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Technology, Talent and Tolerance

- The Geography of the Creative Class in Sweden

Høgni Kalsø Hansen



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Preface

This report is part of a wider European Science Foundation research project on the creative class in a European context. The aim of the project ‘Technology, Talent and Tolerance in European Cities: A Comparative Analysis’ is to identify and compare quality of place and its effect on regional development. Especially factors that influence the attraction of high level education and highly qualified labour are of interest to this project. The project is joined by 8 European countries, Denmark, Finland, Germany, Holland, Norway, Sweden, Switzerland and UK, and is coordinated by Professor Bjørn T. Asheim at Lund University. The Swedish part of the research is funded by the Swedish Research Council. Besides comparing coexistence, quality of place and regional growth in different city regions in Europe, the project aims to compare the European results with results from similar research carried out in the USA and Canada.

This report presents results from the Swedish regions; when data are available, however, the results of the Swedish regions will be compared to other Nordic regions.

While working on the report, the author have benefited from fruitful discussions with the partners of the European project, and especially from discussions with Professor Bjørn T. Asheim and Associate Professor Karl-Johan Lundquist from Department of Social and Economic Geography, Lund University.

Lund, April 2007

Høgne Kalsø Hansen

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1. Introduction – The Theory of the Creative Class

This chapter presents and discusses the new and very influencing creative class thesis which has entered planning authorities, the political scene as well as academics working with issues of regional development. The analysis is based on ‘*The Rise of the Creative Class*’ by Richard Florida (2002), which has become very dominant in city planning both in the USA, Canada and in Europe.

As most other researchers within regional growth, Florida (2002) argues that the globalising world introduces new challenges to the production of goods in the high cost areas. Countries like Sweden cannot compete on traditional production because the production cost is relatively high compared to Eastern Europe, Asia, the Middle East or Africa. Decreasing cost in transportation along with technological breakthroughs within information and communication technologies have made traditional standardised industrial production less dependent on place and more dependent on cost. Consequently, industrial production has become more footloose. This is, however, not the case for a more knowledge intensive production.

Having acknowledged that production cost is important, it is fair to state that location preferences for knowledge intensive firms are less concerned with production cost and more concerned with variety of supplementary factors. Theorising on industrial dynamics and regional differences has showed that market, culture, geographical proximity, relational propinquity and institutional differences are important factors for knowledge based production as well. Research has shown that these factors play a crucial role for the creation of new knowledge. Further, the new technologies that new knowledge brings along are vital for the competitiveness of knowledge intensive businesses (Amin and Cohendet 2004, Grabher 1993, Gertler 1997, 2003, Maskell and Malmberg 1999).

Florida argues that the more we move into a knowledge based economy, the more important innovations become in order to maintain our current level of welfare. To facilitate a high rate of innovation, a large and constant supply of talented and creative people is required. In his thesis, Florida puts emphasis on talented and especially creative people as they use their creative mindset to solve problems in their professional occupation¹. The creative class – as Florida calls them – counts 30-45 percent of the total occupied workforce in most western countries and consists of persons in many different occupations like researchers, designers, engineers, artists, architects, leaders in businesses and in the public sector, groups in healthcare and teachers in educational institutions.

¹ A list of creative occupations can be found in appendix 1 table 1

The underlying argument in the creative class thesis is that as talents and creative people become a crucial resource for knowledge intensive production, the quest for talent and creative people increases. Contrary to traditional resources, talents and creative people are mobile. Consequently, regions have to attract and retain talents to attract businesses; firms tend to move to locations close to qualified labour rather than the creative class moving for jobs. Therefore, regional growth has become closely connected to the quality of place and thereby to factors that appeal to the creative and talented workforce.

A Theory on Regional Growth

The basic reasoning of the creative class approach is that technology, talent and tolerance are three crucial cornerstones in facilitating regional growth in the knowledge based economy. The three T's, as they are often referred to, are regarded as interconnected parameters which individually have a positive but limited influence on growth; however, in coexistence they have a significant synergic effect. Florida 2002 puts it this way 'Each is a necessary but by itself insufficient condition: To attract creative people, generate innovation and stimulate economic growth, a place must have all three.' (p. 249)

Florida acknowledges the numerous different explanations of regional growth, which can be found within the field of regional economics and economic geography. Especially Glaeser is credited for his human capital perspective, which argues that a high concentration of highly educated people propels regional growth (Glaeser 1994, 1998). The creative class thesis argues that not only educated people are necessary to promote regional growth – other parameters are of high importance too. 'Regional economic growth is powered by creative people, who prefer places that are diverse, tolerant and open to new ideas' (p. 249); accordingly, a talented workforce and a base of economic activities are important for regional growth only in combination with a tolerant open-minded and diverse climate. Adding tolerance to well-known parameters of economic growth is perhaps the most innovative part of the creative class thesis. By doing so, the approach puts focus on aspects that has to do with the wellbeing of the labour force.

In the creative class approach, technology is understood as high-tech industries, and talent is viewed as formally educated persons as well as talented people working within specified occupations – we will return to these definitions at a later stage. The interrelation between technology and talent has been identified by Glaeser (1998, 2003), among others. The creative class approach specifically points to the connection between clusters of educated and talented people and to concentrations of innovation and high-tech economic activities. Hence, two of three central elements in facilitating regional

growth are the presence of a talent and a high-tech base according to the creative class approach – two parameters that are often pointed to in research on regional growth.

Tolerance, the third parameter, covers a broad range of elements that influence the milieu and atmosphere of the city. Most importantly, tolerance has to do with low entry barriers. Cities not only grow due to birth rates; attraction of talented and creative people is essential too. Therefore, low entry barriers such as openness toward newcomers and open-mindedness toward different cultures and different norms may help regions in the competition for talent. This is partly because open-mindedness makes it easier for foreigners to relocate, and partly because people deviating from the norms can be very innovative.

The line of reasoning is put into schematic form in figure 1.1

The figure illustrates the interconnection of the three T's in the creative class approach. As the model shows, the three T's are all equally related. In theory, the three T's are equally important, and only by combining the three will competitive, attractive and creative regions emerge.

One of the assumptions of the creative class approach is that people within creative occupations base their values on similar grounds and are attracted towards the same type of places. The values that attract and are treasured by talents are openness, diversity etc.; all elements in the tolerance bubble in figure 1.1. In addition to attracting and retaining talent, a tolerant and diverse environment also brings along a higher rate of innovations and thereby becomes supportive to the technology base in the region. This is due to a high tolerance level providing space for people who act and think differently. These people often introduce an outrageous idea, which eventually becomes possible or at least gives birth to other ideas. Therefore, people who think differently are often valuable in generating innovations.

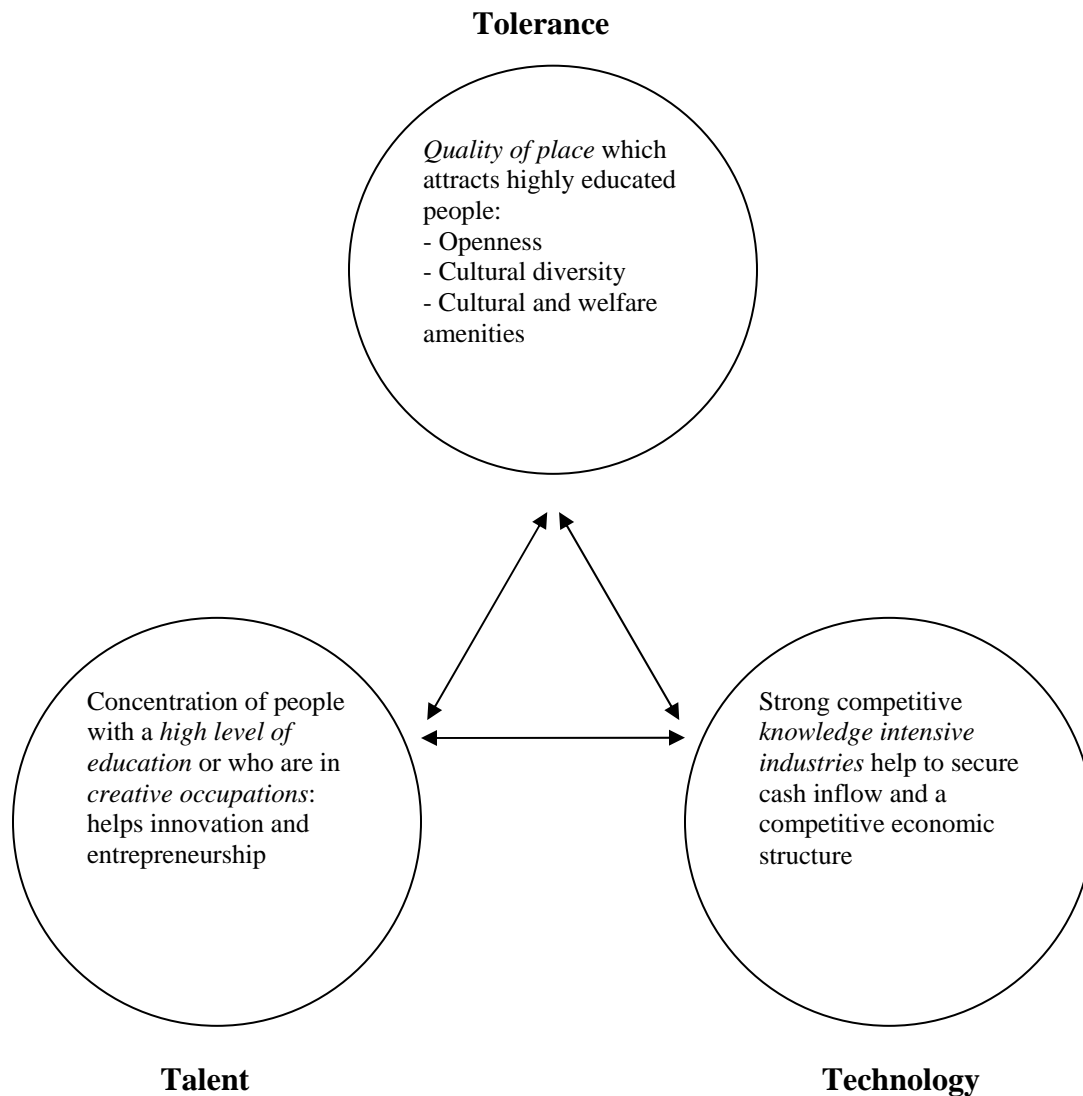


Figure 1.1: Simplified model of the relationship between technology, talent and tolerance (Source: Inspired by Isaksen (2005))

Business Climate versus People Climate

An important point in the creative class approach is that knowledge intensive businesses move to regions with high shares of talented and creative workforce, and that creative people tend to gravitate toward places with certain qualities. This asks for new regional policies to complement the traditional focus on business climate with a people climate angle. People climate can be seen as a set of ingredients that spice up the city and make it attractive for the creative class. Especially the tolerance variables are of importance; however, all three bubbles in figure 1.1 affect people climate. If a good people climate is not present, the creative class will move on to new places.

It is important to bear two things in mind when dealing with the creative class theory. Firstly, the creative class is assumed to be extremely mobile and to put individual needs first; hence, they will move from region to region if their needs are not fulfilled. In Sweden and in the Nordic countries in general, the degree of mobility is, however, not comparable to the North American counterpart – social constraints are generally higher and the social welfare system does not force people to move around in search for jobs to the same extent as the lack of social security in North America does. Secondly, the creative class thesis is developed in a North American context; therefore the number of cities to move between is much higher, and the intercity competition on the national level is much more distinct.

In respond to the high mobility of the creative class people, regions have to provide a good people climate to facilitate a good business climate. This is the result of several studies performed by Florida and his colleagues. By studying trends in regional development, they found that though some regions have universities, and thereby a potential pool of well-educated people, and have facilities to start up businesses, they are not always able to stimulate growth. An important explanation shall be found in the absent of attractive a people climate, which causes a flight of talented and creative people. Consequently, potential talent and a good business climate are not sufficient to bring growth to a region – attracting and not least retaining creative people are just as important aspects (Florida, 2002).

There is, however, a fine line between creating an attractive people climate and creating a safe community. Putnam's social capital concept (1993) is based on civicness where, pushing to extremes, everybody looks out for everybody. According to Florida, this does not appeal to the creative class people². On the contrary, the stereotype picture of the American suburb with hundreds of houses looking alike, occupied by people with the same skin colour, within same social class and with same religious and cultural belongings kills creativity. The lack of diversity in these suburbs results in closed communities that are difficult to enter for newcomers and provides extremely limited space for people who think differently. Thus, providence of safe communities with good schools etc. can, on the one hand, lead to an attractive people climate. However, without diversity in terms of culture, social class etc. these elements can have the opposite effect.

² Florida's reference to Putnam's work suggests an understanding of social capital as bonding, i.e. rooted in civicness. However, social capital can also be considered as 'bridging'. As such it can co-exist with weak ties as this form of social capital is a result of organizational and institutional innovation on the societal level (e.g. labour market collaboration and legislation in the Nordic countries).

Critique on the Creative Class Approach

While having a massive success within bodies that practise regional planning, Florida's thesis has met serious critique in academic circles, including Malanga (2004), Törnquist (2004) Gibson and Klocker (2005) Scott (2006), Boyle (2006) Rausch and Negray (2006). Among the most well argued ones, we find Glaeser (2005), Markusen (2005), Peck (2005) and Hansen et.al (2005). In the following, we will present and discuss the critique that has been raised toward the creative class approach. By doing so, we also elaborate on areas of the thesis that need to be re-theorised.

Human Capital versus creative capital

Glaeser is a strong advocate of the human capital thesis. His basic argument is that Florida gives the creative class credit for causing regional growth, although, in reality, it is the highly educated workforce that brings regional growth, according to Glaeser. Glaeser touches upon one of the more loosely defined concepts of the creative class thesis, one that can easily cause confusion. The human capital perspective that Glaeser represents sees the educational level of the workforce as a key to understand regional growth. Florida on the other hand uses the concept of talent for the same group of people (Florida 2002 p. 333), but he also uses the same term to cover people with creative occupations (Florida, 2005b p. 51) - and some times both for human capital and creative occupations. Consequently, a rather confusing use of the term talent makes Florida's concept and thus theorising diffuse and misleading. Therefore, in the following discussion Florida's talent concept will be used as if it covers people in creative occupations³. Subsequently, the concept covers a larger number of people than the human capital group as defined by e.g. Glaeser.

Glaeser argues that strong correlations can be found between location of human capital and regional growth. Basically, the significant difference between Glaeser's human capital thesis and Florida's creative class thesis is that the creative class thesis assigns equal importance to other variables than talent when explaining regional growth. Glaeser most likely includes people who are highly educated but are occupied within non-basic jobs, e.g. waitresses. In our point of view, this is a simplified and narrow perception of resources. On the other hand, Florida includes creative workers without formal education, but he most likely also includes people who statistically are within a creative occupation, but do not necessarily perform creative work, e.g. certain jobs within public services as well as certain jobs within the financial sector. Analysis of the following chapters will show that the creative class in Sweden only consists of 40% of people with a formal university degree equal to or above bachelor level. Hence, Glaeser (2005) might focus

³ In chapter 3 a talent index is introduced. The index is measured by educational level and hence equal to Glaesers human capital concept.

too much on education and too little on other influencing variables such as job functions. It is important, however, to state that the majority, 80%, of the highly educated workforce is occupied in the creative occupations as defined by Florida.

In his formalised critique, Glaeser (2005) makes strong arguments based on data material. He points to black holes in Florida's creative class thesis. According to Glaeser's statistical findings, population growth has a stronger influence on talent than indicators of tolerance, creativity and innovation. On the other hand, Glaeser only discusses creative people as the creative core⁴, which to a large extent equals the majority of human capital. Accordingly, he does not discuss the creative class in regard to the overall creative class as Florida does. While Florida's creative class population counts for approximately 35% of the workforce in most western countries, Glaeser's population for his analysis is considerably smaller as he only includes the creative core of Florida's definition. This is one of the key differences between the two.

By running regressions with the same data that Florida & Knudson (2004) do, Glaeser finds a positive correlation between cities with growing populations and concentrations of highly educated people, which indicates that expanding cities are more capable of creating conditions for economic growth. On the other hand, Glaeser finds no important correlations between population growth and the Patent Index, the Gay Index and the Bohemian Index – some of Florida's indicators of creativity, innovation and tolerance. These indexes all have a small impact on population growth compared to talent.

One argument that favours Florida's creative class population is that creativity is not something that can only be learned in school. Especially the group of creative professionals counts people that are not necessarily highly educated but may have worked their way up or are gifted with a talented or creative mindset. Therefore, when Glaeser chooses only to look at the creative core in his analytical critique of Florida, he might only get half the story. Glaeser's critique must be taken very seriously. When analysing the influence of technology, talent and tolerance on regional economic growth, it is important to control for human capital and the influence of human capital. We, however, also wish to point to the fact that population growth, which Glaeser uses as a proxy of economic growth in his analytical critique, is only one of several proxies on economic growth. Hence, we find that Glaeser's critique would benefit from taking a broader theoretical perspective by including more than only human capital.

⁴ The creative class is by Florida divided into two sub-groups: the creative core and the creative professionals, where the creative core is considered the most creative one. The relation between the two groups will be discussed in chapter 3, see also table 1, appendix 1.

All this said, the Swedish data shows a strong correlation of 0.935 when educational level is correlated with the creative class. Consequently, creative class and talent can substitute each other in Sweden – as will be the case later on in this report. This high correlation can be seen as supporting Glaeser's argument – that human capital is the driver of economic growth in a Swedish context. On the other hand, this is only the findings of Sweden. In Finland we get a higher correlation (0.96), but in Denmark and Norway the correlations are respectively 0.84 and 0.85 (Andersen et.al., 2007), and there is no reason not to expect that the correlations are even lower in other countries. Accordingly, while the difference in the correlation between the creative class and human capital in Sweden is only 0.065 point, the difference is 0.16 points in Denmark – a notable difference that legitimate openness towards a possible effect of a creative class that differs from the effect that human capital can have on regional development. If we take a regional view, there is a good reason to believe that significant differences can be found here. Pooling data from Denmark, Finland, Norway and Sweden actually show a correlation between talent and the creative class of 0.34, an indication of notably differences across national borders.

The Fuzzy Concept of the Creative Class

Markusen (2005) raises a critique of Florida and his creative class thesis. Besides sympathising with Glaeser (2005), Markusen's main critique is that Florida's creative class concept reduces creativity to certain occupational groups. Markusen states that creativity is a fuzzy concept – a statement with which we can hardly disagree. Markusen also claims that Florida – possibly unwillingly – conflates creativity and educational level by using census data on occupation uncritically. To Markusen, home care workers, criminals and repair people and technicians etc. are creative as well. Therefore, it is problematic to restrict creativity to statistical nomenclatures, and, consequently, Florida ends up doing regressions on a population that is far less creative than Florida believes them to be.

We agree with Markusen that it is difficult to place creativity in occupational categories. Likewise, education is not a guarantee for a creative mindset. Repairmen, carpenters, criminals etc. can be just as creative as highly educated people. However, to base theoretical arguments on statistical findings will always result in generalisations and loss of details. This is sometimes necessary to make a strong case – as long as it is academically honest. To us, this is what Florida does. We are also sceptical of some of his choices of statistical codes and maybe more critical of some of the occupational groups that are not included as creative. On the other hand, we recognise the need to reduce and simplify complexity in order to make a statement.

Lastly, Markusen (2005) points to the correlations between educational level and the occupational groups that Florida defines as creative. This might very well be the case in the USA, and if so, it is a problem. Data from Sweden – which will be presented below – shows that though most persons with university degrees in Sweden are included in the creative class, they only count for 40% of the total creative class. This leaves 60% of the creative class people with an educational degree lower than bachelor level or of non- or semi-academic origin. Therefore, the close correlation between education and the creative class, which may apply to the USA and Sweden, can show to be less influential in the other cases⁵.

The Problem of Policy Making

Thirdly, we turn to the critique of Florida's creative class which is raised by Peck (2005). Peck points to three problems that public policy makers will face if they try to implement strategies based on the creative class approach. First of all, cities will compete for the same hyper mobile talented workforce and will probably end up implementing the same political initiatives. Successful strategies have been and always will be subjects to imitation and adoption. Cities cannot be expected to invent the wheel every time new political actions have to be taken. Obviously, it is a problem that many cities implement the same type of strategies. Hopefully, many of the cities manage to give city strategies a local touch, but strategies are often implemented as a respond to a contemporary mismatch between the present strategies and the economic reality. Hence, strategic answers to potential crises will often reflect the current economic flows.

Secondly, Peck (2005) notes that competition for creative people will bring focus on creating attractive neighbourhoods for the individuals who constitute the creative class. Additionally, focus will be removed from local challenges such as large and growing socioeconomic inequalities.⁶ This is a major concern, and to us, it is highly relevant to question whether focus on creativity can have consequences for segmented and non-creative groups in society. One scenario is that the gentrification of urban areas, which many cities are facilitating, pushes away socially and economically marginalised groups without providing alternative housing. This has two consequences. Firstly, the marginalised group becomes a group that nobody wants to take co-responsibility for, and, in extremes, they become refugees in their own regions. Secondly, by pushing away the marginalised groups and gentrify large urban areas, cities can lose some of the originality that makes them special and attractive to the creative class. This is an important problem

⁵ Here it has to be stated that the system of education is organized and structured in considerably different ways around the world. This often results in problems of measuring differences and similarities when results are compared across countries.

⁶ The potential social segregation and inequality that the knowledge based economy can bring along is shortly addressed by Florida in his preface of the paperback edition of *The Rise of the Creative Class* (2002 [2004]).

in Florida's theorising. Creating attractive physical space for the creative class can easily result in a destruction of one of the crucial elements in the approach – the presence of diversity. Therefore, planning policy has to be double-sided: On the one side, attention must be paid to attracting and retaining the creative class; on the other side focus must be given to retaining some of the authentic urban milieus.

