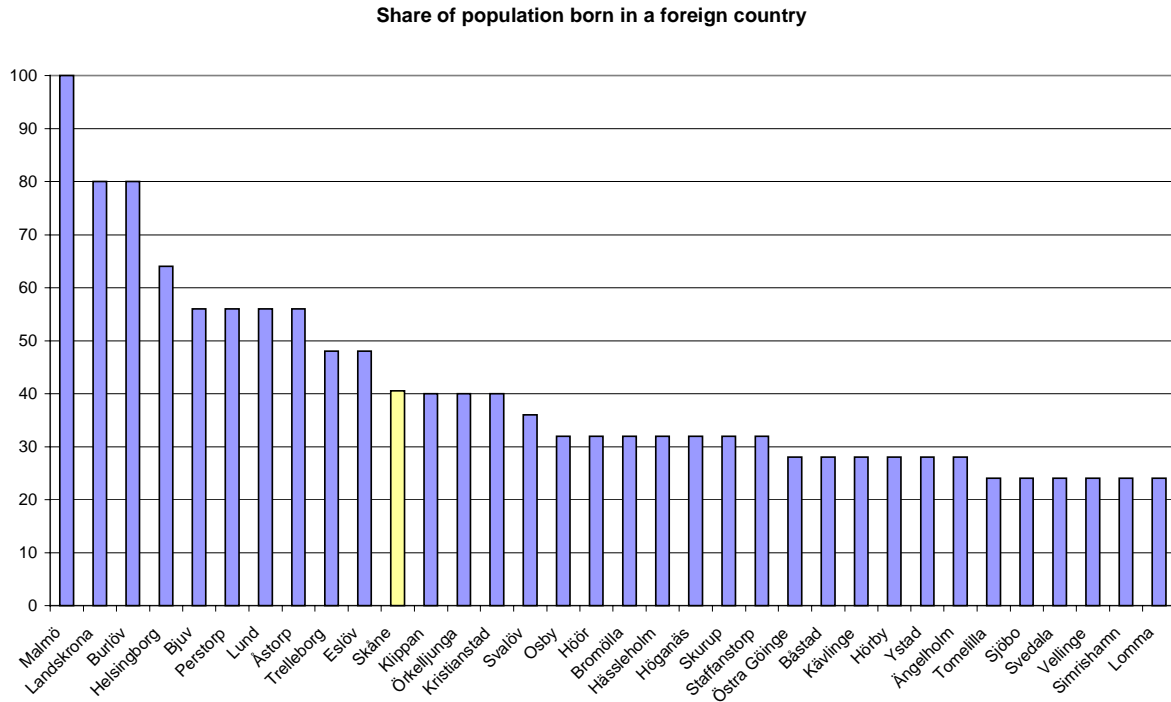


**Figure: Gay tolerance index (www.rfsl.se)**

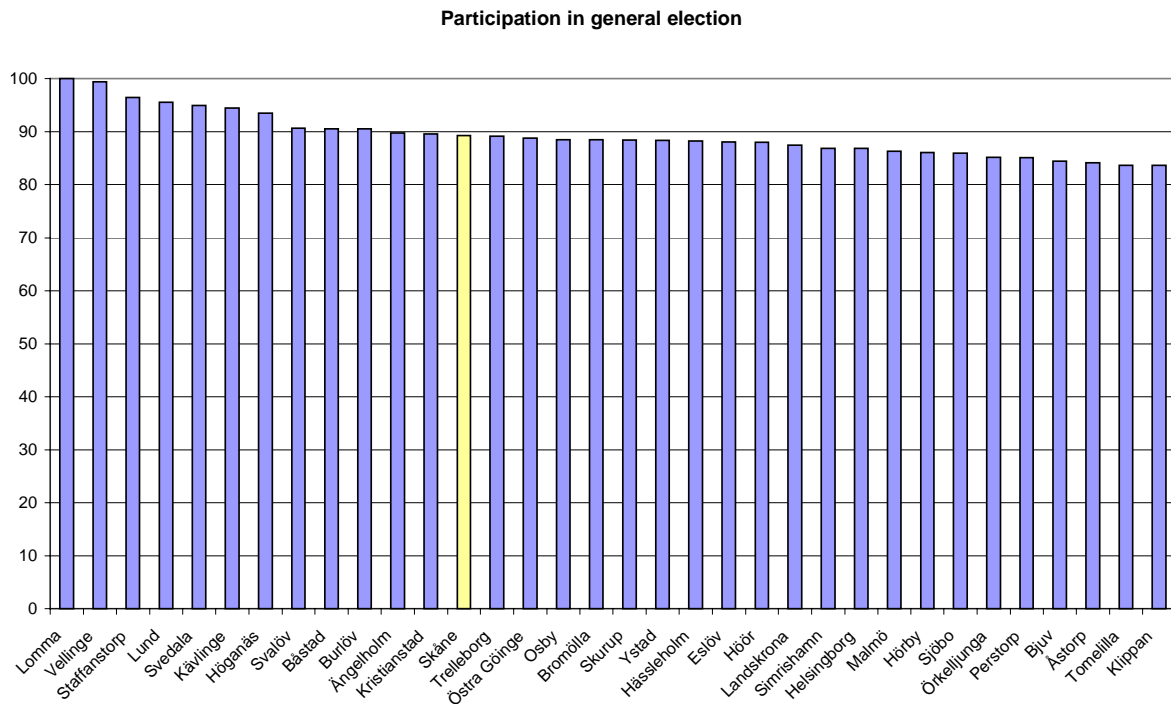


**Figure: Difference in employment level between immigrants and people with at least one Swedish parent**

(own processing; www.scb.se)