Thirdly, Peck (2005) argues that street-level culture and renewed buildings might be just as much a consequence of economic growth as a cause of it. This is essential for the validity of the creative class approach if the approach should be seen as a development strategy instead of a survival strategy for already creative cities. Which came first – the chicken or the egg? Indications of this may be obtained from checking data for controlling variables or run long time series. Other indicators may emerge from interviewing creative class people, and investigate their moving patterns and their preferences. All put together, this can help clarify the picture of contingencies and necessities in regional development. In the end, however, what to assign the cause or the effect can be reduced to a matter of belief by the investigating part.

The Knowledge Base Approach

Lastly, we turn to the critique raised by Hansen et.al. (2005). Hansen et.al. points to the problem of bundling up 35% of the population and claim that they have uniform interests and preferences, a problem that Markusen (2005) addresses. To approximate a more diverse understanding of the creative class and its role in regional planning, we need to unpack, reflect on and re-theorise parts of the approach. In many cities, suburban areas are densely populated with engineers, teachers, civil servants etc. while down town areas attract artists, people in advertising and in general apply to a younger segment. Hence, several groups of creative class people with very different preferences can be detected both in regard to occupation and age.

To come to a better understanding of the diversity of preferences that different groups of the creative class represent, Hansen et.al. (2005) argues that the creative class thesis can gain from adding a knowledge base framework (Asheim & Gertler 2005, Asheim et al 2007). In its most simple form, the knowledge base approach divides knowledge into three categories. Each category is an ideal type and each covers an area of knowledge that is drawn upon in production of goods and services. The analytic knowledge base refers to industries where scientific knowledge is highly important and where knowledge creation is based on cognitive and rational processes. Typical industries that draw on the analytic knowledge base are biotech and nanotech. The core of the workforce needs research training or university training, and, hence, the industries are often located close to universities. The synthetic knowledge bases refer to activities where innovation mainly takes place through application of existing knowledge or by new combinations of existing

knowledge. Typical industries are plant engineering, specialised advanced industrial machinery and production systems etc. The synthetic knowledge workers need know-how, craft and practical skills, and, hence, these industries are often co-located with polytechnic schools. However also a large share of on-the-job training and path dependency have an impact. The symbolic knowledge base is related to the aesthetic attributes of a product addressing design, image etc. Activities are design and innovation intensive, and a change from use-value to sign-value can be seen in capitalist consumption (Asheim et.al., 2007; Lash & Urry, 1994). Industries drawing upon the symbolic knowledge base tend to be situated in larger city regions where multi cultural impressions are often concentrated.

Hansen et.al. (2005) argues that each of the three knowledge bases asks for different combinations of business climate and people climate. People drawing upon the synthetic knowledge base are less in need of people climate elements than people drawing on the symbolic knowledge base. Symbolic knowledge base workers often need e.g. cultural, political diversity for inspiration – synthetic knowledge base workers are less dependent on an urban rhythm. Consequently, regions that face significantly higher concentrations of symbolic knowledge base workers should focus more on people climate parameters than regions that are more dependent upon the synthetic knowledge base. The latter group should put more interest on business climate parameters.

Adding this perspective to the creative class thesis provides analysts and policy makers with a more diversified tool when discussing the creative class and regional development – especially when planning authorities add a people climate perspective to the regional planning. The approach still needs to be developed thoroughly, but diversifying the creative class gives a promising analytical tool and makes the creative class thesis more adequate for the diverse nature of the economic and regional landscape.

Summing Up

Summing up, this chapter has examined some of the central facets of the creative class approach and pointed to some of the critical aspects of it as well. The creative class thesis argues that technology, talent and tolerance are three interrelated parameters which in combination provide a promising base for economic growth. The existence of a business climate and especially a people climate is necessary to propel the three T's and thereby regional development, see figure 1.2.

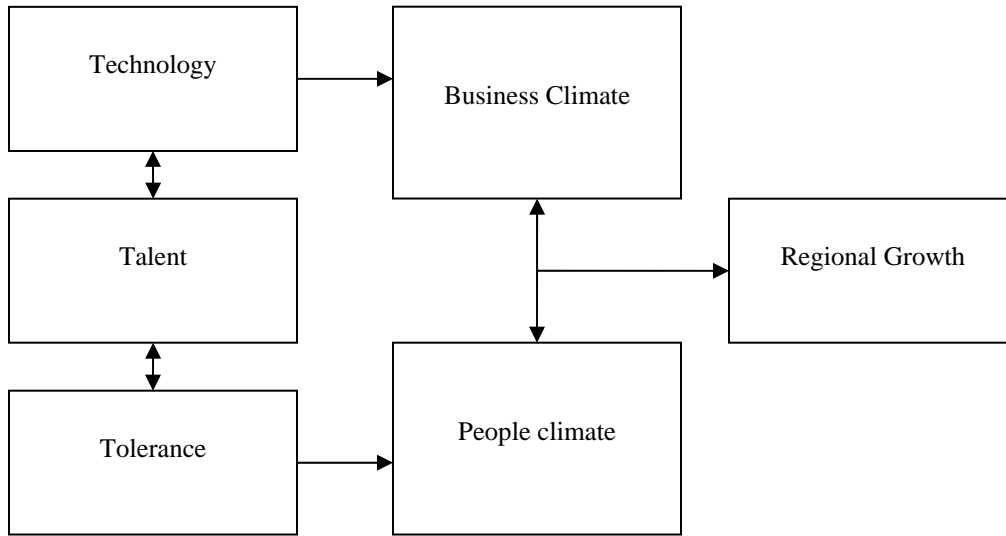


Figure 1.2: The relationship between different variables and regional growth according to the creative class thesis.

Now we will move on to analysing the relationship between the factors presented in figure 1.2 in a Swedish context. First, we will present the central research questions and the methodological approach which have structured how we address these questions. Next, we will give a statistical characteristic of the creative class. Subsequently, a presentation follows of the geography of technology, talent and tolerance, quality of place and entrepreneurship in Sweden. These findings allow us to rank the Swedish regions in regard to these indicators. Finally, we will exploit a multivariate model, which analyses the correlation between the above-mentioned variables and regional growth in Sweden.

2. Research Questions and Method

This report is an outcome of the research performed in a European comparative study. Eight different countries are represented in the project, and, hence, at least eight different statistical bureaus are applied as data sources. Different ways of gathering data, different definitions and different nomenclatures are all elements that must be taken into account when data is selected.

This analysis will be the Swedish contribution to a trans-European research project, and therefore the prime goal is to present findings that are comparable with findings of the other research teams.

The aim of the analysis is to identify possible relations between the creative class and regional growth. To do so, we have formed three central research questions:

- Where is the creative class located in Sweden?
- What types of variables influence the location of the creative class?
- To what degree does the presence of a creative class influence regional growth?

To answer these questions, we use register based statistical material. Indicators of technology, talent and tolerance as well as indicators of quality of place and entrepreneurship will be discussed when data is presented.

We are well aware of the limitations of using register based statistics. Applying this type of statistics is an excellent tool to give characteristics of certain phenomena and to show linkages between different variables. It is an important help in identifying areas of particular interest – areas that could easily have been unnoticed without the ‘big picture’ provided by the register based statistics. However, to identify causality by using register based statistics alone is very difficult. Statistics do not give any final answers to causalities. Why does A lead to B, and could A possibly also lead to C? These types of questions are difficult to answer by using quantitative sources alone. Instead, this information has to be gathered through qualitative methods such as interviews. Subsequently, the combination of qualitative and quantitative methods gives a promising framework for an in-depth analysis of different phenomena.

The ongoing research project ‘Technology, Talent and Tolerance in European Cities: A comparative Analysis’ aims to combine these two methods of collecting data. This report is the quantitative part, which will give a general picture of the creative class and the parameters that are said to influence its location. Besides providing us with a general

picture, this report will help to identify areas that will be addressed in an interview survey, which has been carried out throughout 2006.

A central aspect of the following analysis is the selection of indicators of technology, talent, tolerance, quality of place and entrepreneurship. In some cases, e.g. in regard to technology and talent, we have adopted Florida's (2002) considerations. We have, however, adapted the definitions in order to adjust them to the European context. For example we have added knowledge intensive business services to the High Tech Index. Especially indicators of tolerance have given us many headaches. The Gay Index, one of Florida's tolerance measures, is a poor measure in Europe because being gay is not as controversial as in the USA. Furthermore, the data is poor. Instead we have developed new indexes such as the Integration Index, which can be seen as a kind of integration measure investigating the relation between foreign and Swedish employment rates.

In general, the central consideration has concerned the differences between an American and a European/Swedish context. The creative class thesis was developed within the United States. The USA contains a far higher share of large cities and city regions than Sweden. Moreover, the American population is more mobile than the European. All together, this results in much more competition between cities. Sweden only consists of three cities that are fair to count as large cities – namely Stockholm, Gothenburg and Malmö. Hence, we decided to include all the Swedish labour market regions in the analysis. However, to reduce specificity, we only present data for the 25 labour market regions that counted more than 100,000 people in 2002. Table 2.1 shows the population of the 25 largest regions in 1993, 1997 and 2002, and the growth in population from 1993 to 2002.

Table 2.1: Population and percentage changes in the city regions in Sweden 1993, 1997 and 2002

| City region | 1993 | 1997 | 2002 | Absolute change 1993- 2002 | Percentage growth 1993-2002 |
|------------------------|------------------|------------------|------------------|---|--|
| <i>Sweden</i> | <i>8,745,109</i> | <i>8,847,623</i> | <i>8,940,788</i> | <i>195,679</i> | <i>2.24</i> |
| Stockholm/Södertälje | 1,636,828 | 1,711,657 | 1,796,765 | 159,937 | 9.77 |
| Gothenburg | 794,274 | 824,068 | 856,367 | 62,093 | 7.82 |
| Malmö/Lund/Trelleborg | 490,340 | 510,085 | 532,674 | 483,640 | 8.63 |
| Helsingborg/Landskrona | 227,733 | 231,319 | 235,945 | 8,212 | 3.61 |
| Uppsala | 200,602 | 208,091 | 214,086 | 13,484 | 6.72 |
| Borås | 193,475 | 192,525 | 193,298 | -177 | -0.09 |
| Örebro | 179,357 | 182,699 | 185,223 | 5,866 | 3.27 |
| Gävle/Sandviken | 177,133 | 175,293 | 173,572 | -3,561 | -2.01 |
| Karlstad | 176,602 | 174,995 | 172,709 | -3,893 | -2.20 |
| Norrköping | 166,996 | 167,804 | 166,750 | -150,321 | -0.15 |
| Linköping | 151,846 | 154,779 | 156,967 | 5,121 | 3.37 |
| Borlänge/Falun | 159,405 | 158,624 | 156,375 | -3,030 | -1.90 |
| Västerås | 149,472 | 150,595 | 154,095 | 4,623 | 3.09 |
| Jönköping | 143,025 | 144,761 | 147,892 | 4,867 | 3.40 |
| Växjö | 141,356 | 141,220 | 140,420 | -127,314 | -0.66 |
| Umeå | 131,393 | 136,413 | 138,313 | 6,920 | 5.27 |
| Uddevalla | 130,621 | 130,016 | 129,865 | -756 | -0.58 |
| Östersund | 136,073 | 133,143 | 127,947 | -8,126 | -5.97 |
| Sundsvall | 125,784 | 124,434 | 121,984 | -3,800 | -3.02 |
| Kalmar/Nybro | 122,491 | 122,294 | 121,512 | -979 | -0.80 |
| Eskilstuna | 118,274 | 117,230 | 120,104 | 1,830 | 1.55 |
| Halmstad | 116,175 | 117,560 | 119,736 | 3,561 | 3.07 |
| Trollhättan/Vänersborg | 118,162 | 118,156 | 118,627 | 465 | 0.39 |
| Luleå/Boden | 106,958 | 107,318 | 106,189 | -769 | -0.72 |
| Kristianstad | 100,762 | 100,762 | 101,060 | -90,656 | 0.30 |

After this short introduction to the central research questions and some of the methodological considerations that structure this report, we will now turn to the analytical part.

3. Location of Talent and the Creative Class

In political debates, in the media etc. the creative class is often characterised as faceless café latte drinking hipsters, riding mountain bikes and running on rollerblades in their spare time. Consequently, planning authorities often discuss development of cultural amenities as a crucial element for attracting the creative class. Florida's study, however, shows that the creative class counts approximately 30% of the occupied population in North America. Hence, to believe that such a large group can be satisfied by drinking café latte while riding the mountain bike to work and by having access to an opera house on the waterfront is somehow naive. Being such a large group of people includes a diversity that cannot be boiled down to such a poor essence. Therefore, before going into an analysis of the location of talent and of the creative class in Sweden, we will present a brief description of the Swedish creative class based solely on register based data – being aware of the limitations that this brings.

To Florida and his supporters the creative class is seen as the backbone of economic growth. Creative workers are a broad range of people, not categorised by their level of education or what industries they are employed in but by their occupational functions. Following the creative class approach, the ability to attract and retain creative class people is crucial in the interregional competition.

Alongside, talent is important for understanding the potential development in a region. If the workforce is not matching the needs of a highly profiled knowledge based production, then, strategically, focusing on developing the production would be meaningless. Hence, geographical concentration of talent and creative class people becomes extremely interesting when analysing future economic growth.

In general the creative class is approached as one group. However, to reinforce the concept, it is sometimes meaningful to distinguish between different subgroups within the larger group. A distinction can be helpful when detailed analysis is necessary to get to an understanding of specific dynamics in a bounded area. Hence, in this report in addition to using the term creative class, we also divide the creative class into the two subgroups creative core and creative professionals, in order to get a more nuanced understanding of the geography of the creative class and its influence on regional development.

Creative core people can be understood as people who are 'fully engaged in the creative process' (Florida 2002, p. 69). They produce new forms or designs that are readily transferable and widely useful on a regular basis. The other group of creative people is called creative professionals. They work in a large range of knowledge intensive

industries. Creative professional people ‘engage in creative problem solving, drawing on complex bodies of knowledge to solve specific problems’ (Florida 2002, p. 69).

The creative core counts the most creative and innovative occupations. It consist of architects, researchers etc. and is believed to be a group of persons that create new ideas and new knowledge in their everyday work life. In contrast, the creative professionals, counting management occupations, legal occupations etc, are believed to be only partly dependent on their own creation of new ideas and new knowledge because a large part of their work also consists of more routine based practices. The occupational functions that divide the two groups are listed in the appendix 1, table 1, based on the Swedish nomenclature for occupational functions – SSYK.

We also decided to differ between the creative class people and non-creative people. As argued in chapter 1, we do not totally agree on Florida’s distinction between occupational groups that are creative and groups that are not. Therefore the term non-creative might be inappropriate and misleading. It does, however, refer to what the category holds – a group of people not occupied within Florida’s definition of the creative class. Accordingly, we use the label of the category, underpinning that we do not want to offend anyone by categorising them as notorious uncreative.

Table 3.1: Creative class vs. non-creative class - age groups⁷ (2002)

| | Creative class (%) | Non-creative class (%) |
|-------|---------------------------|-------------------------------|
| 19-29 | 11.9 | 24.6 |
| 30-49 | 53.7 | 47.2 |
| 50-64 | 34.4 | 28.1 |
| Total | 100 | 100 |

The creative class member is older than the average of the non-creative occupied person in Sweden, table 3.1. The explanation for this shall be found in the educational data in table 3.2. Here it is clear that the creative class counts for a higher share of persons with especially an academic degree. Obviously, this increases the average age as the highly educated people enter the labour market at a later stage than people with a lower level of education. Based on the discussion earlier in this chapter, it is important to point to the fact that the average educational level for the creative class is actually significantly higher than for the non-creative people; therefore the rollerblade image of the class is most likely inappropriate – especially when it comes to city planning actions.

⁷ To be able to compare the data between the different partners in the research project, we have limited the population to only counting people of the age of 18 or older when we look at employment (NACE/SNI) and 18-64 when looking at occupation (ISCO/SSYK).

The higher educational level of the creative class members can be explained by the definitions of the creative occupation. However, the data below shows that the creative class does not solely consist of highly educated people. On the contrary, table 3.2 shows that 58.8% of the people that are occupationally defined as members of the creative class do not have a university degree below bachelor level.

Table 3.2: Creative class vs. non-creative class - educational levels (2002)

| ISCED 97 | Creative class | Non-creative class |
|--|----------------|--------------------|
| Primary level of education | 1.5 | 7.4 |
| Lower secondary level of education (2A, 2B and 2C) | 3.0 | 13.9 |
| Upper secondary level of education (3C) | 14.6 | 38.3 |
| Upper secondary level of education (3A) | 15.4 | 24.5 |
| Post-secondary, non-tertiary education (4) | 9.5 | 3.9 |
| First stage of tertiary education (5B) (practical and theoretical mix) | 13.7 | 5.6 |
| First stage of tertiary education (5A) (totally theoretical) | 38.4 | 5.9 |
| Second stage of tertiary education (leading to an advanced research qualification) (6) | 2.6 | 0.1 |
| Unknown | 0.2 | 0.3 |
| Total | 100 | 100 |

This leads back to the critique by Glaeser (2005) who basically argues that human capital rather than creative capital is propelling regional growth. The Swedish data shows that though the creative class holds a larger share of human capital than the non-creative class (about 7 times as high), it is still ‘only’ 41% of the total group that have a formal university degree equal to or above bachelor level – 59% do not.

The next table, table 3.3, addresses the ethnic diversity of the creative class. The creative class consists of a large percentage of Swedish born persons. Actually the creative class consists of a larger share of ethnic Swedes than the non-creative population in occupations. Further, the most noteworthy difference between members of the creative class and the non-creative occupied population is that the creative class consists of a smaller share of persons with Nordic origin. This is a little surprising as the creative class is often considered more mobile than the rest of the population – especially in an international perspective. Non-Westerns tend to be less well educated and less hired due to their educational skills. Therefore the higher share of these ethnic groups within the ‘non-creative people’ is expected. The Scandinavian market can, however, be seen as a labour market where language, culture and education have limited effect on stickiness of the individual worker. This data shows that while similarities between the Scandinavian countries might be obvious, they have little effect on the cosmopolitanism of the creative class compared to the ‘non-creative’ class. Still, a higher share of non-creative people comes from the Scandinavian countries.

Table 3.3: Creative class vs. non-creative class - nation of origin (2002)

| | Creative class | Non-creative class |
|---|----------------|--------------------|
| Africa | 0.3 | 0.8 |
| Asia | 1.4 | 2.8 |
| EU25 without Denmark and Finland | 1.9 | 1.7 |
| Europe without EU25 and the Nordic countries | 0.7 | 2.2 |
| Nordic Countries without Sweden | 2.7 | 3.5 |
| North America (incl. Mexico) | 0.3 | 0.2 |
| Oceania | 0.0 | 0.1 |
| Unknown | 0.0 | 0.0 |
| South America | 0.3 | 0.8 |
| Russia etc. (incl. all former USSR republics) | 0.1 | 0.1 |
| Sweden | 92.2 | 87.9 |
| Total | 100 | 100 |

From tables 3.1, 3.2 and 3.3 we already have a better idea of what the creative class is. The class consists of a higher percentage of persons in the age group 29-49 and 50-64 than the average population in occupation. Moreover, the creative class has a higher average educational level, but it also consists of a considerable share of persons with a more modest education – in terms of years in school. Further, and surprisingly, data shows that the creative class in Sweden has a lower share of people with foreign origin than the non-creative population. This is indeed surprising because the creative class in the literature is considered more mobile, cosmopolitan and tolerant than the remaining population.

Further, as table 3.4 will show, the creative class tends to locate in the largest urban areas. The table also shows that not all regions have the same ability to attract creative people. Regions like Borås, Gävle/Sandviken and Helsingborg/Landskrona are high ranking in terms of populations but relatively low on the creative class LQ. Contradictory regions like Linköping, Umeå, Luleå/Boden and Sundsvall all have relatively high ranking on the creative class LQ compared to the population ranking. These phenomena will, among other things, be looked into later in the report.

The geographical distribution of the creative class in Sweden is apparent from figure 3.1. The map shows that the highest creative class LQ is primarily found in the southern parts of Sweden. In the northern Sweden, only Umeå and Luleå/boden have LQs above 1, which is equal to the Swedish national average. The creative class is widely represented in Sweden; though 6 out of 8 regions with LQ above 1 are in the southern Sweden. However, the map does not offer a clear indication of a non-creative rural north and a creative densely populated south. Hence, a division in creative/non-creative domination between south and north Sweden is not possible to make - an uncreative north does not appear on the map.

Table 3.4: The creative class' share of the workforce in the Swedish regions (2002)

| A-Region | Population rank | Creative class (%) | Creative core (%) | Creative professionals (%) | Location quotient of the creative class (LQ) |
|------------------------|------------------------|---------------------------|--------------------------|-----------------------------------|---|
| <i>Sweden</i> | | 35.68 | 11.43 | 24.25 | 1.00 |
| Stockholm/Södertälje | 1 | 45.98 | 14.95 | 31.03 | 1.29 |
| Uppsala | 5 | 44.69 | 19.16 | 25.52 | 1.25 |
| Linköping | 11 | 42.29 | 17.58 | 24.71 | 1.19 |
| Malmö/Lund/Trelleborg | 3 | 41.40 | 14.67 | 26.73 | 1.16 |
| Gothenburg | 2 | 40.19 | 13.02 | 27.17 | 1.13 |
| Västerås | 13 | 37.38 | 12.06 | 25.32 | 1.05 |
| Umeå | 16 | 36.28 | 14.56 | 21.72 | 1.02 |
| Luleå/Boden | 24 | 36.04 | 12.60 | 23.44 | 1.01 |
| Sundsvall | 19 | 34.88 | 10.69 | 24.19 | 0.98 |
| Karlstad | 9 | 33.09 | 10.60 | 22.49 | 0.93 |
| Örebro | 7 | 33.01 | 11.10 | 21.90 | 0.92 |
| Eskilstuna | 21 | 32.87 | 10.14 | 22.73 | 0.92 |
| Jönköping | 14 | 32.69 | 9.51 | 23.18 | 0.92 |
| Helsingborg/Landskrona | 4 | 31.69 | 8.60 | 23.09 | 0.89 |
| Östersund | 18 | 31.62 | 9.57 | 22.05 | 0.89 |
| Växjö | 15 | 31.59 | 9.07 | 22.52 | 0.89 |
| Norrköping | 10 | 31.37 | 9.61 | 21.76 | 0.88 |
| Borlänge/Falun | 12 | 31.12 | 10.38 | 20.74 | 0.87 |
| Trollhättan/Vänersborg | 23 | 30.71 | 8.37 | 22.34 | 0.86 |
| Halmstad | 22 | 29.92 | 8.33 | 21.59 | 0.84 |
| Kalmar/Nybro | 20 | 29.88 | 9.25 | 20.62 | 0.84 |
| Kristianstad | 25 | 29.81 | 9.13 | 20.68 | 0.84 |
| Borås | 6 | 29.48 | 7.65 | 21.82 | 0.83 |
| Gävle/Sandviken | 8 | 28.92 | 9.17 | 19.75 | 0.81 |
| Uddevalla | 17 | 28.80 | 8.41 | 20.39 | 0.81 |

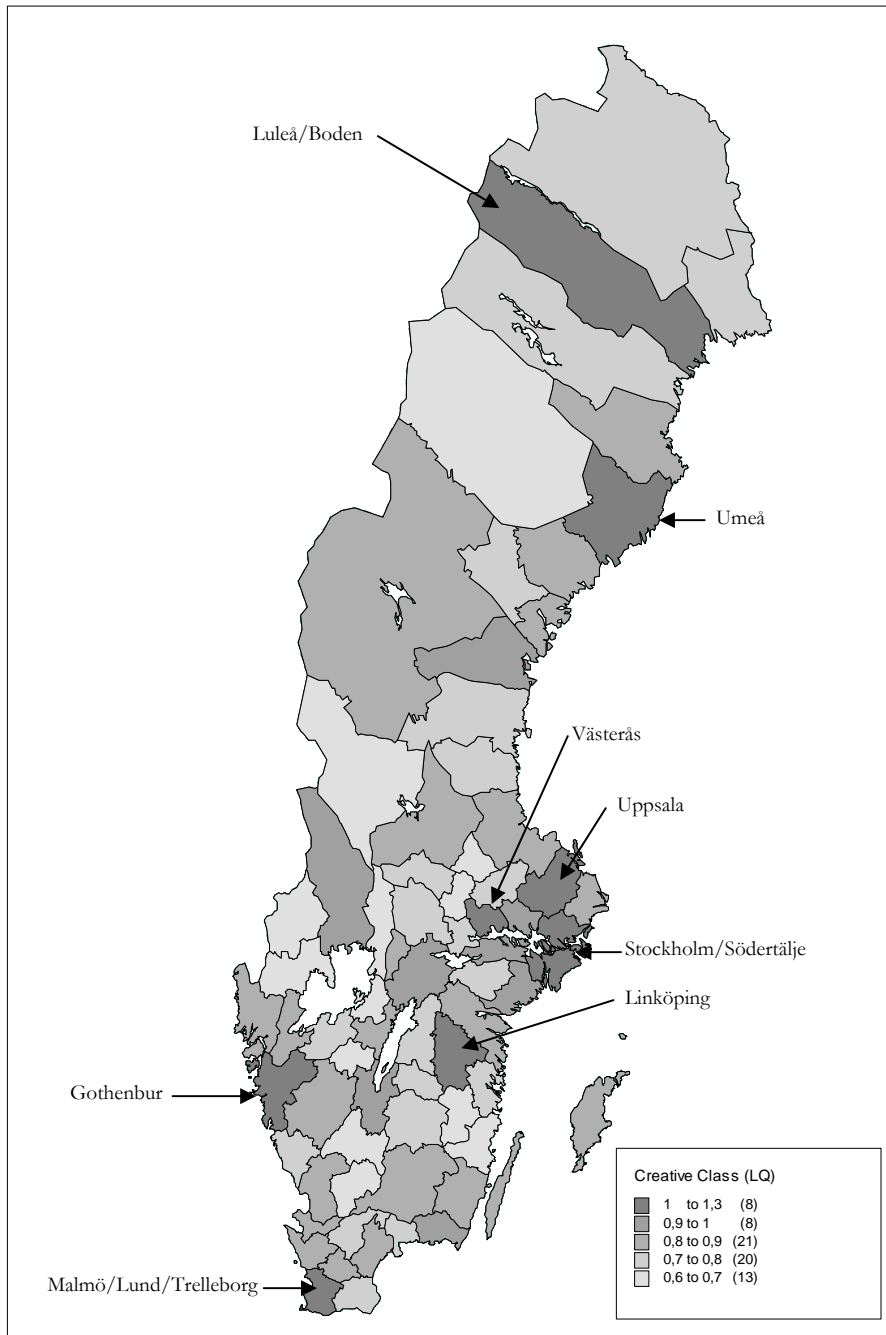


Figure 3.1: Map of the location of the Creative Class in Sweden in 2002

In many ways, the geography of human capital is similar to the geography of the creative class because the talent variable (equal to human capital) represents 41% of the occupation variable. Treating talent as an independent variable is however important for understanding the potential development in a region. If the workforce is not matching the needs of a highly profiled knowledge based production, then to strategically focus on

breathing such a regional structure would be meaningless. Though step-by-step changes and adjustments in the regional development policies are always welcome, most research also indicates that regional growth is most successful when assets of the local workforce are taken into account in the strategic planning.

The Talent Index used by Florida (2002) and also presented here is measuring human capital as a supplement to the other indexes that in the end constitute a creativity indication. The Talent Index is a simple indication of the share of persons with a bachelor degree or above. In the Swedish case we are not able to distinguish between bachelor degree and master degree because of the Swedish occupational system. Therefore, only a distinction between bachelor/master degree and PhD is possible in figure 3.2.

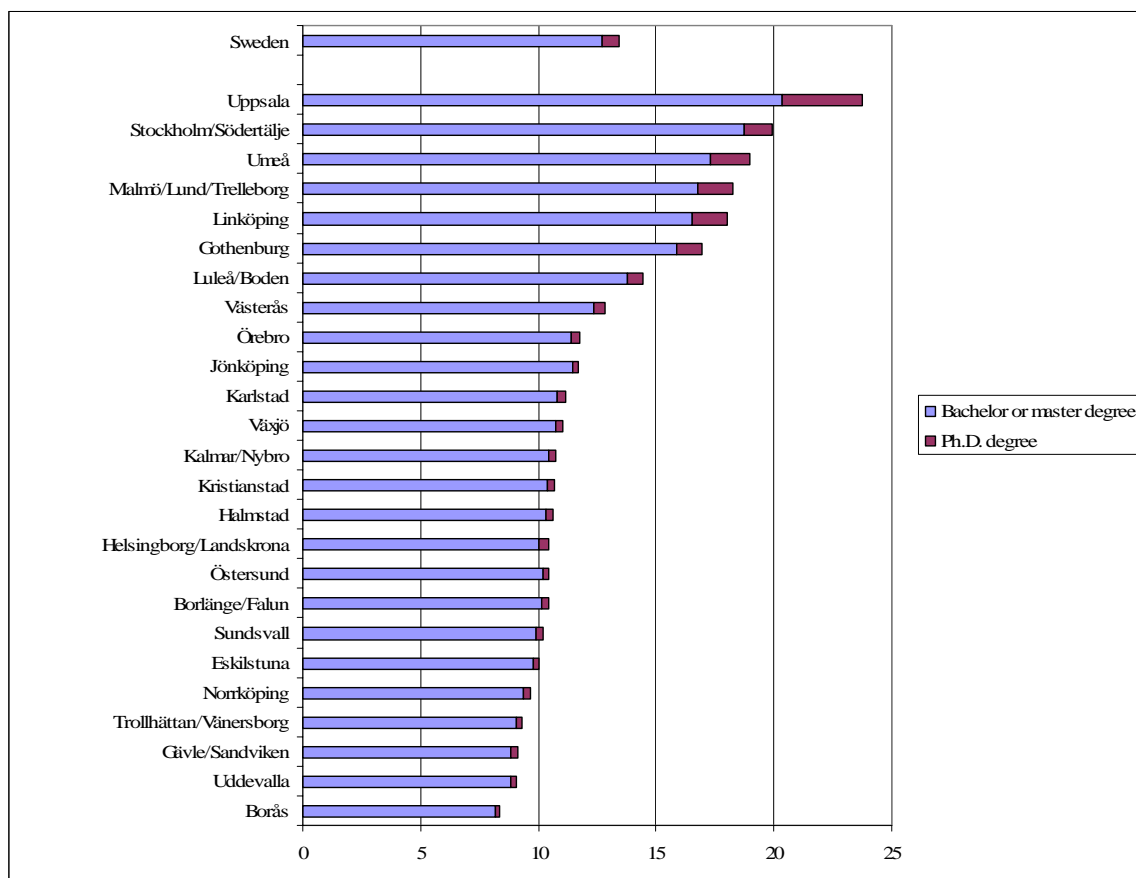


Figure 3.2: The share of the population 18+ with a bachelor degree or above (2002)

Figure 3.2 makes the tendencies clear: regions with large universities have the highest share of people with high formal education. Uppsala, Stockholm/Södertälje, Umeå, Malmö/Lund/Trelleborg, Linköping and Gothenburg all have well-known and large universities. This is also apparent from the share of people with PhD degrees. Uppsala and Umeå have the largest shares of PhD candidates. Most possibly, this can be explained by the particular importance the university plays in these two regions.

Stockholm/Södertälje, Malmö/Lund/Trelleborg, Linköping and Gothenburg all play important roles as centres of different types of production within a broad variety of industries, whereas Uppsala and Umeå are relatively more dependent on the university and university activities when factors of impact on growth are analysed.

Table 3.5: Educational level data for the employed workforce 1993-2002 in different sectors*

| City region | Share of workforce with a bachelor degree or above 2002 | | | Percentage changes 1993-2002 | |
|------------------------|---|--------------|---------------|------------------------------|---------------|
| | All | High-tech | Non-high-tech | High-tech | Non-high-tech |
| <i>Sweden</i> | <i>17.99</i> | <i>29.38</i> | <i>16.82</i> | <i>106.10</i> | <i>53.86</i> |
| Uppsala | 27.48 | 55.08 | 22.46 | 55.97 | 54.25 |
| Stockholm/Södertälje | 24.83 | 37.65 | 22.87 | 108.43 | 62.62 |
| Umeå | 23.77 | 23.05 | 23.84 | 95.55 | 56.56 |
| Linköping | 23.23 | 33.85 | 21.04 | 113.73 | 55.37 |
| Malmö/Lund/Trelleborg | 22.99 | 41.81 | 21.10 | 137.22 | 61.37 |
| Gothenburg | 21.31 | 34.23 | 19.04 | 127.96 | 60.13 |
| Luleå/Boden | 19.31 | 26.17 | 18.72 | 95.87 | 40.92 |
| Västerås | 17.27 | 22.35 | 16.90 | 10.71 | 63.84 |
| Örebro | 15.59 | 12.34 | 15.80 | 145.98 | 58.06 |
| Karlstad | 15.45 | 25.46 | 14.80 | 83.70 | 45.38 |
| Jönköping | 15.37 | 22.87 | 14.85 | 161.44 | 70.27 |
| Östersund | 14.78 | 16.59 | 14.68 | 159.70 | 36.55 |
| Kristianstad | 14.67 | 12.02 | 14.81 | 123.58 | 38.34 |
| Helsingborg/Landskrona | 14.54 | 20.43 | 14.21 | 44.97 | 52.15 |
| Växjö | 14.53 | 20.55 | 14.03 | 194.44 | 54.03 |
| Borlänge/Falun | 14.48 | 19.18 | 14.23 | 76.58 | 45.29 |
| Sundsvall | 14.28 | 24.30 | 13.58 | 162.82 | 50.52 |
| Eskilstuna | 14.09 | 14.18 | 14.08 | 135.53 | 51.43 |
| Norrköping | 14.02 | 24.23 | 13.55 | 51.29 | 50.29 |
| Halmstad | 13.92 | 16.45 | 13.85 | 171.13 | 58.49 |
| Kalmar/Nybro | 13.87 | 13.46 | 13.90 | 123.16 | 57.49 |
| Trollhättan/Vänersborg | 13.71 | 12.55 | 14.04 | 91.70 | 49.48 |
| Gävle/Sandviken | 13.36 | 16.34 | 13.18 | 122.46 | 50.67 |
| Borås | 12.29 | 12.61 | 12.27 | 119.18 | 57.13 |
| Uddevalla | 11.94 | 7.15 | 12.27 | 80.43 | 41.85 |

*A list of high-tech industries can be seen in table 2 in Appendix 1

Though the share of highly educated people varies from almost 24% in Uppsala to 5.5% in Hultsfred/Vimmerby, political actions have been taken to avoid a concentration of highly educated people. Expansion of university and colleges into less urban areas has helped to maintain some of the highly educated people within these areas. Additionally, the number of students has increased, Wikhall (2001). Wikhall does, however, point to an important problem. In general, the less urban universities end up as exporters of highly

educated people – people move when they have finished their education, partly because they want to move to more urban settings, partly because the job opportunities are few in the less urban regions. Having said this, we would, however, expect the decentralising policies to have some kind of effect on the educational level of the labour force. Consequently, without political initiatives we could expect a more significant difference in level of education between urban and less urbanised regions.

Table 3.5 shows the level of education for the employed workforce – in opposition to figure 3.2 which shows the educational level of the total population.

Not surprisingly, the regions with major universities are topping this list. Obviously, this is due to the university activities and the related industries. The regions with the major universities also top the list if only the level of education within high-tech industries is considered. This suggests that the most knowledge intensive productions are located within the regions that also have the major universities. Analysing on the impact of the decentralisation of universities and colleges in Sweden, Lundquist (2000) finds no relationship between the location of universities and the start-up of new firms.

A considerable change in the level of education within both high-tech and non-high-tech production has taken place in Sweden since 1993: this is one important finding of table 3.5. This refers back to Wikhall (2001) who pointed to the growing number of people with universities or college degrees as one important outcome of the decentralisation of educational and research institutions. A prompt conclusion would therefore be that Sweden is manifesting its status as a knowledge intensive country. The massive changes in the high-tech column have to be seen in relation to the rather limited number of employed in these industries. Consequently, even small variations result in large changes in value, but in general the picture is clear – the share of employed people with a higher level of education is increasing in general; but particularly in the high-tech industries.

Table 3.6 goes further and illustrates the level of education within creative and non-creative groups

Table 3.6: The share of people (aged 18-64) with a bachelor degree or above within the creative class, the creative core, the creative professionals and the non-creative people in Sweden 2002

| City region | Creative class (All) | Creative core | Creative professionals | Non-creative people |
|------------------------|-------------------------|---------------|---------------------------|------------------------|
| <i>Sweden</i> | <i>41.0</i> | <i>68.5</i> | <i>28.0</i> | <i>5.9</i> |
| Uppsala | 53.9 | 79.3 | 34.8 | 10.4 |
| Umeå | 52.4 | 80.8 | 33.4 | 8.5 |
| Linköping | 50.2 | 76.7 | 31.5 | 6.5 |
| Malmö/Lund/Trelleborg | 47.9 | 76.3 | 32.3 | 9.4 |
| Luleå/Boden | 46.2 | 72.3 | 32.1 | 5.3 |
| Gothenburg | 44.1 | 72.3 | 30.6 | 8.4 |
| Stockholm/Södertälje | 43.8 | 65.8 | 33.3 | 10.5 |
| Västerås | 40.0 | 67.9 | 26.7 | 5.1 |
| Kristianstad | 39.8 | 71.7 | 25.8 | 4.3 |
| Karlstad | 39.5 | 70.8 | 24.8 | 4.6 |
| Örebro | 39.3 | 65.7 | 25.9 | 5.5 |
| Kalmar/Nybro | 39.3 | 72.5 | 24.4 | 4.7 |
| Halmstad | 39.2 | 71.0 | 26.9 | 4.3 |
| Borlänge/Falun | 39.2 | 67.6 | 24.9 | 3.6 |
| Jönköping | 39.1 | 71.6 | 25.8 | 4.9 |
| Östersund | 38.6 | 64.1 | 27.5 | 4.4 |
| Växjö | 37.2 | 71.4 | 23.4 | 4.7 |
| Helsingborg/Landskrona | 36.4 | 66.4 | 25.2 | 4.6 |
| Gävle/Sandviken | 35.4 | 63.3 | 22.5 | 3.9 |
| Uddevalla | 35.2 | 67.9 | 21.7 | 3.6 |
| Norrköping | 35.0 | 63.2 | 22.6 | 4.2 |
| Trollhättan/Vänersborg | 34.6 | 60.6 | 24.8 | 3.6 |
| Eskilstuna | 34.5 | 58.3 | 23.9 | 4.1 |

Not surprisingly, data shows that the largest shares of highly educated people are found in the creative core. It is, however, noteworthy that a relatively high share of the creative core, going from 20% up to 40%, does not have a university degree equal to or above bachelor level. This has to be interpreted as a combination of small errors in two different variables (education and occupation), combined with the fact that architects, engineers etc. can achieve their title through practise orientated programmes and not only through theoretical programs. This again brings us back to the critique by Glaeser (2004). He argued that talent and the creative class are the same to a large extent. This, however, shows that a large share of the assumed most creative people do not have the formal education that Glaeser uses as his key variable. Talent might be dominating when regressions are made, this is in fact the case in Sweden, but still up to 40% of the creative core cannot be explained by a talent variable only. Therefore, adding additional variables

– like occupation or a broader concept of educational level – is presumably important when explaining regional growth and creative potential. Having said this, we once again have to state that the creative class and educational level correlate with 0.9 in Sweden, indicating that the two variables in a Swedish context to a large extent can be used as proxies for each other.

Concluding on the location of talent and the creative class in Sweden, two essentials have to be stressed. First, the creative class consists of a large share of the highly educated people in Sweden but it does not only count people with high degrees. On the contrary, the creative class counts a majority of people with educational levels below bachelor. Also within the creative core, which is understood as the most innovative, a considerable share does not have formal education equal to bachelor level. This is an important finding because the creative class is often referred to as equivalent to human capital. Secondly, the locations of the creative class and talents are concentrated around the large cities and are in general higher where universities and colleges are located.

Having stated the location patterns of talent and the creative class in Sweden, we turn to an analysis on the indicators of people climate and business climate. By analysing these two factors, we will hopefully obtain a better understanding of the relationship between growth of technology, talent and tolerance. First, we present indicators of people climate. Next, indicators of business climate, and, finally, we test the relationship between these and regional growth in Sweden.

4. People Climate

To Richard Florida and the creative class approach, people climate is very important for future growth. In the international project that this study is a part of, we have decided to look at two fundamental indications of people climate. The first is *tolerance*, indicating the openness toward differentness; the second is indications of quality of place.

Indicators of Tolerance

In the creative class approach, tolerance is used as a measure for regions' open-mindedness toward people looking different, thinking or acting differently. This is important because diversity is seen as an important factor in facilitating the dynamics that spin off innovation. Tolerance is thus important for creating an attractive people climate.

Here tolerance is measured by several variables. First, a bohemian index will be introduced; next, two openness indexes are presented measuring the share of non-Western and the total number of the foreign born population within the regions. Finally, an integration index illustrating the relation between people of foreign origin and people with Swedish origin in employment is applied.

The Bohemian Index

In England in the 1800th century, canaries were taken deep into the coal mines. The canaries were used to determine the gas level of the air that the miners were breathing. If the gas level was too high, the canary would die and the coal miners would hurry up to the surface. The Bohemian Index should be understood in the same way. If openness and tolerance toward differentness are absent in a region, bohemian people will flight. This is the argument used by advocates of the creative class thesis, legitimising the Bohemian Index as a proxy for tolerance.

Bohemian occupations count authors, artistes etc., and the Bohemian Index is measured both as bohemians pr. 1000 employed and as a location quotient. As with the review of the location of the creative class, LQs above 1 indicate an above national average concentration whereas a value below 1 indicates the opposite.

Table 4.1 underpins the earlier statement of the tendencies of oligopoly in the urban hierarchy in Sweden. With respect to concentrations of the bohemian people, only three cities, Stockholm, Malmö and Gothenburg, have an LQ above 1. This is a localised

concentration which is not seen in any of the other indexes. The main reason can probably be found in the position of the regions. They are all large cities providing large city atmospheres with many sources of inspiration, which is often pointed to as essential for young hopeful artists in developing style and image. The three regions also have important music scenes, museums and a young population (ranking 1, 2 and 3 in the age group 30-49 and 4, 5 and 6 in age group 18-29), which results in a lively community.

It can, however, also be other things that influence the location pattern of bohemians in Sweden. Such influencing parameters can be a critical mass interested in buying artistic products, schools that teach art and cheap housing suitable as studios. Answers to this have to be found through more qualitative methods. The presence of bohemians is, however, only one of four indexes that we use as indicators of tolerance. Openness toward foreigners and integration of foreigners into the labour market are other possible indicators of tolerance.