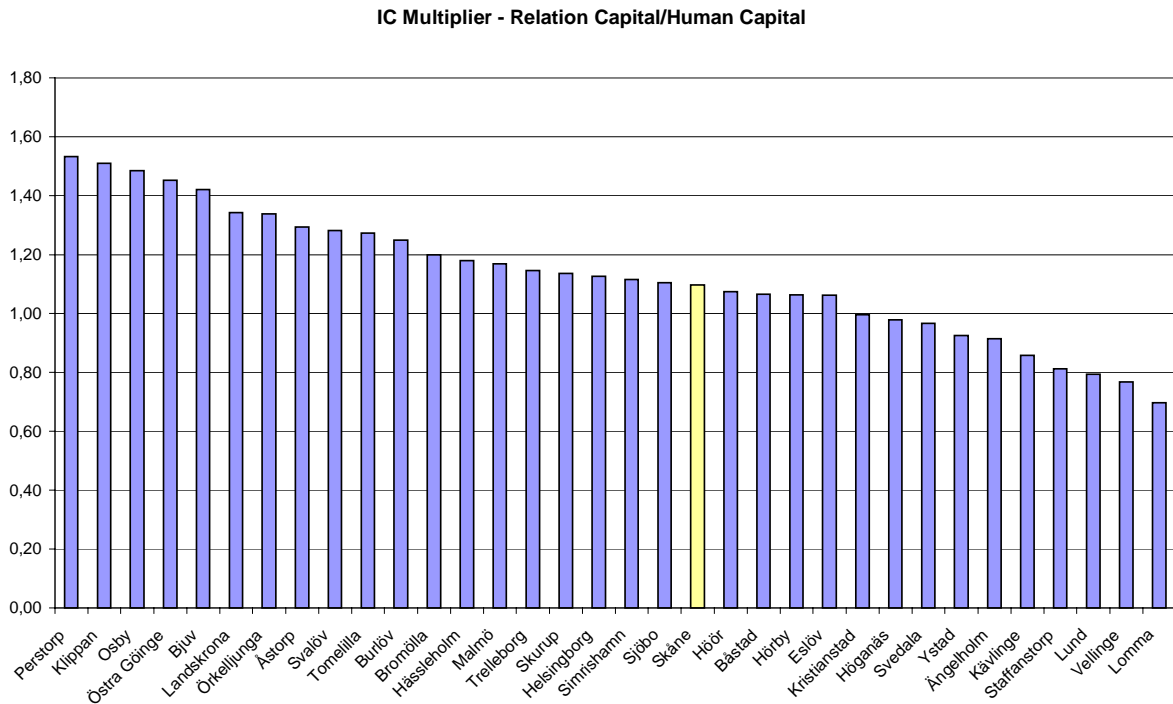


**Figure: Share of population born in a foreign country (www.scb.se)**

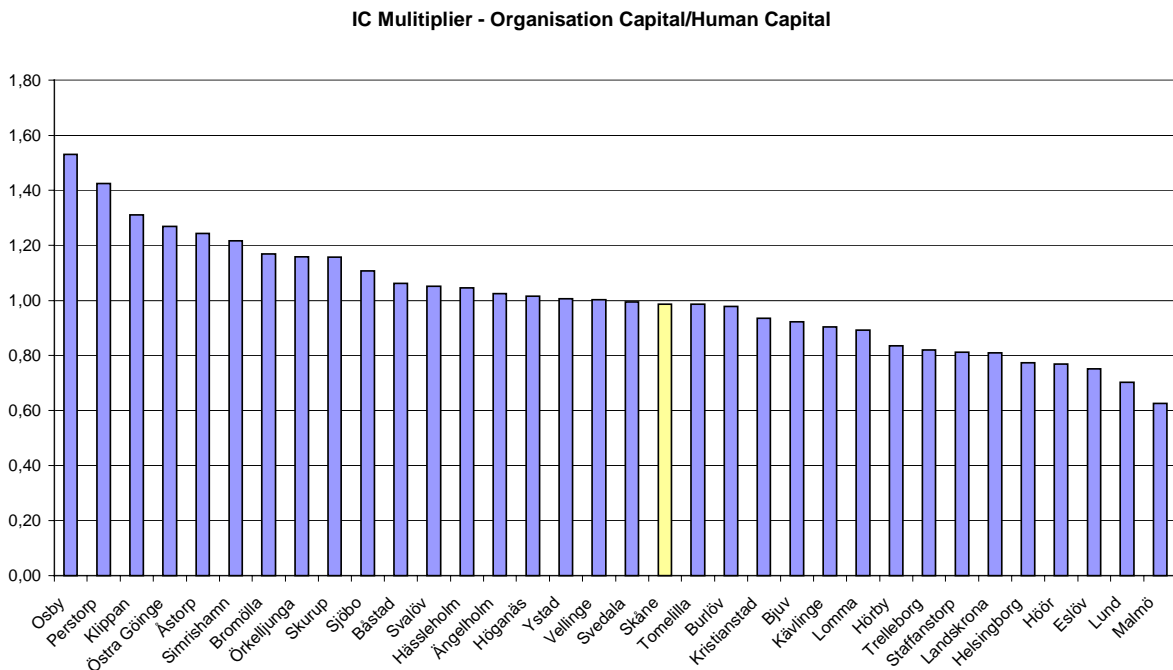


**Figure: Participation in general election (www.scb.se)**

**IC- MULTIPLIERS**



**Figure: IC Multiplier - Relation Capital/Human Capital**



**Figure: IC Multiplier - Organisation Capital/Human Capital**

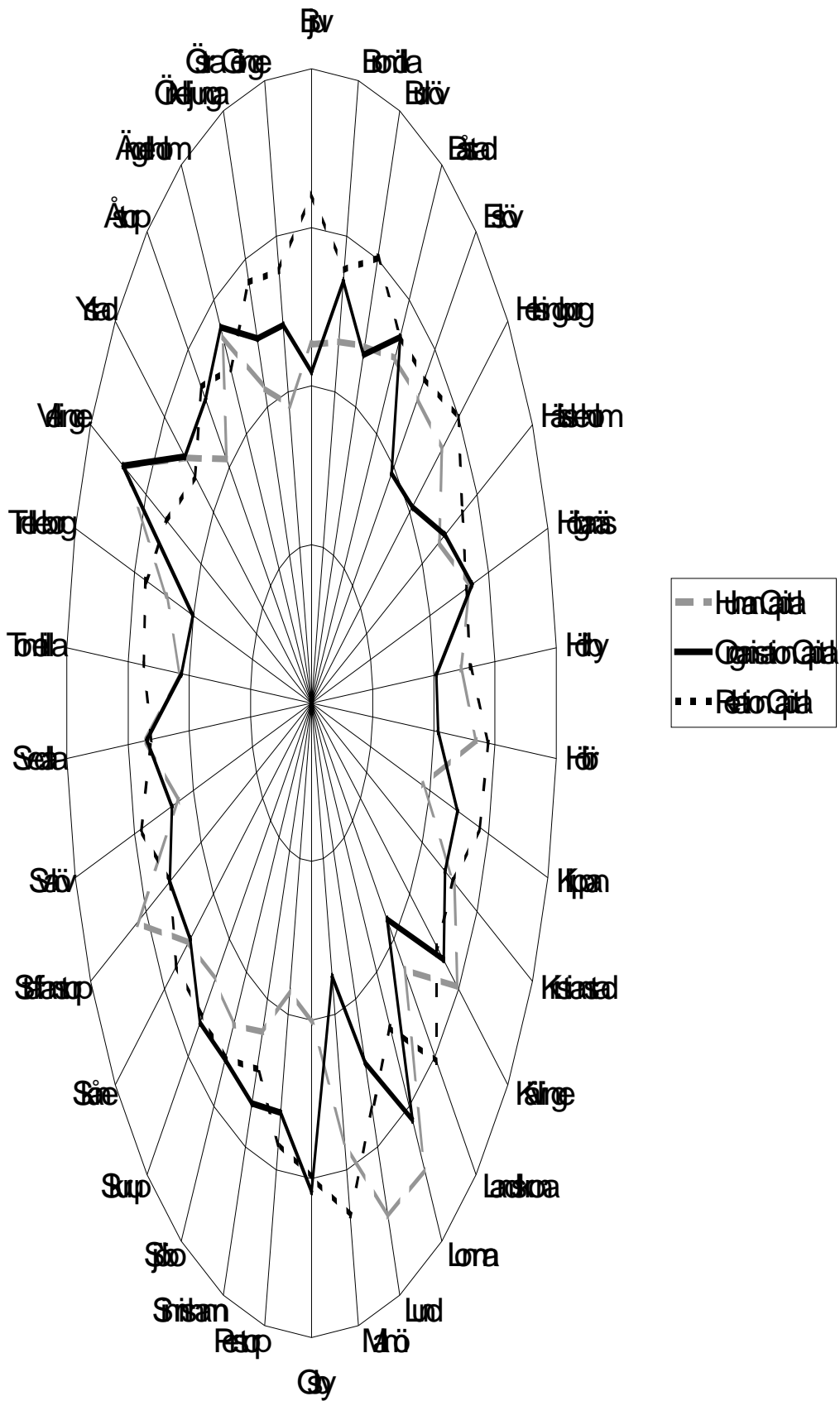


Figure: Average Intelligent Capital Index



## **APPENDIX 8: North & Kares' Ten Criteria for Ignorance versus Intelligence**

- Autism versus Openness
  - the (in)capacity to capture new ideas, trends and developments
- Blindness versus Vision
  - the (in)capacity to develop a shared vision and shared values
- Followership versus Leadership
  - the (in)capacity to motivate and lead transparent decisions towards shared goals
- Disintegration versus Cohesion
  - the (in)capacity to bridge gaps between young and old, poor and rich, locals and immigrants
- Vanity versus Self-Reflection
  - the (in)capacity to assess own strengths, weaknesses and limitations