Tabel 4.1: Bohemian occupation 2002*

| A-Region | Bohemian occupation (LQ) | Bohemian pr. 1000 employed |
|------------------------|---------------------------------|-----------------------------------|
| <i>Sweden</i> | <i>1.00</i> | <i>11.71</i> |
| Stockholm/Södertälje | 1.95 | 22.89 |
| Malmö/Lund/Trelleborg | 1.24 | 14.56 |
| Gothenburg | 1.13 | 13.19 |
| Växjö | 0.95 | 11.09 |
| Uppsala | 0.91 | 10.70 |
| Luleå/Boden | 0.91 | 10.67 |
| Umeå | 0.85 | 9.91 |
| Helsingborg/Landskrona | 0.84 | 9.88 |
| Borlänge/Falun | 0.82 | 9.58 |
| Borås | 0.77 | 9.06 |
| Östersund | 0.75 | 8.77 |
| Halmstad | 0.75 | 8.76 |
| Karlstad | 0.72 | 8.38 |
| Sundsvall | 0.71 | 8.37 |
| Västerås | 0.70 | 8.25 |
| Norrköping | 0.68 | 8.00 |
| Örebro | 0.67 | 7.87 |
| Jönköping | 0.67 | 7.84 |
| Eskilstuna | 0.66 | 7.72 |
| Kalmar/Nybro | 0.64 | 7.53 |
| Linköping | 0.64 | 7.47 |
| Gävle/Sandviken | 0.60 | 7.03 |
| Kristianstad | 0.54 | 6.30 |
| Uddevalla | 0.46 | 5.41 |
| Trollhättan/Vänersborg | 0.45 | 5.29 |

* A list of occupations defined as bohemian is found in table 3 in Appendix I

It is noteworthy that some of the regions that score high on some of the coming indexes get low scores on this index. Regions dominated by traditional industrial production such as Trollhättan and Linköping have a significant lower concentration of bohemians than the regions with which they shared similar values in earlier indexes. This might suggest that city regions dominated by a classic industrial structure like automobile, mining, aircraft, steel production etc. have little attractive effect on bohemians (Cederlund 2004).

To control for the dominance that the Stockholm/Södertälje region has on the Bohemian Index, we have calculated the index without Stockholm/Södertälje. As a result nine regions are entering the list of regions with an LQ above 1; this group already counts Malmö/Lund/Trelleborg and Gothenburg. They are Växjö, Uppsala, Luleå/Boden, Umeå, Helsingborg/Landskrona, Borlänge/Falun, Borås, Östersund and Halmstad. This gives a good indication of the dominating character that Stockholm has in regard to bohemian activities.

Openness

Openness towards different people living by different norms etc. is difficult to measure quantitatively. We try, however, by looking at the foreign born population as a proxy of tolerance toward differentness. We use two different indexes: Openness 1 indicates only non-Western foreign born persons as a share of the total population. Openness 2 indicates all foreign born people as a share of the total population – a categorisation of Western and non-Western ethnic groups can be seen in table 4 in Appendix 1. In the Openness 1 and Openness 2 Indexes a high score, equal to a high rate of foreign born people, is seen as a positive indication of a tolerant environment. This is of course not unproblematic. It does not say anything about tolerance in terms of integration, acceptance etc. High concentrations of foreign ethnic groups can lead to conflicts, and to collapse of city districts. Therefore critical comments on Openness 1 and Openness 2 and an attempt to come closer to a nuanced indication of tolerance and openness will follow after the Openness 1 and Openness 2 indexes have been presented.

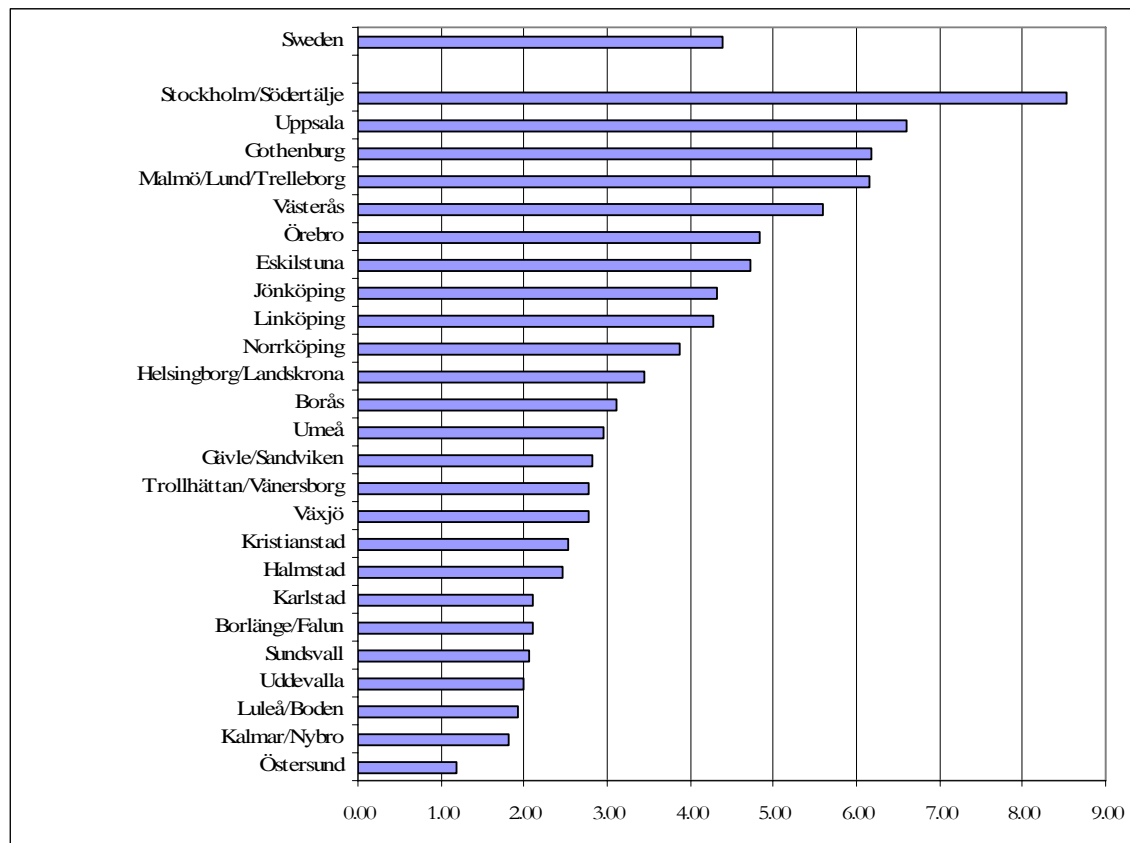


Figure 4.1: Openness 1 (2002) share of people of non-Western origin

Figure 4.1 is the Openness 1 Index measured as the share of the population that origin from a non-Western country. The Swedish average is close to 4.5%, and the figure reveals that Stockholm has almost the double share of the average. Uppsala, Gothenburg and Malmö/Lund/Trelleborg follow but with shares that are almost 2 percentage points lower. Västerås, number five on the list, has a non-Western population share closer to Malmö/Lund/Trelleborg than Örebro which comes in six. The high rankings of Stockholm, Uppsala, Gothenburg and Malmö are most likely related to the attractive effect urban areas have on foreign people. The high ranking of Västerås can most likely be explained by immigration of foreigners assigned for jobs at AAB – a large Swedish industrial corporation. The figure also shows that with some exceptions the ranking comes close to the ranking of the population. The most significant exceptions are Helsingborg/Landskrona, Borås and Karlstad with a lower share than expected from the ranking according to population, and Västerås and Eskilstuna which have a higher share than expected.

The Openness 1 Index is introduced because we expect that the non-Western born population is more culturally different from the Swedish born population than the

Western born population. A high share of non-Westerns should therefore indicate a high level of tolerance. To avoid only looking for non-Westerns, we have also made an Openness 2 Index measuring the share of all foreign born people, including people with Western as well as non-Western origin. One particular reason for looking at all foreign born populations is that refugees given asylum and residence permit are often located due to political actions rather than own choices. Thereby, the Openness 1 Index may be influenced by placement of the foreign born persons at the time of entering the country rather than their own original choice.

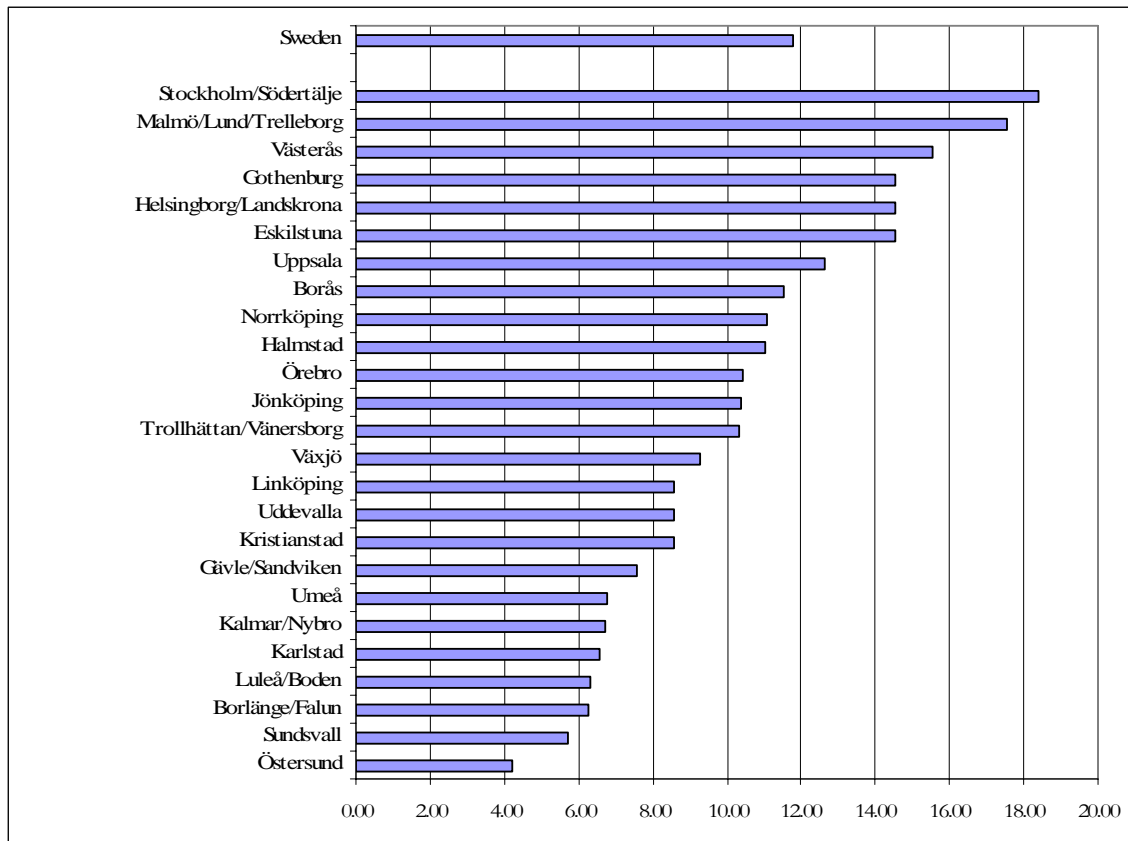


Figure 4.2: Openness 2 (2002) share of people of non-Swedish origin

Looking at figure 4.2 the same picture appears as in figure 4.1. The large city regions are in top together with a few of the smaller regions that have a relatively large foreign born population due to e.g. factories that experienced shortage on labour and therefore engaged guest workers in the 1960s and 1970s. One of the notable differences is that Helsingborg/Landskrona, the fourth largest region in population, has come out relatively low in many indexes; it ranks as 11 in the Openness 1, but comes out 5th in the Openness 2. Consequently, the Helsingborg/Landskrona region has a high share of Western foreign born population – presumably Danish. The Helsingborg/Landskrona region will appear

intolerant when only the Openness 1 Index is examined, but when the Openness 2 is examined, it stands out as tolerant.

There is, however, more to tolerance than a high share of foreign born population. Measuring tolerance as the share of foreign born population is fairly problematic. High concentrations of a foreign born population can lead to segregation. Therefore, we have created a third index, Integration Index⁸, based on the relation between the share of foreign born people in the population and the share of employed foreign born people of all employed people. By putting the two variables in relation to each other, we obtain an indication of the degree to which the foreign born population is integrated into the labour market. This helps to present a nuanced picture of the interaction between the foreign and the domestic born population, and, hence, an indication of integration. To us, such a measure is an important input and supplement to Florida's creative class indexes.

The two following figures investigate tolerance understood as integration on the labour market. We believe that tolerant regions are successful in integrating foreign people into the labour market, while a less tolerant environment will have a lower employment rate among foreigners.

⁸ This index is developed by Høgni Kalsø Hansen and Karl-Johan Lundquist, Department of Social and Economic Geography, Lund University.

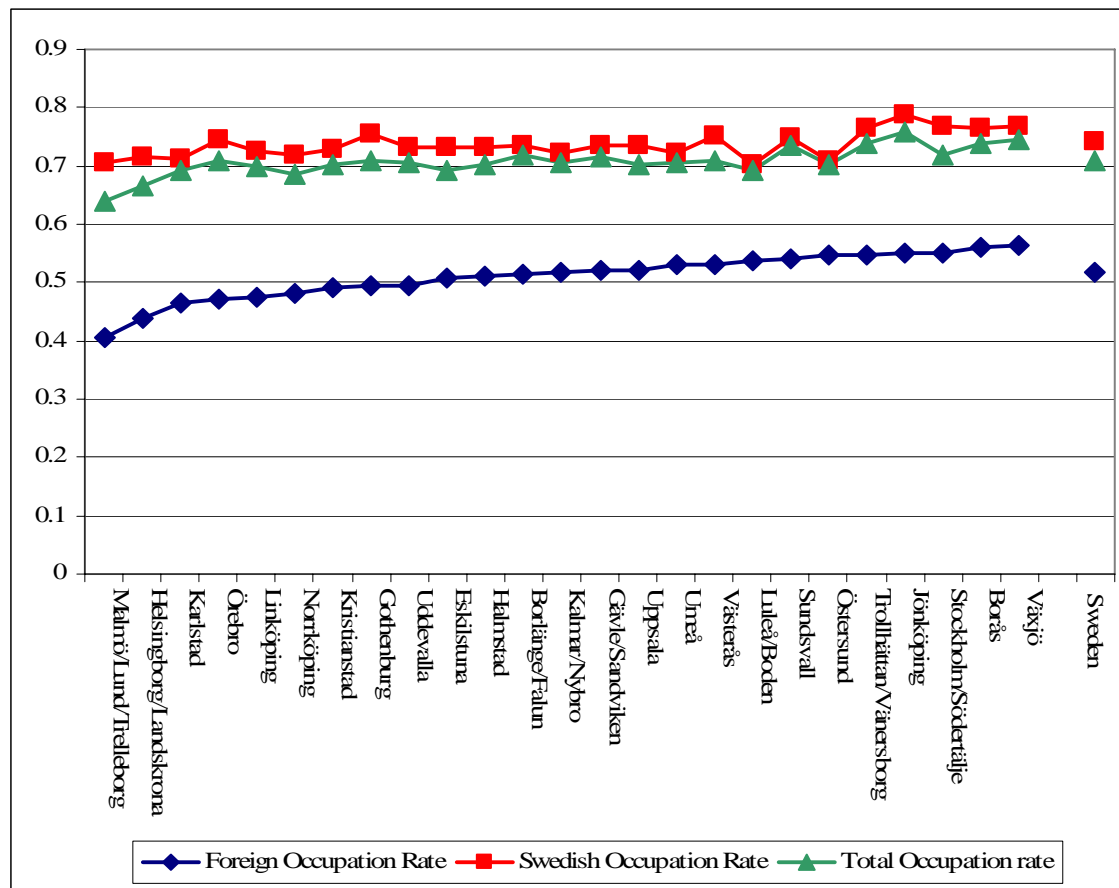


Figure 4.3: Occupation rate for Swedish born and foreign born populations (aged 18-64) 2002

Three curves are plotted in figure 4.3. The upper curve illustrates the occupation rate among the Swedish born population. The curve in the middle indicates the occupation rate in total, and, finally, the lower curve represents the occupation rate among the foreign born population. In a perfect world, the upper and the lower curves should lie on the same values – the middle curve. This is, however, not a perfect world, and as in many other European countries, differences between the occupation rates for the two ‘ethnic’ groups are evident in Sweden. The ethnic Swedes have a higher rate of participation on the labour market in all the regions, and the gap between the foreign occupation curve and the Swedish population curve is significant in all regions.

In general, the figure indicates a weak trend between the total occupation rate and the foreign occupation trend. The higher the occupation rate is, the higher the foreign occupation rate gets. Malmö/Lund/Trelleborg, Helsingborg, Karlstad and Örebro all have low scores on the foreign occupation rate indicating difficulties in getting the foreign population to participate on the labour market.

It is noteworthy that both the Malmö/Lund/Trelleborg and Helsingborg/Landskrona regions have significantly low occupational rates for the foreign born population. These two regions are located in Scandia and both serve as entry points to Denmark and Europe. Hence, we controlled for trans-border commuting. Adding Swedish born and non-Swedish born people living in the two regions but working in Denmark only brings limited changes. Malmö/Lund/Trelleborg still come out last with a notably low occupational rate for the foreign born population. Only Helsingborg/Landskrona marginally climbs one position up, switching position with Karlstad. Accordingly, while adding the cross-border commuters help Helsingborg/Landskrona one position up, it does not hide the fact that the two largest Scandia urban areas have low participation rates for the foreign born population⁹.

In the other end of the figure, Sundsvall, Östersund, Trollhättan/Vänersborg, Jönköping, Stockholm/Södertälje, Borås and Växjö all have occupational rates for foreign born on a similar level. With the exception of Östersund, all the seven regions have high occupation rates in general, and this may of cause be an important factor in explaining the higher foreign occupational rates in these regions. A high occupational rate in general typically results in a higher participation rate on the labour market by weaker social groups. Hence, regions that experience strong economic development will be more tolerant, or simply put: demand for all types of labour increases with the economic performance of a region.

Östersund, however, had a low employment rate in general and still a high rate of foreign participation on the labour market. This is one reason why employment rates have to be seen in relation to each other. This is done in the Integration Index, figure 4.4. If a total match between the Swedish born and the foreign born occupation rate was present, the Integration Index would have had a value of 100. Consequently, the smaller the gap is between the two occupation rates, the higher the score becomes in the index.

⁹ We are only in possession of trans-border commuter data from Scandia to Sealand in Denmark. Trans-border commuting can also be relevant for some of the regions located along the Norwegian and the Finish border as well as for the Stockholm/Södertälje region. Therefore, we have decided not to add the commuting data from Malmö/Lund/Trelleborg and Helsingborg/Landskrona into the graphic figures.

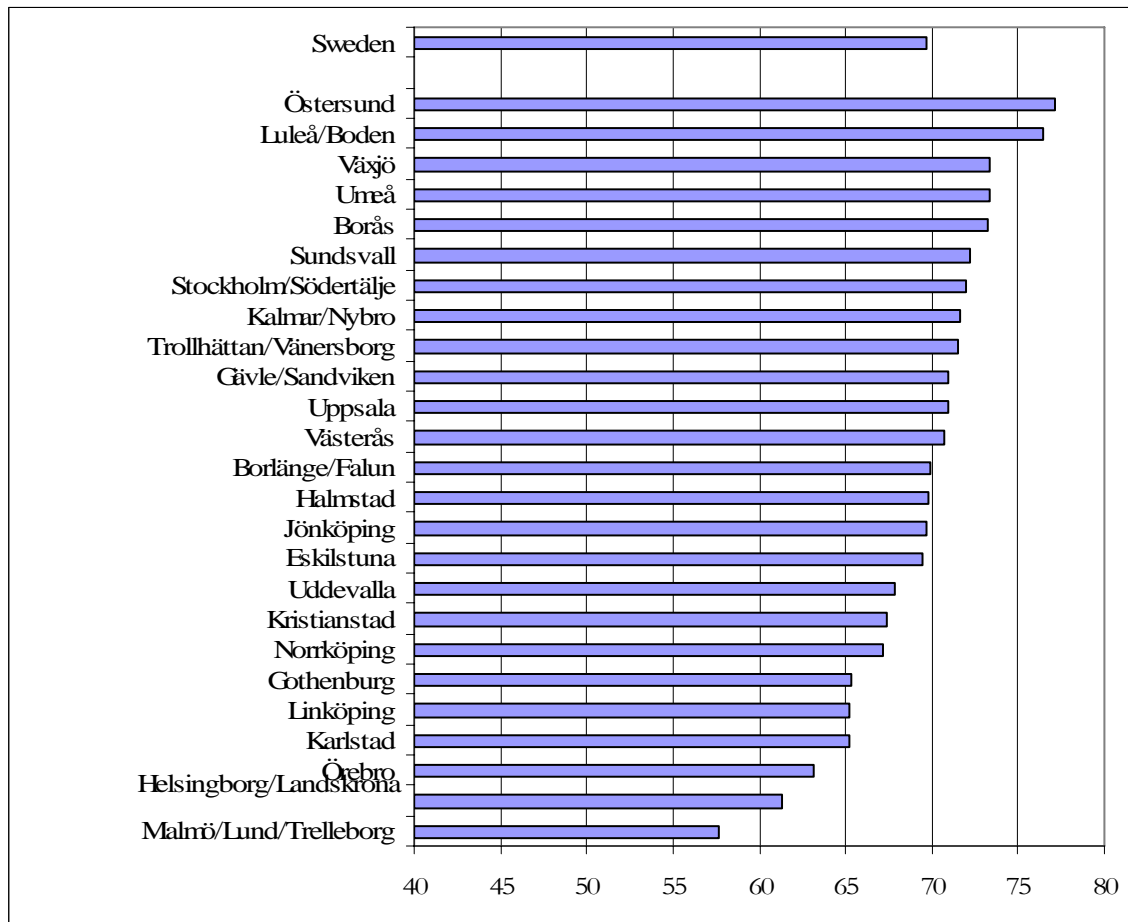


Figure 4.4: Integration Index 2002

The index shows that Malmö/Lund/Trelleborg and Helsingborg/Landskrona still obtain the least favourable scores and that Karlstad and Örebro have switched places compared to figure 4.4. Again Malmö/Lund/Trelleborg and Helsingborg/Landskrona have been controlled for cross border commuting. Malmö/Lund/Trelleborg still come out last while Helsingborg/Landskrona again climb up one position switching with Örebro, but with a value closer to Karlstad, Linköping and Gothenburg than to Örebro. The top of the list shows the regions that, relatively, are best at integrating the foreign born labour force into the labour market. Östersund and Luleå/Boden come out with good scores. Relating these findings to the findings in figure 4.3, it is evident that both Östersund and Luleå/Boden have noteworthy lower occupation rates than many of the other regions. Figure 4.3 showed a tendency towards a higher integration of foreign born people into the labour market as the employment rate rose. Östersund and Luleå/Boden reflect a different image. Östersund and Luleå/Boden only have the 18th and the 22nd, respectively, best employment rates among the 25 regions presented here. Four out of the ten best performing regions on the Integration Index are ranking below the ten best performing regions on employment rates. This might imply that parameters different from

employment rates play an important role in the integration of foreign born population into the labour market.

However, there is one striking feature; 7 out of the 10 regions with best integration scores perform poorly on the Openness 2 Index, which indicates that higher shares of foreign born population in most cases lead to a tendency to lower scores on the Integration Index. Stockholm is an outstanding exception. The combination of a high level of foreign born population and a high level of integration on the labour market, seen in Stockholm, proves that successful integration on the labour market cannot be narrowed down to a discussion on share of foreign born only.

If analysing some of the regions that get high and low scores, it turns out that Östersund has a high level of education among Western born foreigners and that Luleå/Boden has a good educational level among foreign born in general. Naturally, this can be one of the explanations why the two regions experience such a high score on the Integration Index; but the educational level may also be a result of better integration of foreigners into the labour market. Linköping, however, also has a relatively high educational level among the foreign Western born population in occupation, but Linköping achieves a low score on the Integration Index. Therefore the educational level among the foreign born population does not result in a high integration score alone. Stockholm/Södertälje, Gothenburg, Malmö/Lund/Trelleborg and Helsingborg/Landskrona all reflect relatively small differences between the educational level among the Swedish and the foreign born population in occupation. Additionally, looking at the relative difference between the educational level of the Swedish born and the foreign born population shows that no systematic patterns of better integration are evident where the educational level is higher. In general the non-Western foreign born population has a lower level of education, whereas the Western foreign born population in general has a slightly higher level of education. This does, however, not really influence the employment rate in general. Actually Stockholm comes out good on the Integration Index but has the largest gap in percentage points between the non-Western foreign born population and the Swedish population. Again this brings a very muddy picture of possible patterns between the origin, employment rate and educational level. Hence, explanations of the participation level of the foreign born population in the labour market can be linked to some kind of tolerance indication - stating that the higher score a region obtains on the Integration Index, the more tolerant the region is.

The Integration Index seems sensitive to share of foreigners in the population. This can be an argument for using both the Openness Indexes and the Integration Index – and the Bohemian Index – to indicate tolerance. Östersund and Luleå/Boden and Malmö/Lund/Trelleborg are extremes by being on top of one and last in another index.

However, in addition to these regions when combining Openness and Integration, it is notable that Stockholm being first on the Openness 1 and 2 comes out 7th in the Integration Index with a significantly better score than Malmö/Lund/Trelleborg or Gothenburg. The same holds for e.g. Växjö, Borås and Västerås that all obtain good scores in all three indexes. To us, this indicates a higher tolerance level in these regions compared to Malmö/Lund/Trelleborg, Gothenburg and Helsingborg/Landskrona.

Summing up on the tolerance indicators, the Bohemian Index reveals a concentration of Bohemian activities in the three largest regions. Stockholm, however, has a massive impact on the Bohemian Index and excluding Stockholm from the calculations provides enough space for 11 instead of 3 regions with an above average concentration. When the Openness parameter is examined, primarily the large regions achieve good scores. To get a more nuanced view on the tolerance parameter, we also introduced an Integration Index. This index shows a more differentiated picture, where the connection between population and rank on the index is less evident – the large regions are no longer in the top, and the small regions are no longer in the bottom.

Indicators of Quality of Place

Besides tolerance, quality of place also has an impact on the people climate and, hence, the attractiveness of a region. In his new book, Florida (2005a) points to the mobility of the creative class and thereby stresses the importance of having something that attracts and retains talents from all over the world. Along with tolerance, intellectual colleagues and a variety of jobs, two things are believed to have an impact on the location of creative people and talents: a well functioning welfare state and a broad variety of cultural supply.

In the following, two indicators will be introduced as proxies for quality of place. The Public Provision Index (PPI) grew out of a desire to be able to give an indication of the welfare state, and the Cultural Opportunity Index (COI) is constructed to measure the cultural supply within a region.

Public Provision

The Public Provision Index (PPI) is developed to analyse the public service level that the population is offered. The underlying argument for this is that talented and creative people are believed to be drawn toward regions that can offer a high public service level. The index primarily includes people employed within education and health care. It is measured as the number of employed people in public service industries by every 100 inhabitants in a region. For welfare states like Denmark, Sweden and Norway many of the welfare functions are centrally decided and therefore regional differences are small

and often politically influenced. Naturally, this brings along some difficulties in the direct interpretation of the results. On the other hand, if creative and talented people are attracted toward places with a high public service level, they probably do not care whether this level is a function of local, regional or national governments. Further, it has to be stressed that the PPI does not address the quality or productivity of the service that is provided in a region.

Table 4.2: Public Provision Index^{*) **)}

| Region | PPI 1993 | PPI 1997 | PPI 2002 | Change in PPI 1993-2002 (%) |
|------------------------|--------------|--------------|--------------|-----------------------------|
| <i>Sweden</i> | <i>12.24</i> | <i>11.00</i> | <i>12.23</i> | <i>2.18</i> |
| Umeå | 17.48 | 16.18 | 17.41 | 4.84 |
| Luleå/Boden | 14.95 | 13.39 | 14.74 | -2.13 |
| Östersund | 13.63 | 12.56 | 14.09 | -2.76 |
| Borlänge/Falun | 12.70 | 12.01 | 13.74 | 6.13 |
| Örebro | 14.06 | 11.99 | 13.73 | 0.86 |
| Linköping | 14.27 | 12.12 | 13.70 | -0.74 |
| Uppsala | 12.97 | 12.37 | 13.67 | 12.45 |
| Kristianstad | 14.25 | 13.22 | 13.60 | -4.30 |
| Karlstad | 13.25 | 12.30 | 13.16 | -2.91 |
| Jönköping | 12.50 | 11.46 | 13.15 | 8.74 |
| Trollhättan/Vänersborg | 12.47 | 11.61 | 13.14 | 5.81 |
| Kalmar/Nybro | 12.57 | 11.50 | 13.10 | 3.36 |
| Växjö | 12.36 | 11.54 | 13.04 | 4.77 |
| Sundsvall | 12.79 | 11.49 | 13.03 | -1.21 |
| Borås | 11.88 | 11.41 | 12.68 | 6.69 |
| Halmstad | 12.37 | 11.53 | 12.68 | 5.60 |
| Malmö/Lund/Trelleborg | 12.69 | 11.30 | 12.51 | 7.09 |
| Uddevalla | 12.37 | 11.47 | 12.49 | 0.43 |
| Göteborg | 11.60 | 10.55 | 12.01 | 11.62 |
| Västerås | 11.71 | 10.34 | 11.65 | 2.57 |
| Gävle/Sandviken | 11.63 | 10.74 | 11.65 | -1.81 |
| Eskilstuna | 11.97 | 10.62 | 11.65 | -1.19 |
| Norrköping | 11.59 | 10.04 | 11.62 | 0.06 |
| Stockholm/Södertälje | 11.62 | 9.69 | 10.68 | 0.91 |
| Helsingborg/Landskrona | 9.83 | 8.92 | 10.09 | 6.26 |

*Table 5 in Appendix 1 provides an overview of the industries included in the Public Provision Index

**Data shall be taken with some caution because a shift in the Swedish classification nomenclature (SNI) in 2002 can cause some differences in the classification of the industries.

The first noticeable thing in table 4.2 is that more than 7 percentage points are dividing Umeå and Helsingborg/Landskrona. This gap equals 41%. The difference between Umeå and Luleå/Boden, being number two in the list, is 11%, which is a considerable discrepancy. Accordingly, on the one side the first impression tells us something about a

relative lack of public services in Helsingborg/Landskrona, and on the other side it also stresses the high level that Umeå has reached. When examining the PPI, it seems that Umeå appears outstanding because a steady decreasing score can be identified between the remaining regions while the largest gap can be found between Umeå and Luleå/Boden which is second in the index. Investigating the composition of the public services, it becomes evident that Umeå has a higher share of employment within college activities. For a region like Umeå, a large university will have a considerable impact on the employment level within the industries that the PPI represents.

This brings us to one of the important biases that the PPI meets. In a welfare society like the Swedish, the welfare supply is to a large degree based on decisions taken by the national government. Central decisions and laws determine a minimum supply of welfare goods. Therefore the differences on basics like schools, kindergartens and homes for the elder population are minimal. Regions can, however, differ when it comes to activities like colleges, universities or hospitals because these are not located in every region and because they are located based on politics on a larger scale. Finally, it has to be stressed that a high PPI also indicates that the region is less dominated by the private business sector.

Another problem that has to be taken into account is that the index is not sensitive to economies of scale. Basic public activities have to be fulfilled regardless of the number of citizens in a region or a municipality. The larger a population is, the easier it is to improve the efficiency in for example administration. The more densely populated an area is, the easier it will be to raise efficiency in the public sector. Consequently, the index will cause densely populated regions to score low while sparsely populated regions will have better chances of scoring high. Finally, the PPI indicates nothing about the scope, quality and efficiency of the services provided.

Examining the development within the PPI, table 4.2 tells of large differences in the development within the last 9 years. Here it is important to stress that the regions with a modest number of employed in the public sector in 1993 will more easily obtain large percentage changes within the period. If this is taken into account, especially Uppsala and Gothenburg have witnessed considerable changes in the employment in the public provision industries. In general, primary education (SNI 801) has witnessed a considerable increase, but it has almost doubled in both Uppsala and Gothenburg. Meanwhile, human health activities (SNI 851) and social work activities (SNI 853) have decreased – though not to the same degree. This is a weak indication of relocation of governmental founding from healthcare into education - and especially primary educations. Again this can be seen as a weak indication of Sweden's desire to develop into a knowledge intensive society.

This asks for a short remark: Aiming toward building a knowledge intensive society and alongside cutting down on some of the fundamentals in the welfare system such as healthcare can have fatal consequences if public provision is important. The attractiveness on creative people and talents can easily decrease.

Cultural Opportunity

While the Public Provision Index is a proxy for the public service level of a particular region, the Cultural Opportunity Index (COI) should be seen as an attempt to measure the cultural supply within a region. The COI is developed to indicate the differences in the level of cultural opportunities between regions, and is measured as people employed in the cultural industries by every 100 inhabitants. This index includes the cultural economy, that is film and video production, museums, libraries, theatres etc., but also amenities that make a city life more attractive and cosy. Therefore employment in bars, restaurants, sports activities etc. are included too.

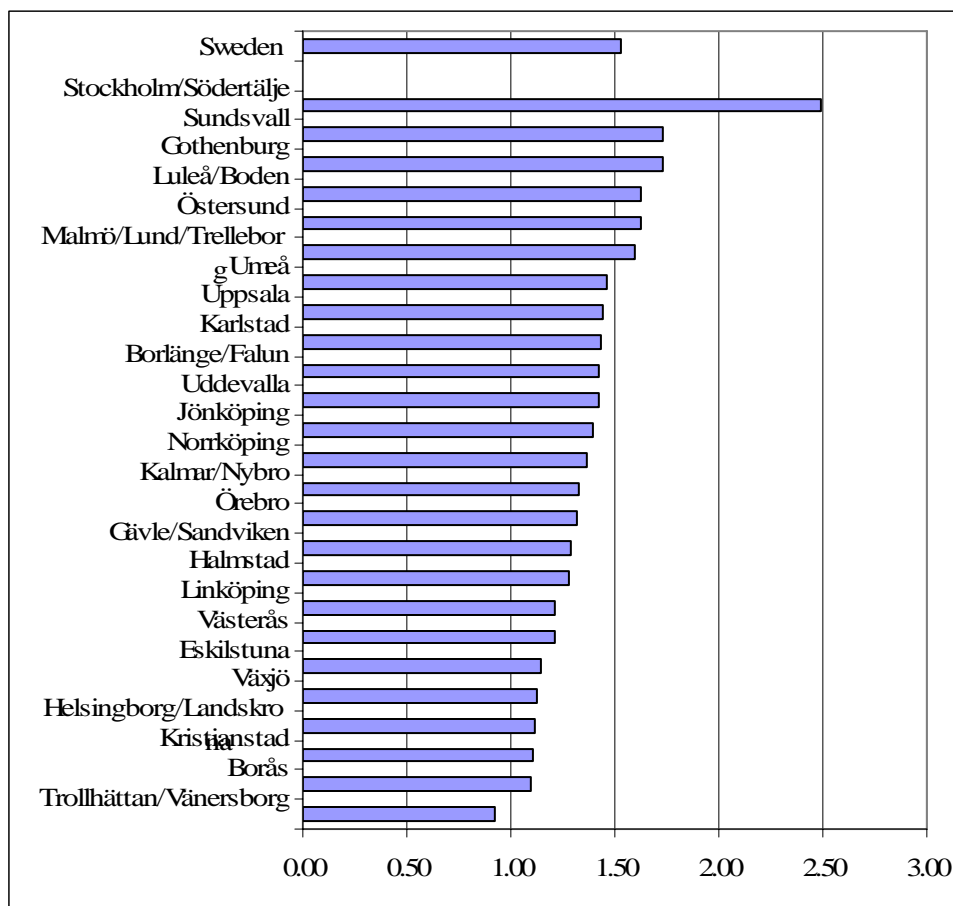


Figure 4.5: Cultural Opportunity Index 2002*

*Table 6 in Appendix 1 provides an overview of the industries included in the Cultural Opportunity Index

Figure 4.5 shows that Stockholm has the far highest share of people employed within cultural industries. This is expected as metropolitan areas are often the leading cultural centres of a country. At the same time, capital cities are often the most visited by tourists and therefore also the biggest market for suppliers of amenities.

Looking at the rest of the regions, Gothenburg, Malmö/Lund/Trelleborg are still coming out high on the list but Sundsvall, Luleå/Boden and Östersund rank high on the list as well. These three regions all have a relatively higher share of the cultural opportunity employment in sporting activities (SNI 926) than Stockholm, Gothenburg and Malmö/Lund/Trelleborg, which indicates that the population here is either more engaged in sporting activities or – which probably is the case – that active holidays like fishing, hiking, skiing or the like are important for the regions' economies.

Table 4.3: Cultural Industries. Percentage changes in employment 1993-2002

| Region | Changes 1993-2002* |
|------------------------|---------------------------|
| <i>Sweden</i> | <i>35.47</i> |
| Uddevalla | 56.89 |
| Sundsvall | 51.18 |
| Örebro | 47.76 |
| Trollhättan/Vänersborg | 45.43 |
| Linköping | 44.94 |
| Umeå | 40.66 |
| Malmö/Lund/Trelleborg | 39.43 |
| Gothenburg | 39.24 |
| Stockholm/Södertälje | 38.48 |
| Kalmar/Nybro | 37.59 |
| Östersund | 36.45 |
| Borlänge/Falun | 33.73 |
| Uppsala | 32.57 |
| Gävle/Sandviken | 31.09 |
| Jönköping | 28.95 |
| Luleå/Boden | 27.63 |
| Borås | 26.94 |
| Karlstad | 26.90 |
| Kristianstad | 26.36 |
| Eskilstuna | 25.34 |
| Halmstad | 25.27 |
| Helsingborg/Landskrona | 25.08 |
| Norrköping | 22.96 |
| Växjö | 19.20 |
| Västerås | 14.24 |

*Data shall be taken with some caution due to a shift in the Swedish classification nomenclature (SNI) in 2002 that can cause some differences in the classification of the industries between years 1993 and 2002.

Addressing the development within the cultural industries, table 4.3 shows that Uddevalla, Sundsvall and Örebro have had the most significant changes in employment in the cultural industries within the period that we are analysing. In general the increase in jobs has been notable. Even large urban areas as Stockholm, Gothenburg and Malmö/Lund/Trelleborg have witnessed an increase of approximately 40%. This is one of several indications of Sweden slowly approaching a cultural consuming economy – like many other western countries.

Additionally, the increasing economic conjunctures of Sweden of course play a role as well. The cultural consumption industries are among the first that are affected by increasing or decreasing economic structures as the industries sell goods and services that are dispensable.

Figure 4.6 shows that besides the six city regions topping the list, Mora, which is not one of the 25 largest regions and only has approximately 45.000 inhabitants, also appears in the top. Mora has the highest ranking on the Cultural Opportunity Index (3.17). This can most likely be explained by the ski sport activities that are important for the region.

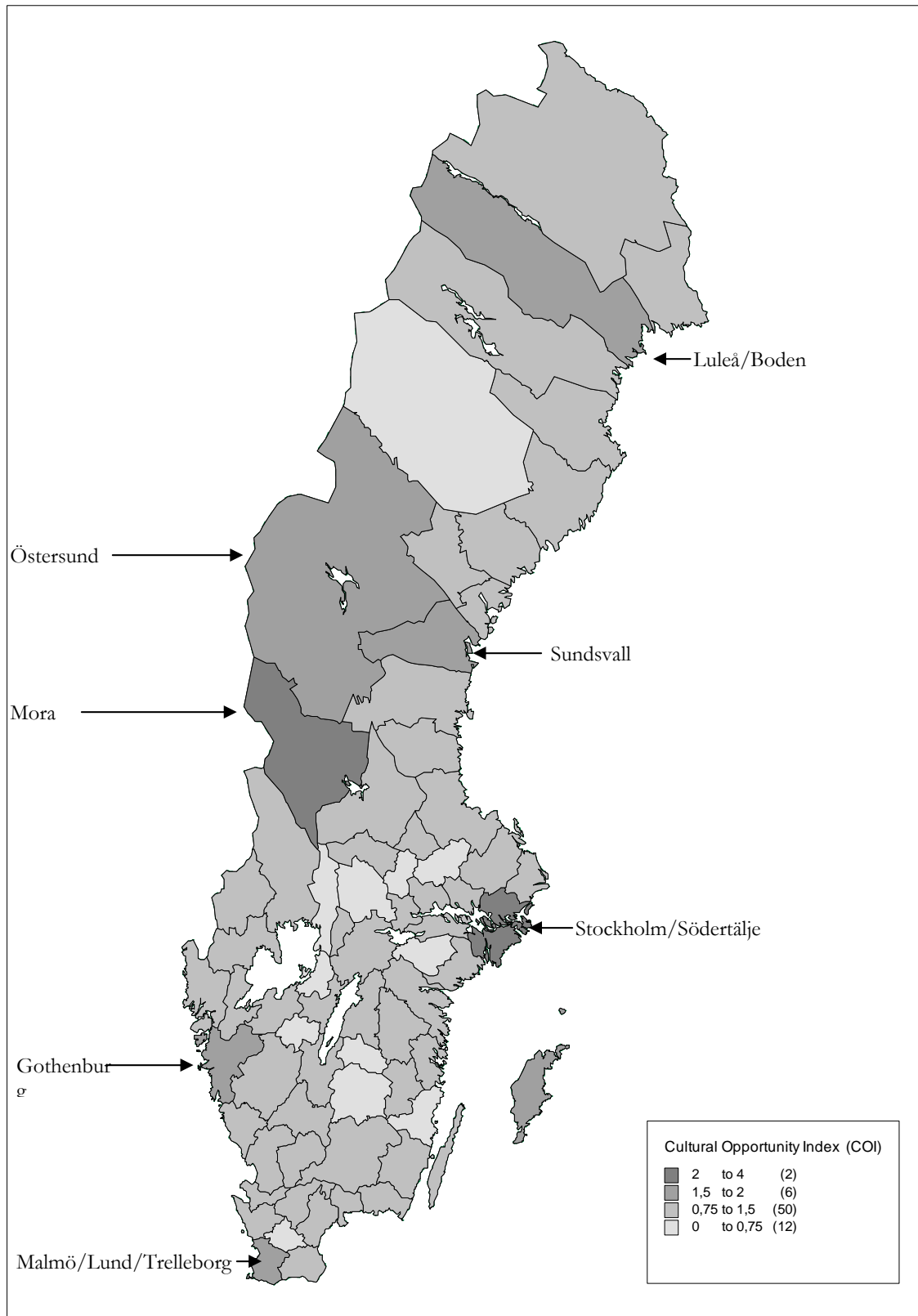


Figure 4.6: Cultural Opportunity Index. The geographical pattern in Sweden 2002

People Climate in the Nordic Countries

In a Nordic perspective, the people climate indicators tell somewhat the same story – regions that have a high share of creative class persons also have fairly good people climate indicators. It is, however, not only large urbanised areas that come out with good scores. Both in Sweden and in Denmark small regions interfere. Enköping and Marstal do not qualify among the largest and most urbanised regions. They do, however, come out with the best creative class scores – relatively. Enköping is located close to Stockholm and Uppsala, which is why we can expect the region to serve as a residence area for creative class people working in Stockholm or Uppsala. Contrastingly, the explanation for the high creative class score in Marstal is beyond the scope of this report, but we can verify that the creative class variable is the only variable where these two regions get good scores. In all other indexes the regions score below the large regions.

Besides the interfering Enköping and Marstal regions, table 4.4 tells a story that has strong parallels to the Swedish. The large urban areas tend to have good scores in the Talent, Bohemian, Openness 2 and COI indexes whereas the PPI tend to have higher values in regions that are less densely populated. The general findings of the Nordic data – when the scores are not sorted by creative class – have to be that the large regions, and in particular the capital regions, are dominating the People Climate Index. It is the densely populated regions that attract bohemians; that attract people originating from abroad; that attract talent, and that have the highest shares of people employed in cultural related jobs.