- Abuse versus Use of competencies
  - the (in)capacity to make full use of intellectual capital in a responsible and sustainable manner
- Regression versus Learning
  - the (in)capacity to draw lessons and innovate
- Disruption versus Connectivity
  - the (in)capacity to build networks of people (communities) and use connective powers of ICT
- Lethargy versus Initiative
  - the (in)capacity to mobilise people and create a spirit of renewal
- No-risk versus Experimentation
  - the (in)capacity to try out new solutions, give freedom to play and allow errors

Source: North & Kares, 2004

**APPENDIX 9: Gross Regional Product**

Komkod	Komklar	GRP, current prices, million SEK	Average population, thousand persons	Employed, thousand persons	GRP per capita, SEK
		2001	2001	2001	2001
1281	Lund	36 560	99,3	59,6	368 177
1275	Perstorp	2 315	6,7	3,7	345 522
1272	Bromölla	3 665	12,0	4,8	305 417
1280	Malmö	79 477	261,0	147,9	304 510
1283	Helsingborg	33 184	118,1	62,8	280 982
1231	Burlöv	3 832	15,2	7,0	263 000
1290	Kristianstad	17 307	74,3	38,6	232 934
1278	Båstad	3 150	14,1	5,6	223 404
1292	Ängelholm	7 640	37,4	16,2	204 278
1286	Ystad	5 233	26,2	11,3	199 733
1260	Bjuv	2 726	13,7	4,9	198 978
1263	Svedala	3 551	17,9	6,5	198 380
1282	Landskrona	7 330	38,0	15,5	192 895
1277	Åstorp	2 434	12,9	5,0	188 682
1284	Höganäs	4 273	22,7	7,2	188 238
1257	Örkelljunga	1 718	9,4	3,5	182 766
1291	Simrishamn	3 516	19,3	8,4	182 176
1276	Klippan	2 784	15,5	5,9	179 613
1293	Hässleholm	8 691	48,6	22,0	178 827
1256	Östra Göinge	2 505	14,2	5,0	176 408
1285	Eslöv	4 969	28,6	11,8	173 741
1261	Kävlinge	4 132	24,8	7,5	166 613
1287	Trelleborg	6 403	38,5	14,1	166 312
1270	Tomelilla	2 059	12,4	4,6	166 048
1273	Osby	2 070	12,7	4,7	162 992
1233	Vellinge	4 109	30,6	6,9	134 281
1265	Sjöbo	2 224	16,7	5,1	133 174
1266	Hörby	1 835	13,8	4,1	132 971
1262	Lomma	2 404	18,1	4,1	132 818
1267	Höör	1 844	14,0	4,2	131 714
1230	Staffanstorps	2 493	19,9	4,6	125 276
1214	Svalöv	1 557	12,6	3,8	123 571
1264	Skurup	1 552	13,8	4,0	112 464
Totalt		2 266 387	8 896,1	4 345,0	254 762

**Table: Gross Regional Product 2001 (Individual Processing SCB, 2004)**