The table, however, also witnesses considerable variations across countries – even within Scandinavia. Some of the variations have to be found in different ways of gathering data. In Norway for example, the public sector is not included in the occupational data, which causes a significantly lower share of creative people. Other explanations shall be found in different industrial structures, e.g. Danish industry is closely linked to service and is dominated by small and medium sized enterprises whereas the Swedish industry is more dominated by capital intensive or R&D intensive production and dominated by medium and large size enterprises. This results in a need of different labour qualifications across the countries and when a different pattern of urbanisation can be identified between the countries as well due to differences in the physical landscape then variations occurs.

Table 4.4 People climate indicators in the Nordic regions sorted by creative class

| | Creative class (%) | Talent (%) | Bohemian (LQ) | Openness 2 | PPI | COI |
|----------------------|-----------------------|------------|------------------|------------|-------|------|
| SWEDEN | | | | | | |
| Enköping | 46.74 | 9.50 | 0.87 | 9.73 | 9.49 | 0.87 |
| Uppsala | 45.59 | 23.73 | 1.00 | 12.65 | 13.67 | 1.47 |
| Stockholm/Södertälje | 40.04 | 19.92 | 1.82 | 18.40 | 10.68 | 2.53 |
| Linköping | 38.09 | 18.01 | 0.61 | 8.59 | 13.70 | 1.23 |
| Göteborg | 36.78 | 16.95 | 1.10 | 14.55 | 12.01 | 1.76 |
| DENMARK | | | | | | |
| Marstal Region | 53.31 | 1.42 | 0.43 | 2.28 | 11.71 | 2.01 |
| Copenhagen Region | 52.51 | 8.27 | 1.43 | 6.77 | 12.69 | 2.34 |
| Aarhus Region | 48.58 | 7.91 | 1.25 | 4.77 | 14.83 | 1.86 |
| Svendborg Region | 47.21 | 2.79 | 0.90 | 3.71 | 14.42 | 1.43 |
| Sønderborg Region | 42.65 | 3.44 | 0.59 | 4.77 | 11.79 | 1.16 |
| NORWAY | | | | | | |
| Bærum/Asker | 26.32 | 29.76 | 1.30 | 8.47 | 13.27 | 1.21 |
| Kongsberg | 20.58 | 20.40 | 0.75 | 4.31 | 13.48 | 1.06 |
| Oslo | 18.74 | 39.28 | 2.18 | 15.42 | 14.23 | 3.69 |
| Arendal | 15.35 | 14.55 | 0.42 | 4.26 | 12.15 | 1.13 |
| Stavanger/Sandnes | 15.10 | 20.34 | 1.04 | 6.67 | 11.62 | 1.63 |
| FINLAND | | | | | | |
| Helsinki | 46.10 | 20.26 | 1.75 | 4.03 | 9.96 | 2.50 |
| Oulu | 41.32 | 16.91 | 0.82 | 1.12 | 11.46 | 1.42 |
| Jyväskylä | 40.01 | 15.59 | 0.91 | 1.72 | 10.88 | 1.55 |
| Kuopio | 39.11 | 13.02 | 0.86 | 1.06 | 12.02 | 1.22 |
| Tampere | 39.34 | 15.30 | 1.26 | 2.04 | 10.09 | 1.82 |

Source: The Nordic Database

Summing Up on People Climate

Summing up, chapter 4 has provided a descriptive analysis of the geography of people climate in contemporary Sweden. By using different variables as proxies for tolerance and quality of place the people climate concept has been challenged in an attempt to get as nuanced a result as possible. Many different proxies especially for the tolerance part are applied to secure that big city phenomena, like ethnic ghettos, do not have too much effect on the entire evaluation.

Having taken all these precautions, we believe that we have provided a fair picture of the geography of factors that influence people climate, and, hence, the attractiveness of regions. But a people climate cannot force economic growth by itself. An entrepreneurial and dynamic business climate needs to be present too. Therefore the business climate is

explored in the following to be able to provide a more complete portrait of the creative state of the Swedish regions.

5. Business Climate

To become a successful region, a broad variety of elements have to interact in a successful way. Contemporary research points towards a positive impact on economic growth if active support is given to bridge businesses, government institutions and institutions of education. Especially in the knowledge intensive industries, effects of this seem powerful when examples like Silicon Valley are mentioned.

In chapter 3 we mapped the geography of the creative class and the talented workforce. These are essential for understanding the qualifications of the workforce within a region. Further, the general skills of the workforce and the traditions of production within a region are important for developing, planning and branding a region. The qualifications of the workforce have to meet the needs of businesses, and the job offers of businesses have to meet the qualifications of the workforce.

In chapter 4 we explored indicators of people climate based on a belief that certain elements have an attractive effect on creative and talented people. In the following, indications of business climate in the Swedish labour market regions will be analysed. By combining business climate with people climate and the location of talent and creative people, we aim to point towards a multi-levelled analysis of the possibilities and competitiveness of the Swedish regions in a knowledge based economy.

Only two indicators are found suitable for indicating the state of the business climate. The first is the Tech Pole Index which indexes the location of high-tech production in a national perspective. The other is the firm formation rate which indicates the entrepreneurial spirit in a region as a proxy for the business climate.

The Tech-Pole Index - Knowledge Based Production

Florida refers to the importance of high-tech industries in building a competitive region. An indicator of the importance of a region's high-tech production is measured by the Tech-Pole Index. Here we also use the Tech-Pole Index as a measure of the importance of high-tech production, but contrary to Florida we add knowledge intensive business services and the automotive industry¹⁰ to the original list made by DeVol (1999). These additions include consultancy services and research and development. We do, however, still use the term the Tech-Pole Index. By regulating DeVol's original index, we believe that we have transformed the index into a measure that is better fit for a European context

¹⁰ Automotive industries can be considered very knowledge intensive and innovative in Sweden. Business services also consist of a high degree of knowledge intensity in Europe.

as the high-tech production in Europe is not as dominating and as widely spread as in the USA.

Statistically, knowledge intensive production is illustrated by the number of employees within the defined categories. A list of the included categories can be seen in Appendix 1 in table 2. Comparing employment in the high-tech industries is not unproblematic. The ten- year period that we are covering represents a change in the industrial nomenclature in Sweden. 1993 and 1997 are categorised by SNI92 (Swedish Nomenclature for Industries) whereas 2002 is categorised by SNI2002. This shift in nomenclatures causes some problems when comparing 1993 and 1997 with 2002; especially if changes in single industries are investigated. However, though being aware that the changes from 1993 to 2002 result in somewhat uncertain data, data can easily be used to illustrate the growth in the high-tech and knowledge intensive businesses as an indication of the regional development within these industries. Further, it has to be stressed that the adjusted high-tech/knowledge intensive production in Sweden only counts 10% of the total employment, thus 90% is not addressed with this index.

Table 5.1 shows the shares and LQ of employment in high-tech industries in Sweden. Trollhättan/Vänersborg are in a clear lead with an LQ of 2.33, more than 0.5 points higher than number two on the list - Linköping. Trollhättan/Vänersborg have a very high share of the employed population employed in manufacturing of motor vehicles (13.6%) and also a considerable share of employment in manufacturing of aircrafts and spacecrafts (4.6%). Linköping, Uppsala, Gothenburg, Stockholm/Södertälje, Umeå and Malmö/Lund/Trelleborg are the only other regions that have an LQ higher than 1. All have the highest concentrations of employment within public service and administration and none of them have LQs close to Trollhättan/Vänersborgs in terms of non-public sectors.

Table 5.1 also reveals that the growth in high-tech employment takes place in regions that already have high concentrations of high-tech industries. This correlates with the vast literature in contemporary economic geography on clusters, path dependency, regional systems of innovation, localised learning etc., see Malmberg and Maskell (2002), Maskell & Malmberg (1999), Asheim (1996), Storper 1997, Storper and Vennables (2004), Cooke & Morgan (1998).

Tabel 5.1: Hightech employment. Shares of total employment and LQs in Swedish regions

| City Region | 1993* | 1997* | 2002* | Percentage change 1993-2002 | Location quotient 2002 |
|------------------------|--------------|--------------|--------------|--|-----------------------------------|
| <i>Sweden</i> | <i>7.70</i> | <i>9.22</i> | <i>9.49</i> | <i>8.49</i> | <i>1.00</i> |
| Trollhättan/Vänersborg | 20.53 | 22.60 | 22.09 | 21.09 | 2.33 |
| Linköping | 15.77 | 19.49 | 17.17 | 16.17 | 1.81 |
| Uppsala | 13.15 | 14.96 | 15.76 | 14.76 | 1.66 |
| Gothenburg | 11.74 | 14.22 | 15.24 | 14.24 | 1.61 |
| Stockholm/Södertälje | 11.22 | 12.85 | 13.56 | 12.56 | 1.43 |
| Umeå | 6.92 | 9.31 | 10.36 | 9.36 | 1.09 |
| Malmö/Lund/Trelleborg | 6.80 | 7.89 | 9.73 | 8.73 | 1.03 |
| Luleå/Boden | 6.02 | 7.88 | 8.19 | 7.19 | 0.86 |
| Växjö | 5.71 | 7.87 | 7.81 | 6.81 | 0.82 |
| Västerås | 8.03 | 12.45 | 6.88 | 5.88 | 0.73 |
| Eskilstuna | 4.85 | 6.86 | 6.74 | 5.74 | 0.71 |
| Uddevalla | 5.58 | 6.85 | 6.61 | 5.61 | 0.70 |
| Borås | 4.97 | 6.57 | 6.60 | 5.60 | 0.70 |
| Jönköping | 5.64 | 6.91 | 6.52 | 5.52 | 0.69 |
| Sundsvall | 5.97 | 8.66 | 6.50 | 5.50 | 0.68 |
| Karlstad | 4.70 | 5.74 | 6.16 | 5.16 | 0.65 |
| Örebro | 5.11 | 7.88 | 6.05 | 5.05 | 0.64 |
| Helsingborg/Landskrona | 5.69 | 6.18 | 5.85 | 4.85 | 0.62 |
| Kalmar/Nybro | 6.19 | 5.40 | 5.83 | 4.83 | 0.61 |
| Gävle/Sandviken | 4.82 | 6.23 | 5.78 | 4.78 | 0.61 |
| Östersund | 4.11 | 5.08 | 5.59 | 4.59 | 0.59 |
| Kristianstad | 3.44 | 4.17 | 5.24 | 4.24 | 0.55 |
| Borlänge/Falun | 4.36 | 4.89 | 5.07 | 4.07 | 0.53 |
| Norrköping | 6.90 | 6.98 | 4.38 | 3.38 | 0.46 |
| Halmstad | 2.96 | 3.76 | 3.86 | 2.86 | 0.41 |

*A change in the industrial nomenclature in 2002 (from SNI92 to SNI2002) is causing some comparable difficulties between data from 1993 and 1997 on the one side and 2002 on the other. The differences between the two nomenclatures are, however, not more influential than data can be compared in general terms as is the case here.

The LQ provides an indication of the relative importance of a variable for the region compared to other regions (in this case the variable is high-tech/knowledge intensive employment). However, it has the weakness of not really showing the region's importance to the total national production. To be able to do so, DeVol (1999) has developed the Tech Pole Index. According to him, multiplying the region's share of the national high-tech employment with the region's LQ results gives a more accurate measure of the region's national importance.

The Tech-Pole Index is graphically shown in figure 5.1. Linköping, Uppsala and Gothenburg all have a larger share of their labour force employed in high-tech industries than Stockholm; but the Tech-Pole Index shows that the most important national share of the high-tech employment is located in Stockholm representing almost twice the value of Gothenburg. Gothenburg, Trollhättan/Vänersborg, Uppsala, Malmö/Lund/Trelleborg and Linköping follow Stockholm as the most important high-tech regions in terms of employment.

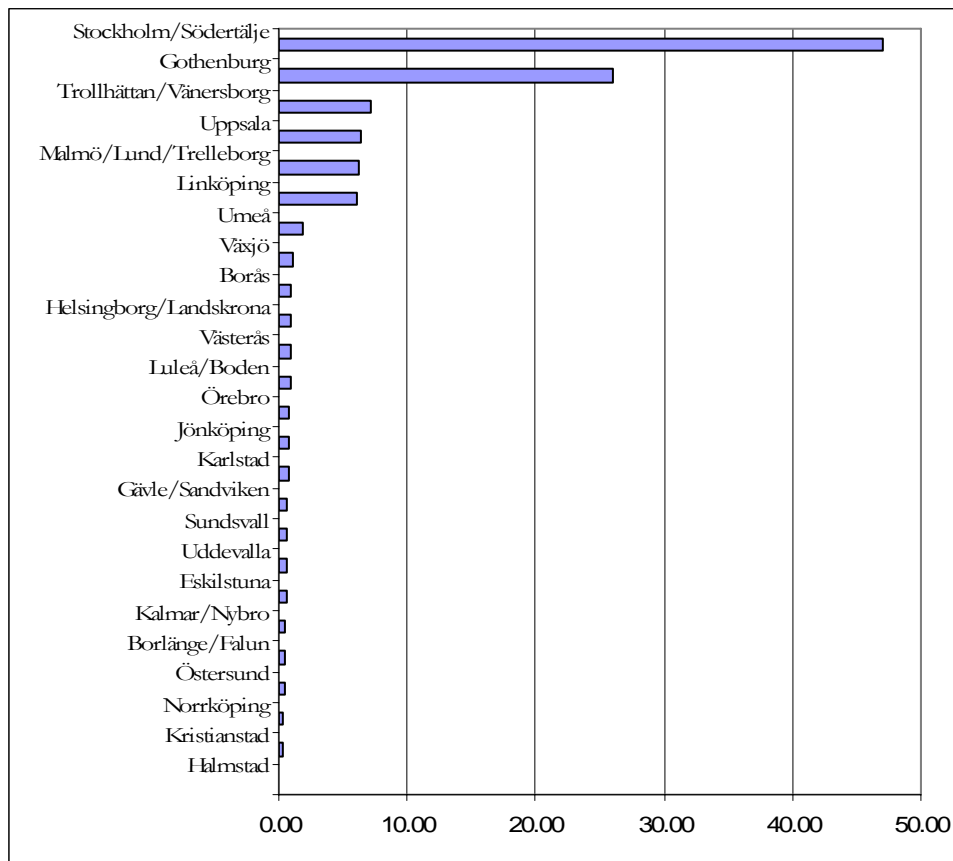


Figure 5.1: Tech-Pole Index for 2002

Umeå is represented with an LQ above 1 and ranks above Malmö/Lund/Trelleborg. In the Tech-Pole Index, Umeå is not a part of the six dominating regions and is more close to Växjö and Borås than to any of the other six regions that have an LQ above 1. This is a good example of a region that obtains good scores on the LQ but on a national level is less important. Hence, it would be fair to say that though high-tech industries are important for the Umeå region, the Tech-Pole Index indicates that *ceteris paribus* the high-tech industries in Umeå are less important for the overall Swedish high-tech sector.

The Tech-Pole Index demonstrates the same overall picture as the majority of the former indexes. The largest regions: Stockholm, Gothenburg, Malmö/Lund/Trelleborg and

Uppsala achieve high scores. Helsingborg/Landskrona is not performing as well as the size of the region leads to expect – but this has also been the case in many of the former indexes. Further, some regions that have not performed outstanding on the prior indexes are getting high scores on this index – this is especially Trollhättan/Vänersborg and to some extent Linköping.

The findings of the Tech-Pole Index are plotted into a map of Sweden in figure 5.2. The figure clearly indicates that very few regions in Sweden have major importance in a national perspective – in terms of employment – a large majority have very low Tech-Pole scores.

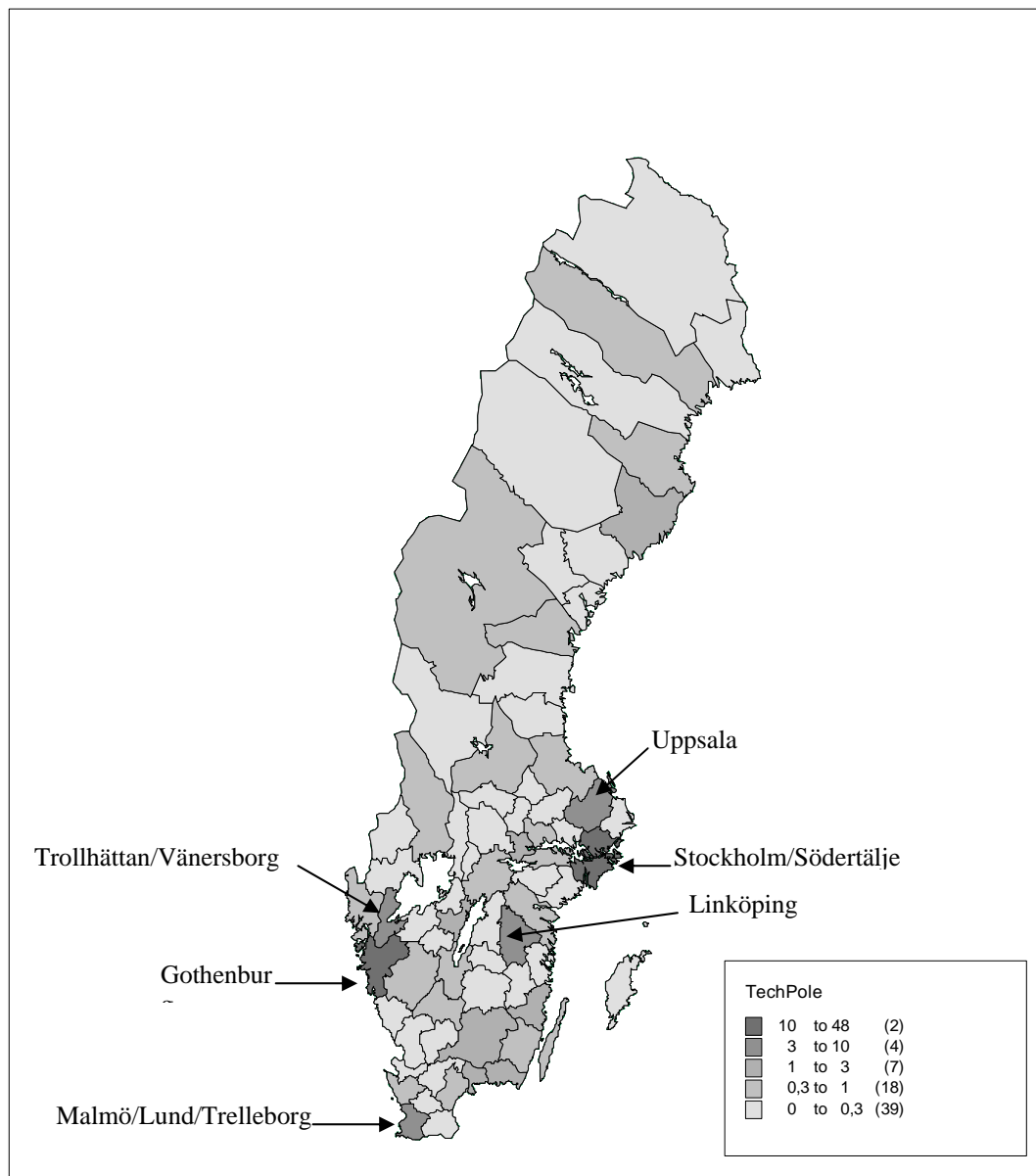


Figure 5.2: The geographical pattern of the Tech-Pole Index in Sweden 2002

Analysis of figure 5.2 gives the impression that high-tech production is concentrated in the southern parts of Sweden. The two darkest tones of grey are only found in this area whereas the middle grey tone is represented once in the northern Sweden – by Umeå. In general, the map shows what could be expected: that it is the largest city areas that dominate the high-tech production; that the high-tech production in general is located in areas that have a high population density; and that national centres of high-tech/knowledge based production are in the southern parts of Sweden – the regions below Uppsala.

A business climate shall, however, not only be an indication of the high-tech level in the region. Therefore we have added a second variable to play up against the Tech-Pole Index.

Formation of New Firms

The future economic perspective of a region is naturally very difficult to predict. One of the aims for this report is to look for possible relations between the geography of the creative class in Sweden and economic dynamics. Investigating the new firm formation rate brings along a proxy for the entrepreneurial spirit within a region, and this can be used as a proxy for the economic climate. This is based on the assumption that a positive business climate will result in a growing entrepreneurial spirit, which again produces a growing formation of new firms. The New Firm Formation Index is measured as new firms per 1000 inhabitants.

Table 5.2 shows that the usual suspects have top rankings in this area too. Östersund has, however, managed to climb the list, capturing a second price. Östersund has been listed in the bottom of the list in many of the prior indicators but came out third on the Public Provision Index and fifth on the Cultural Opportunity Index. However, in general it seems that firm start-ups are more frequent in regions that already have stable economic conditions. Table 5.2 also gives information on the new firm formation within high-tech firms. Though the regions are not sorted ascending or descending according to the high-tech firm formation, it soon becomes clear that only the Stockholm/Södertälje region has a value well above the remaining regions and that only Malmö/Lund/Trelleborg, Gothenburg and Uppsala have a firm formation rate above the national average.

Looking at the LQ for high-tech employment on a national level, Stockholm, Gothenburg, Malmö and Uppsala do not appear as the highest ranking. They do, however, all have an LQ above 1. When this is combined with the high-tech firm formation rate, it indicates that high-tech growth – at least in terms of new firm formation

– seems to gravitate towards the four largest regions in Sweden and, consequently, centralise more than is already the case.

Table 5.2: The New Firm Formation Index 2002

| Region | New firms per 1000 inhabitants | New high-tech firms per 1000 inhabitants |
|------------------------|---|---|
| <i>Sweden</i> | <i>6.96</i> | <i>0.56</i> |
| Stockholm/Södertälje | 9.33 | 1.04 |
| Östersund | 9.07 | 0.40 |
| Malmö/Lund/Trelleborg | 7.53 | 0.69 |
| Uddevalla | 7.27 | 0.29 |
| Gothenburg | 7.14 | 0.69 |
| Uppsala | 6.97 | 0.59 |
| Helsingborg/Landskrona | 6.66 | 0.48 |
| Kristianstad | 6.50 | 0.30 |
| Borlänge/Falun | 6.35 | 0.43 |
| Sundsvall | 6.19 | 0.52 |
| Luleå/Boden | 6.17 | 0.47 |
| Örebro | 6.15 | 0.42 |
| Halmstad | 6.13 | 0.39 |
| Kalmar/Nybro | 6.08 | 0.40 |
| Karlstad | 6.00 | 0.38 |
| Västerås | 5.93 | 0.55 |
| Borås | 5.72 | 0.29 |
| Växjö | 5.70 | 0.46 |
| Eskilstuna | 5.70 | 0.46 |
| Gävle/Sandviken | 5.48 | 0.42 |
| Linköping | 5.48 | 0.50 |
| Umeå | 5.39 | 0.40 |
| Norrköping | 5.39 | 0.33 |
| Jönköping | 5.20 | 0.39 |
| Trollhättan/Vänersborg | 5.01 | 0.29 |

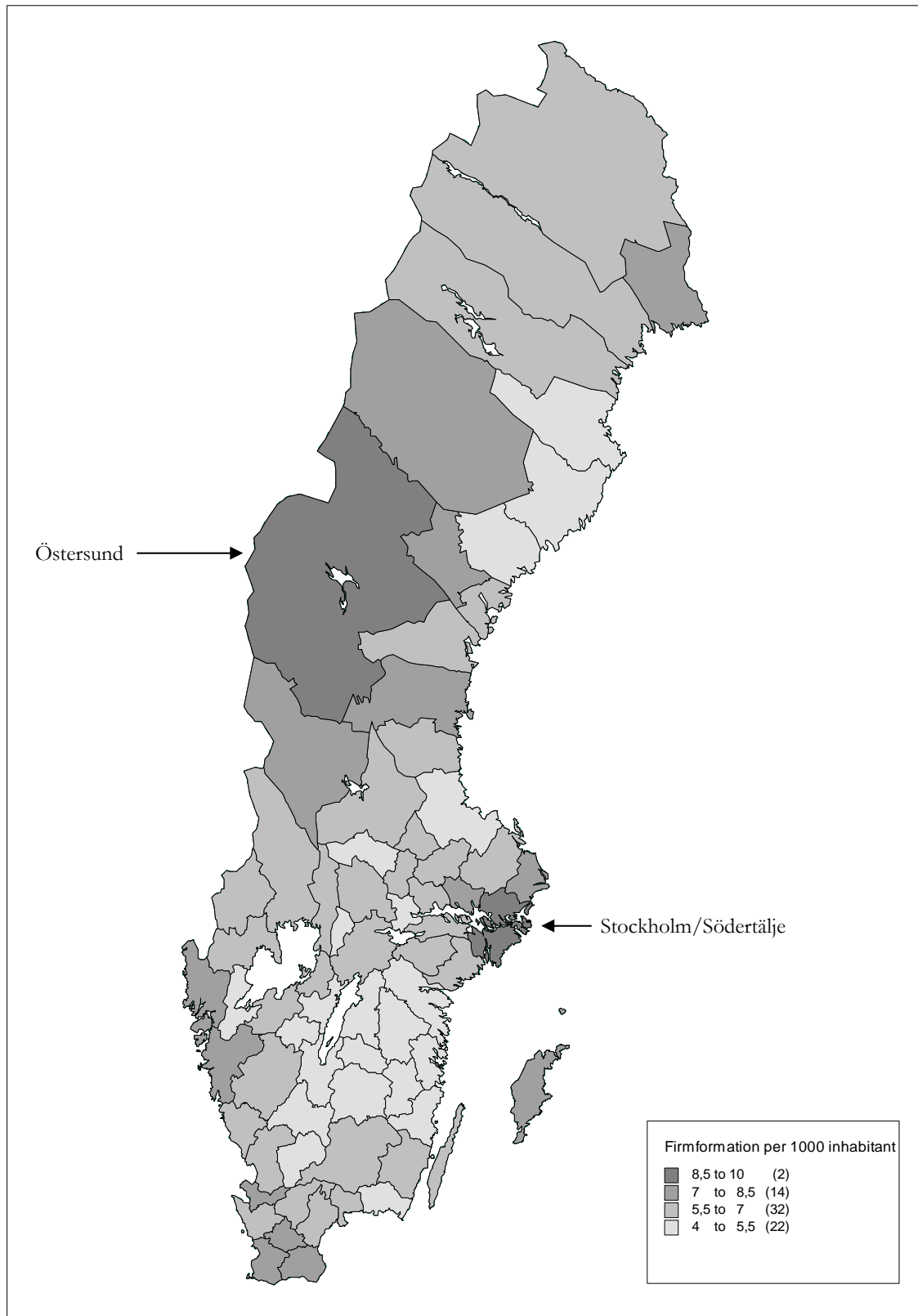


Figure 5.3: The geographical pattern of the New Firm Formation in Sweden 2002

Figure 5.3 provides a geographical expression of the new firm formation activities in Sweden. The map differs from the prior maps by the rather high ratings of the more peripheral regions in especially northern Sweden. The map provides us with a different impression than if only the 25 largest regions were investigated. If we look more into the types of industries that emerge in the northern parts of Sweden, farming of different kinds, forestry, hotel and restaurant activities and letting of own properties are dominating. Only Östersund has considerable growth in an industry that reflects the knowledge based economy – namely business service (SNI 741). This brings us to conclude that even though the northern parts of Sweden have good ratings in the New Firm Formation Index, the firms that emerge in the peripheral regions are not firms that create a large number of new jobs and do not have considerable potential of growth within the near future years. Hence, even though the peripheral regions appear high in the New Firm Formation Index, they do not bring any competitive aspects to the general picture presented in the indexes discussed earlier.

Business Climate in the Nordic Countries

In the Nordic countries the regional structure is very similar. The capital is the economic leader and the largest urban areas follow. Exposing the Tech Pole Index to the four Nordic countries that participate in the project displays this pattern. Though for example Bærum/Asker in Norway comes out best and Tronhättan/Vänersborg comes in third in Sweden, it is the largest agglomerations that are represented. Further Bærum/Asker is located close to Oslo and is included in the greater Oslo area. The result is, however, clear – high-tech employment is located in the city or city near regions.

The data in table 5.3 shows that one (in the case of Norway two) regions has by far the highest score on the Tech Pole Index, and it is very clear that a large gap can be identified between the leading region(s) and the followers. This is an indication of an explicit dominance by very few regions and a tendency to agglomeration among high-tech producers. The scores are not directly comparable across nations. They can, however, be used to show a very similar national hierarchy in all the Nordic countries where the capital cities, Stockholm, Copenhagen, Helsinki and the Oslo regions, are dominating in this context.

Table 5.3: Tech Pole 2002 for the Nordic Countries

| Sweden | | Denmark | | Norway | | Finland | |
|------------------------|-------|-------------------|-------|-------------------|-------|----------|-------|
| Stockholm/Södertälje | 47.11 | Copenhagen Region | 87.42 | Bærum/Asker | 53.04 | Helsinki | 62.82 |
| Göteborg | 26.02 | Aarhus Region | 13.87 | Oslo | 50.94 | Oulu | 13.98 |
| Trollhättan/Vänersborg | 7.23 | Vejle Region | 2.32 | Trondheim | 9.64 | Tampere | 11.74 |
| Uppsala | 6.34 | Kolding Region | 2.11 | Stavanger/Sandnes | 9.41 | Turku | 7.30 |
| Malmö/Lund/Trelleborg | 6.18 | Odense Region | 1.98 | Bergen | 8.51 | Salo | 5.30 |

Source: Nordic Database

The firm formation variable is not available for all the Nordic countries and, hence, the only indicator of business climate is the above presented Tech Pole Index. But it can be concluded that the picture that Sweden provides is also the tendency that characterises the Nordic countries in general in regard to business climate.

Summing Up on the Business Climate

Summing up on the findings of the indicators of the business climate, the general impression does not differ considerably from the results of the people climate. Though regions like Trollhättan/Vänersborg, Linköping and Östersund are performing well, the four largest Swedish regions – Stockholm/Södertälje, Göteborg, Malmö/Lund/Trelleborg and Uppsala – also get high ratings. This brings us to conclude that based on this descriptive analysis, the cities performing best in the people climate also perform best in the business climate. Based on the analysis of business climate and people climate, we next turn to an overall ranking of the best performing regions in Sweden based on the indexes investigated above.

6. Ranking the Swedish regions: Technology, Talent and Tolerance

Based on the results so far, we can rank the Swedish regions in relation to their respective scores on the people climate and the business climate indicators. Doing so, we can give a very quantitative impression of the interregional performance of the Swedish labour market regions without weighting the indexes, except the Openness 1 and 2 and Integration indexes. The scores on each index is added up to a sum and next given an indexed score based on the score of the top scoring region.

Table 6.1 is based on the ranking by indicators on all 70 Swedish labour market regions. The table shows that based on the above indicators, Uppsala comes out as the most creative region closely followed by Stockholm, Malmö and Gothenburg. Though Stockholm has performed best on most of the indicators, it only comes out second. This solely results from the rather poor rating that Stockholm obtains in the PPI. Consequently, Uppsala comes out first. Uppsala has a stable high score in most of the indexes and has a relative good performance in the PPI in opposition to Stockholm, Malmö and Gothenburg – which basically settles the ranking.

As discussed in chapter 4, the PPI might be affected by some kind of economies of scale in the public services. The welfare system can cause rather high rates of public servants within rural or less urbanised areas because the welfare system secures an equal supply of public services, no matter whether you are located in a densely or dispersal populated area. Hence, this indicator is highly sensitive to politics and is evenly spread due to this. Accordingly, some might argue that the indicator is meaningless to add to an analysis like this. We find the index relevant in the sense that a high public service level can have an attractive effect on creative people who want good schools for their children and good elder service when they reach the level where this is necessary. However, leaving the PPI out of the ranking brings Stockholm to the first position with a significant gap down to Uppsala, Gothenburg and Malmö in the following positions.

Whether this creative class model is adaptable to the Swedish context or not and to what degree the model can explain current economic development in Sweden will be the focus of the following two chapters. However, it should be underlined that the above ranking according to the creative class approach only explains some of the many influencing elements that have an impact on regional growth. Therefore, the above list is not a deterministic list of regions that may or may not perform well in the near future. The list is an estimated picture on favoured and less favoured regions based on the current state of the Swedish regions. It indicates to which degree regions are geared for the more innovative and knowledge intensive dynamics of the emerging mode of production. Hence, new technological breakthroughs, crises in the world economy or even a locally

founded firm with a brilliant idea can change the ranking that is presented above – especially for the regions that are listed below the four leading regions.

Table 6.1: Ranking the Swedish labour market regions by total creativity score*

| A-Region | Creative Class LQ | Bohemian LQ | Tech-Pole | Talent | Openness 1 | Openness 2 | Integration | PPI | COI | Firms per 1000 inhabitants | Aggregated Competitive Index |
|------------------------|----------------------|----------------|-----------|--------|------------|------------|-------------|-----|-----|----------------------------------|------------------------------------|
| Uppsala | 66 | 66 | 67 | 70 | 69 | 61 | 36 | 64 | 61 | 54 | 100 |
| Stockholm/Södertälje | 70 | 70 | 70 | 69 | 70 | 70 | 43 | 13 | 69 | 70 | 98 |
| Malmö/Lund/Trelleborg | 68 | 69 | 66 | 67 | 67 | 68 | 2 | 52 | 63 | 64 | 97 |
| Gothenburg | 69 | 68 | 69 | 65 | 68 | 65 | 11 | 33 | 67 | 57 | 94 |
| Luleå/Boden | 60 | 65 | 54 | 64 | 36 | 18 | 59 | 67 | 65 | 39 | 89 |
| Umeå | 51 | 64 | 61 | 68 | 56 | 24 | 49 | 70 | 62 | 16 | 86 |
| Östersund | 52 | 58 | 45 | 52 | 6 | 9 | 63 | 57 | 64 | 69 | 82 |
| Västerås | 65 | 53 | 55 | 63 | 66 | 67 | 34 | 34 | 46 | 31 | 81 |
| Linköping | 64 | 45 | 65 | 66 | 62 | 43 | 10 | 62 | 47 | 21 | 81 |
| Örebro | 48 | 49 | 53 | 61 | 65 | 55 | 5 | 63 | 53 | 37 | 80 |
| Växjö | 55 | 67 | 59 | 58 | 53 | 46 | 50 | 45 | 36 | 27 | 79 |
| Sundsvall | 63 | 54 | 49 | 48 | 41 | 12 | 45 | 38 | 68 | 40 | 77 |
| Jönköping | 58 | 48 | 52 | 60 | 63 | 54 | 30 | 49 | 56 | 11 | 77 |
| Borlänge/Falun | 45 | 61 | 44 | 51 | 43 | 17 | 32 | 59 | 59 | 42 | 77 |
| Halmstad | 47 | 57 | 36 | 54 | 47 | 56 | 31 | 50 | 50 | 36 | 75 |
| Nyköping | 59 | 52 | 34 | 45 | 51 | 48 | 62 | 27 | 49 | 48 | 74 |
| Borås | 50 | 59 | 57 | 31 | 57 | 60 | 47 | 51 | 33 | 28 | 74 |
| Karlstad | 54 | 56 | 51 | 59 | 44 | 22 | 8 | 40 | 60 | 33 | 73 |
| Helsingborg/Landskrona | 57 | 63 | 56 | 53 | 59 | 64 | 3 | 3 | 34 | 49 | 71 |
| Skövde | 44 | 37 | 62 | 49 | 54 | 38 | 46 | 68 | 42 | 7 | 71 |
| Eskilstuna | 56 | 47 | 47 | 47 | 64 | 63 | 29 | 32 | 38 | 26 | 70 |
| Kristianstad | 40 | 35 | 40 | 55 | 50 | 41 | 21 | 61 | 35 | 45 | 69 |
| Ängelholm | 61 | 55 | 20 | 57 | 12 | 34 | 41 | 21 | 48 | 58 | 68 |
| Kalmar/Nybro | 43 | 44 | 46 | 56 | 29 | 23 | 40 | 41 | 52 | 35 | 68 |
| Visby | 34 | 62 | 24 | 50 | 7 | 5 | 17 | 36 | 66 | 68 | 67 |

*Openness 1 and Openness 2 each counts $\frac{1}{4}$ and Integration Index counts $\frac{1}{2}$, which adds up to a total weight of 1 on the Openness variables.

7. People Climate and Location of the Creative Class

According to Florida's (2002) work on US economic development, the creative class is important for generating growth. In theory indicators of people climate – proxies of tolerance and quality of place – have a significant influence on the locational patterns of the creative class. In figure 7.1 the relationship between the creative class and a set of variables is exposed in a schematic form.

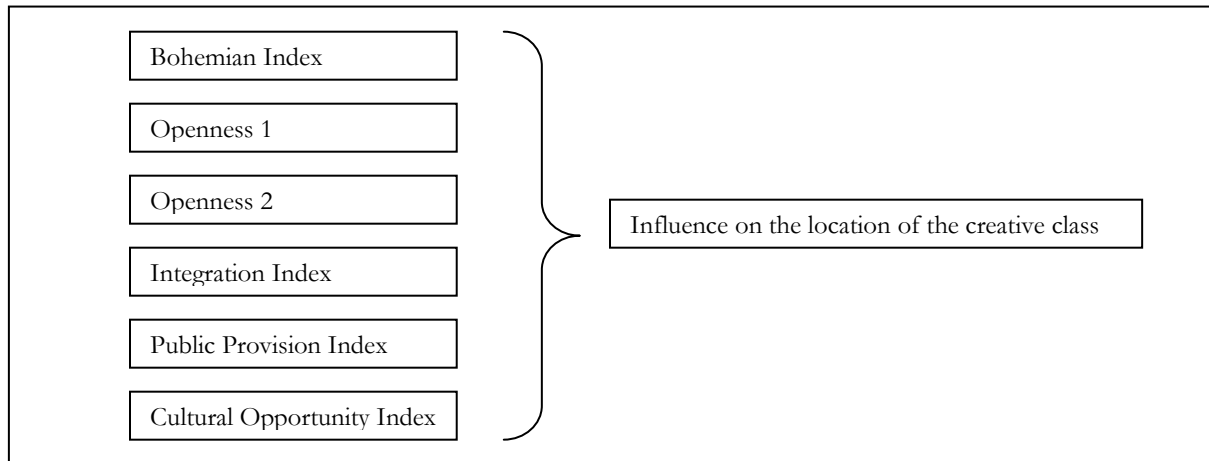


Figure 7.1: Model 1 - The relation between location of the creative class and tolerance, Public Provision and Cultural Opportunity

If this model is correct, the locational patterns of the creative class are dependent on tolerance and quality of place. In chapter 4, the geography of the tolerance indicators was touched upon. It showed that primarily the largest urban areas had a high share of people working in bohemian occupations, and primarily the large cities had high shares of foreign born population - Openness 1 and Openness 2 Indexes. In contrast, the scores of the large cities in the Integration Index, which indicates the differences in occupation rates between foreign born and Swedish born people, were almost disproportional with the findings in the first two Openness Indexes.

Additionally, proxies for quality of place were investigated in chapter 4. While regional differences were relatively small in relation to the PPI, differences were considerable in regard to the COI which showed dense concentration in a small number of regions.

Table 7.1: Correlations between the creative class and indicators of people climate

| | Creative Class (%) | Creative Core (%) | Creative Professionals (%) |
|-------------|--------------------|-------------------|----------------------------|
| Bohemial000 | .803(**) | .659(**) | .819(**) |
| Openness 1 | .768(**) | .681(**) | .740(**) |
| Openness 2 | .420(**) | .313(**) | .456(**) |
| Integration | -.132 | -.200 | -.057 |
| PPI | .130 | .333(**) | -.058 |
| COI | .493(**) | .448(**) | .466(**) |

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 7.1 shows that the Bohemian as well as the Openness1 and Openness 2 Indexes have significant correlations – the Integration Index does, however, not correlate. Moreover, the table shows that a stronger correlation can be found between the three first variables and the creative professionals and the creative core, respectively, than between the same variables and the creative class in total.

Correlations between the creative core and PPI and COI are all significant whereas only correlations between the creative professionals and the creative class and COI are significant. Differences between the creative core and the creative professionals as groups are only possible to analyse with respect to the COI as the PPI does not provide significant answers. Again, however, differences between the two groups are small. Insignificance in the correlations between PPI and the creative class data can be caused by the little variance in the very evenly distributed index.

The correlations illustrate positive relations between high concentrations of creative class people and indicators of quality of place except from the insignificant integration variable. One by one the remaining variables tell a story of mutual positive relationships. Unfortunately, the variable used as proxies for people climate contains a considerable multicollinearity. Therefore it is not possible to make a multiple regression model by use of all 6 variables. Instead the model below is introduced; here only 3 of the 6 variables are included.

Obviously, the use of only 3 out of 6 variables elicit a more imprecise interpretation of the linkages between people climate, as measured here, and the location of the creative class. On the other hand, the exclusion of three variables allows us to make a statistical model and analysis of the linkage between some of the variables that reach beyond shares, LQ's and simple correlations.

To obtain the best match between variables, significance and multicollinearity, we ended up with the model below.

Table 7.2: Model 1 – creative class by variables of people climate*Bivariate correlations of the independent variables*

| | Bohemia1000 | Openness 1 | PPI |
|-------------|-------------|------------|-------|
| Bohemia1000 | 1 | .701(**) | .028 |
| Openness 1 | .701(**) | 1 | -.046 |
| PPI | .028 | -.046 | 1 |

** Correlation is significant at the 0.01 level (2-tailed).

Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|---------|----------|-------------------|----------------------------|
| 1 | .864(a) | .746 | .735 | 2.58936 |

a Predictors: (Constant), PPI, Bohemia1000, Openness 1

ANOVA(b)

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|----|-------------|--------|---------|
| 1 | Regression | 1300.154 | 3 | 433.385 | 64.638 | .000(a) |
| | Residual | 442.515 | 66 | 6.705 | | |
| | Total | 1742.669 | 69 | | | |

a Predictors: (Constant), PPI, Bohemia1000, Openness1

b Dependent Variable: Creative Class (%)

Coefficients(a)

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | Collinearity Statistics | |
|-------|-------------|-----------------------------|------------|---------------------------|-------|------|-------------------------|-------|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | 14.324 | 2.887 | | 4.961 | .000 | | |
| | Bohemia1000 | .838 | .145 | .505 | 5.785 | .000 | .505 | 1.979 |
| | Openness1 | 1.410 | .293 | .421 | 4.816 | .000 | .505 | 1.982 |
| | PPI | 48.166 | 22.139 | .136 | 2.176 | .033 | .991 | 1.009 |

a Dependent Variable: Creative Class (%)

The overall result of model 1 is that it is significant, and R^2 shows that the model explains 74.6% of the variation. Collinearity statistics reveal some multicollinearity with respect to the Bohemian per 1000 inhabitants and the Openness 1 variables. Though multicollinearity is present, it is not alarming, and, hence, the model is acceptable.

In addition, the bivariate correlation shows a relatively high correlation between Bohemia 1000 and Openness 1 (0.701). However, the variables used in the model altogether result in the best fit. Hence, the variables are included in the model even though the relatively high correlation may result in insecurity when interpreting the result.

Unfortunately, the Openness 2 and 3 and COI variables cannot be included in the model, as their presence causes either high multicollinearity or insignificance. Therefore,

valuable knowledge is omitted, but the data leaves us no immediate alternative. The model includes two different proxies for tolerance and one proxy for quality of place. Accordingly, both elements constituting a people climate indicator are present.

Put into an equation, the relationship between this narrow conception of people climate and the location of the creative class in Sweden will be:

$$Y = 14.324 + 0.838 X_1 + 1.410 X_2 + 48.166 X_3$$

Y: the concentration of the creative class; X_1 : Bohemians per 1000 inhabitants; X_2 : share of population with a non-western origin; and X_3 : share of population employed in public services.

To what degree then does people climate influence on the location of the creative class? Restrictions based on multicollinearity and lack of significance have resulted in a less nuanced indicator of people climate than we had hoped for. Naturally, this can be explained by the high level of cohesion that the variables represent, and, hence, also a strong implicit link between several of the variables used as proxies for people climate. Taking this into account, we can conclude that a strong relation between the creative class and some of the indicators of people climate can be identified. According to model 1, the largest impact is caused by Bohemians, and secondly by Openness measured as foreign born non-Westerns. Data does not, however, allow us to evaluate on the impact that the remaining three variables have – whether they are more or less influential than the three variables in the model.

One assumption that could easily come into mind is whether the result is driven by urbanisation in itself. To meet the problem of differences in size, we constructed variables of relative values. To ascertain that population density or large populations do not interfere with the result, we tested for the impact that such two variables will have on the model. Adding population density to the model caused insignificance for the variable itself and PPI while Bohemia 1000 and Openness 1 retained its explaining effect. When adding the population variable, the variable becomes significant, but changes from correlating positively with the creative class to having a negative influence in the model. Further, the PPI comes out insignificant and Bohemia 1000 and Openness 1 retained their value of explanation. This strongly indicates that size of population and urbanisation density cannot explain why people climate parameters tend to co-locate with the creative class.

Having concluded that the variables and the location and concentration of a creative class are somehow closely interrelated, it is important to stress that the model does not exclude

that other factors may be of equal importance or of more importance. Additionally, the model does not provide any final answer as to whether changes in the people climate result in changes in the location of the creative class. Historical data on occupation is unfortunately lacking in Sweden. Solid trustworthy data cannot be tracked further back than 2002. Occupational data is the bedrock of the Creative Class Index, the Bohemian Index and the Integration Index. Talent can be applied as a good proxy for the creative class in Sweden. The correlation between the two variables is very high (0.935), and, hence, the two variables can be expected to behave similarly (see table 7.3 and figure 7.2).

Table 7.3: Correlations between creative class and talent

| | Creative Class (%) | Talent (2002) |
|--------------------|--------------------|---------------|
| Creative Class (%) | 1 | .935(**) |
| Talent_2002 | .935(**) | 1 |

** Correlation is significant at the 0.01 level (2-tailed).

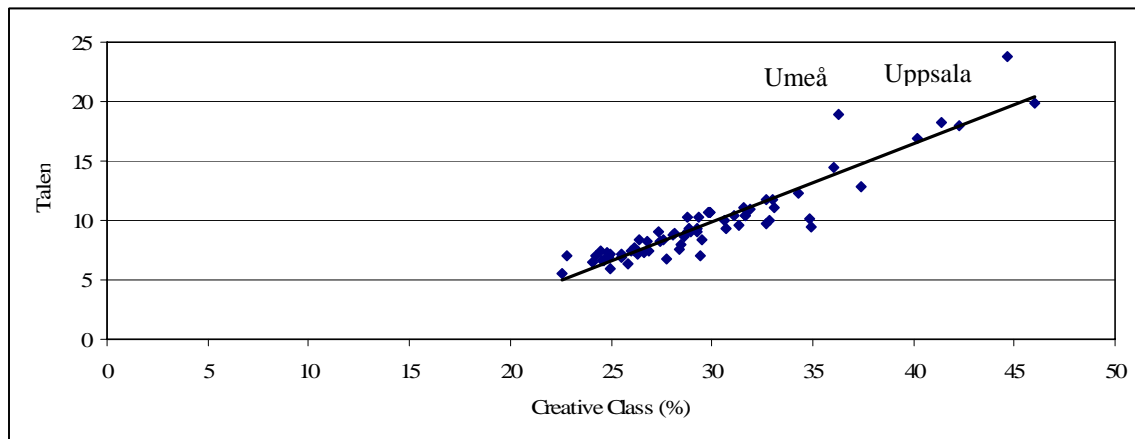


Figure 7.2: The relationship between creative class and talent

The high correlation is a result of the high share of talents that are included in the Creative Class Index. Using changes in talent as a proxy for changes in the concentration of the creative class provides a possibility to study the relationship between the creative class and people climate in a historical perspective. However, the lack of historical occupational data causes another problem – changes in the Bohemian Index and in the Integration Index are impossible to generate and no meaningful proxies can substitute the two indexes. Alongside, lack of significance in relation to changes in the Cultural Opportunity Index and too high correlations between changes in Openness 1 and Openness 2 Indexes leave only two independent variables to include in a model based on changes in a ten- year period from 1993-2002. Hence, the model below should be taken with considerable caution.

Table 7.4: Model 1B – changes in talent by changes in people climate*Bivariate correlations of the independent variables*

| | Changes Openness 1 (1993-2002) | Change PPI |
|--------------------------------|-----------------------------------|------------|
| Changes Openness 1 (1993-2002) | 1 | .560(**) |
| Change PPI | .560(**) | 1 |

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|---------|----------|-------------------|----------------------------|
| 1 | .727(a) | .528 | .514 | 9.68770 |

a Predictors: (Constant), Change PPI, Changes Openness 1 (1993-2002)

ANOVA(b)

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|----|-------------|--------|---------|
| 1B | Regression | 7045.606 | 2 | 3522.803 | 37.536 | .000(a) |
| | Residual | 6288.048 | 67 | 93.851 | | |
| | Total | 13333.654 | 69 | | | |

a Predictors: (Constant), Change PPI, Changes Openness 1 (1993-2002)

b Dependent Variable: Talent change (1993-2002)

Coefficients(a)

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|-------|--------------------------------|-----------------------------|------------|---------------------------|--------|------|-------------------------|-------|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1B | (Constant) | 51.067 | 1.770 | | 28.853 | .000 | | |
| | Changes Openness 1 (1993-2002) | .479 | .096 | .503 | 4.971 | .000 | .686 | 1.457 |
| | Change PPI | .666 | .215 | .313 | 3.096 | .003 | .686 | 1.457 |

a Dependent Variable: Talent change (1993-2002)

Model 1B in table 7.4 shows the best possible fit between low multicollinearity, low bivariate correlations and significance. Put together, it results in a model with an R^2 of 0.528 which is fairly good; it shows the relationship between changes in the regional concentration of talent, one proxy for changes in tolerance and one proxy for changes in the quality of place. Put into an equation the result will be:

$$Y = 51.067 + 0.479 X_1 + 0.66 X_2, X_1: \text{changes in Openness 1}; X_2: \text{change in PPI}$$

Obviously, the model only has a moderate value in explaining the desired relationship between changes in concentration of the creative class and changes in people climate, due to the exclusion of several of the presented indicators. Taking that into account, the model shows a positive link between changes in the people climate variables and an

agglomeration of creative class people based on data covering a ten-year period from 1993-2002. Once again it is important to stress that the analysis does not exclude that other factors may be of influence. Especially in this model, it is important to underline that the model only includes two proxies for people climate.

However, having stated a positive relationship between the creative class and people climate, the next chapter will look into the changing geography of the creative class and how this is linked to changes in the business climate and further to regional growth.

8. The Creative Class, Business Climate and Regional Growth

Having investigated the conditions that have an impact on the localisation of the creative class, we now move on to an investigation of the relation between regional development and the presence of a creative class. Regional growth will be measured as employment per inhabitants. The creative class is believed to have significant impact on regional economic performance. However, its importance is believed to be primarily indirect through its impact on high-tech employment, innovation and entrepreneurship. A model (model 2) illustrating this relationship can be seen in figure 8.1a

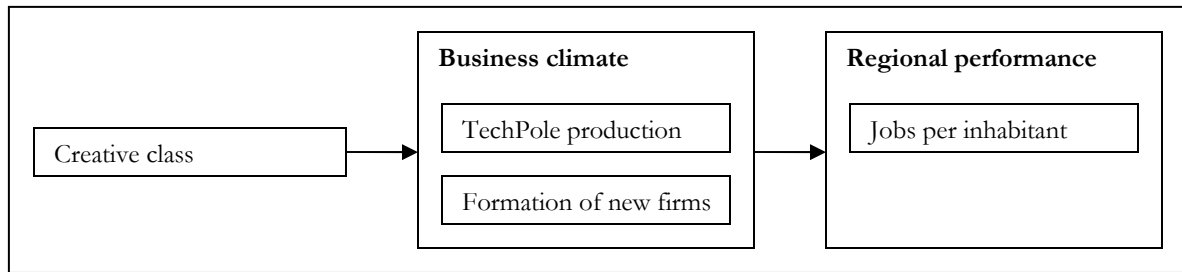


Figure 8.1a: Model 2 - The theoretical relation between location of the creative class, business climate and regional growth

The analysis of the relationship starts by identifying the relation between the location of the creative class and TechPole production on the one hand, and formation of firms on the other. This relationship can be demonstrated by two linear regressions.

The first regression concerns Tech Pole (Y_1) by the creative class (X_1); the second regression concerns firm formation per 1000 inhabitants (Y_2) by creative class (X_1).

$$Y_1 = 0.7546 X_1 - 20.597, R^2 = 0.3461; P = 8.52 \cdot 10^{-8}$$

$$Y_2 = 0.0511 X_1 + 4.702, R^2 = 0.0654; P = 0.0325$$

The two single regressions are both significant. The R^2 value of Y_1 reveals an acceptable level whereas R^2 for Y_2 is so low that the equation is of very little use. Compared to the former equations – which express the relationship between people climate and the creative class, chapter 7 – it is fair to conclude that the relationship between indicators of people climate and the creative class are more evident than the relationship between creative class and business climate. One reason can be found in an actual strong relation between people climate and creative class people; another reason can be imprecise proxies for business climate. It might also be a combination of the two. While the modified Tech Pole Index that we use in this report matches the intuition of economic

activities in Sweden, the Firm Formation Index is a poorer proxy based on the problems pointed to in chapter 5 – that activities within agriculture and within the services sector provide a more blurred picture in regard to economic activities that spin off jobs.

Moving further, the relation between the two indicators of business climate and the indicator of regional growth or performance shall be analysed and put into a multiple regression model.

Tabel 8.1: Model 2: Business climate and regional performance

Correlations

| | Tech Pole 2002 | Firm Formation per 1000 inhabitants | Jobs_per_inhabitants _18_64 |
|-------------------------------------|-------------------|--|--------------------------------|
| Tech Pole 2002 | 1 | .354(**) | .262(*) |
| Firm Formation per 1000 inhabitants | .354(**) | 1 | -.327(**) |
| Jobs_per_inhabitants_18_64 | .262(*) | -.327(**) | 1 |

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|---------|----------|----------------------|-------------------------------|
| 2 | .520(a) | .271 | .249 | 4.93843 |

a Predictors: (Constant), Firm Formation per 1000 inhabitants, Tech Pole 2002

ANOVA(b)

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|-------|------------|-------------------|----|-------------|--------|---------|
| 2 | Regression | 605.899 | 2 | 302.950 | 12.422 | .000(a) |
| | Residual | 1634.000 | 67 | 24.388 | | |
| | Total | 2239.899 | 69 | | | |

a Predictors: (Constant), Firm Formation per 1000 inhabitants, Tech Pole 2002

b Dependent Variable: Jobs_per_inhabitants_18_64

Coefficients(a)

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|-------|--|--------------------------------|------------|------------------------------|--------|------|----------------------------|-------|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 2 | (Constant) | 84.469 | 3.924 | | 21.525 | .000 | | |
| | Tech Pole 2002 | .382 | .099 | .432 | 3.875 | .000 | .875 | 1.143 |
| | Firm Formation per 1000 inhabitants | -2.726 | .633 | -.480 | -4.304 | .000 | .875 | 1.143 |

a Dependent Variable: Jobs_per_inhabitants_18_64

Model 2 in table 8.1 expresses the relationship between business indicators and regional growth or performance measured as jobs per inhabitant between 18 and 64 years, all for 2002. Mutual correlations between the independent variables as well as multicollinearity are not an issue in this model. While problems of multicollinearity are not an issue in model 2, the R^2 value is low, and, hence the value of model 2 is limited to explain only

27% of the variation in data. However, put into an equation, the relationship will be as follows:

$$Y = 0.382 X_1 - 2.726 X_2 + 84.469, X_1: \text{tech pole}; X_2: \text{firm formation}$$

The most notable indication above is the negative and significant correlation between the firm formation per 1000 inhabitants variable and the job per inhabitant variable. This relationship also results in a negative β coefficient in the equation. A few comments have to be attached to this result. Firstly, all new firms are included in the data, regardless of them being inactive or not. Turnovers, employment etc. are not criteria for this register, and, hence, it does not really imply anything about a region's future potential. Secondly, entrepreneurial activities in terms of start-ups of firms tend to be linked to tradition. Some places have traditions of many small firms, other of fewer but larger firms. Differences in this type of tradition will have a serious effect in this type of data. Thirdly, and related to the latter, regions with many large firms will have a low number of start-ups while regions with few large firms will have a relatively higher number of start-ups. Finally, the variable does not regulate for shutdowns. Consequently, the firm formation per 1000 inhabitants can be misleading or incorrect as an indicator of business climate. Why is it included then? As mentioned initially in this report, this work is based on a European research project counting 8 countries, and compromises have been one of the tasks for this project. Hence, some of the indicators are inappropriate or imprecise in some contexts while adequate in others.

Like Model 1, Model 2 only explains the relation between the variables at a certain time – in this case 2002. It does not express the relationship in time. To create a model that expresses the relationship in time and hence points to the effect that a growing creative class has on the development of business climate variables and further on indicators of regional growth, we need to analyse the changes that the parameters undergo within a certain period. As mentioned in the former chapter, historical data on the creative class is not accessible in Sweden. Hence, the creative class will be substituted by the development in talent in a ten-year period from 1993-2002. Further, the TechPole Index is constructed in a way that makes calculations of changes within a certain period meaningless. Instead the changes in employment within the high-tech industries from 1993-2002 will be used as a proxy for development in business climate. Firm formation will be calculated based on the changes from 2000-2002 as these years are the only available in our database. Alongside looking at changes over time, this allows us to come up with two proxies on regional growth or performance. The one is the changes in population and the other is changes in employment or job growth.

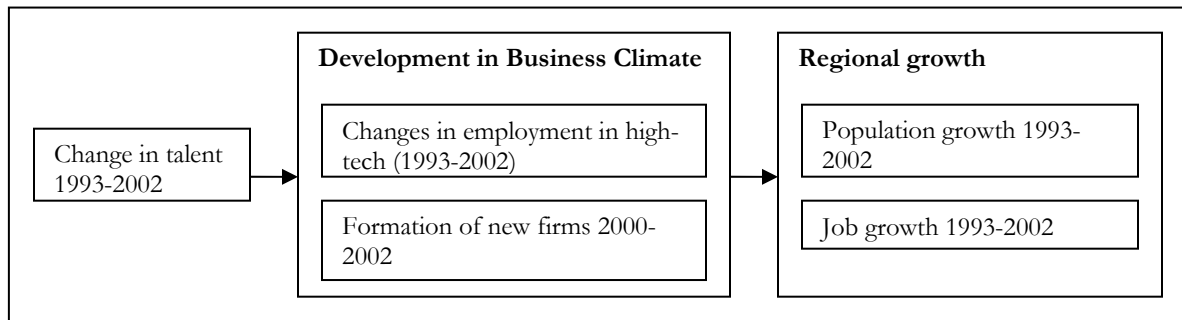


Figure 8.2: Model 2B the theoretical relation between the creative development in talent (as proxy for creative class) and business climate and further its impact on regional growth

In figure 8.2 the theoretical relationship between the variables is pictured. Two single equations can be expressed based on the part of the model. Regression between change in talent (X_1), change in employment in high-tech industries (Y_1), changes in talent (X_1) and changes in firm formation (Y_2) result in the two following equations:

$$Y_1 = 0.0835 X_1 + 54.815, R^2 = 0.0521; P = 0.0573$$

$$Y_2 = -0.4568 X_1 + 55.814, R^2 = 0.0651; P = 0.0329$$

As the former relationships, the relationship between change in talent and firm formation displays a negative relationship. Two comments have to be attached to this relationship. First of all, firm formation data only covers a three- year period whereas the talent variable covers ten years. Secondly, the firm formation variable includes all industries; consequently, small positive changes in e.g. agriculture in a remote region can cause the region to score high on changes in the period.

The equations both have acceptable significance levels, but likewise they both have very low R^2 values, which results in a limited value of explanation. Consequently we cannot show a positive link an increasing creative class and an improved business climate. The lack of a statistical relation can find at least two possible explanations; the variables used as indicators of business climate are imprecise, or the relationship talent and an improved business climate might not be as straightforward as Florida suggests. Due to the limited value of explanation that the models provide, we can expect that other variables not listed here also play an important role for changes in business climate.

The next step in Model 2B is to study the relation between the two indicators of business climate and regional growth. As two indicators of regional growth are provided, we end up with two multiple regression models. The first plots the relationship between business climate and population growth.

Table 8.2: Model 2B regional growth by changes in business climate*Bivariate correlations of dependent and independent variables*

| | Change in High tech Employment (1993- 2002) % | Change in new firm formation (2000-2002) | Job growth total (1993-2002) (%) | Population growth |
|---|---|--|-------------------------------------|----------------------|
| Change in High Tech Employment (1993- 2002) % | 1 | .004 | .232 | .325(**) |
| Change in new firm formation (2000-2002) | .004 | 1 | -.334(**) | -.312(**) |
| Job growth total (1993- 2002) (%) | .232 | -.334(**) | 1 | .846(**) |
| Population growth | .325(**) | -.312(**) | .846(**) | 1 |

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Growth in population by business climate – Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|---------|----------|----------------------|-------------------------------|
| 2B | .451(a) | .204 | .180 | 4.88380 |

a Predictors: (Constant), Change in new firm formation (2000-2002), Change in High Tech Employment (1993-2002) %

ANOVA(b) – Growth in population by business climate

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|-------|------------|-------------------|----|-------------|-------|---------|
| 2B | Regression | 409.031 | 2 | 204.516 | 8.575 | .000(a) |
| | Residual | 1598.052 | 67 | 23.852 | | |
| | Total | 2007.083 | 69 | | | |

a Predictors: (Constant), Change in new firm formation (2000-2002), Change in High Tech Employment (1993-2002) %

b Dependent Variable: Population growth

Coefficients(a) – Growth in population by business climate

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | Collinearity Statistics | |
|-------|--|-----------------------------|------------|---------------------------|--------|------|-------------------------|-------|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 2B | (Constant) | -4.339 | .777 | | -5.587 | .000 | | |
| | Change in High Tech Employment (1993-2002) % | .046 | .015 | .326 | 2.995 | .004 | 1.000 | 1.000 |
| | Change in new firm formation (2000-2002) | -.217 | .076 | -.313 | -2.872 | .005 | 1.000 | 1.000 |

a Dependent Variable: Population growth

Job growth by business climate – Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|---------|----------|-------------------|----------------------------|
| 2B | .408(a) | .166 | .141 | 6.24190 |

a Predictors: (Constant), Change in new firm formation (2000-2002), Change in High Tech Employment (1993-2002) %

ANOVA(b) – Job growth by business climate

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|----|-------------|-------|---------|
| 2B | Regression | 519.801 | 2 | 259.900 | 6.671 | .002(a) |
| | Residual | 2610.409 | 67 | 38.961 | | |
| | Total | 3130.210 | 69 | | | |

a Predictors: (Constant), Change in new firm formation (2000-2002), Change in High Tech Employment (1993-2002) %

b Dependent Variable: Job growth all (1993-2002) (%)

Coefficients(a) – Job growth by business climate

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | Collinearity Statistics | |
|-------|--|-----------------------------|------------|---------------------------|--------|------|-------------------------|-------|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 2B | (Constant) | 2.624 | .993 | | 2.643 | .010 | | |
| | Change in High Tech Employment (1993-2002) % | .041 | .020 | .234 | 2.095 | .040 | 1.000 | 1.000 |
| | Change in new firm formation (2000-2002) | -.290 | .097 | -.335 | -3.000 | .004 | 1.000 | 1.000 |

a Dependent Variable: Job growth all (1993-2002) (%)

Narrowed down to equations, the relation can be expressed as follows:

$$Y_1 = 0.046 X_1 - 0.217 X_2 - 4.339$$

$$Y_2 = 0.041 X_1 - 0.290 X_2 + 2.624$$

Y_1 reflects growth in population, Y_2 reflects job growth, X_1 equals change in high-tech employment, and X_2 equals change in firm formation. The two steps in Model 2B show significance and behave nicely in regard to multicollinearity. The R^2 values of 0.204 and 0.166, respectively, reflect models that only explain a limited part of the data. Moreover, they suggest that population growth is marginally closer linked to development in business climate than job growth is. Based on this result, it is tempting to suggest that parameters that differ from the business climate parameters used in this report might have an important impact on regional growth as well. Again it has to be stressed that the firm formation variable – here representing change - is negative. Explanations for this are the same as in the static model above.

Testing the Direct Effect of Talent

In order to test for the business climate parameter, we also test the direct relation between the creative class and regional performance and talent and regional growth. Here, more statistical valid equations rise. If the static picture is investigated, the relationship between employment per inhabitant and the creative class can be expressed as below:

$$Y = 0.1407 X + 64.03, R^2: 0.015,$$

The R^2 value shows that the value of this expression is rather limited, which is in line with the former finding. However, if we move further on to the dynamic model where the creative class is substituted by talent and two measures of regional growth are present, the two equations below emerge:

$$Y_1 = 0.3499 X_1 - 15.282, R^2: 0.5214, Y_1: \text{population growth}, X_1: \text{change in talent}$$

$$Y_2 = 0.3197 X_1 - 20,606, R^2: 0.6794, Y_2: \text{job growth}, X_1: \text{change in talent}$$

The two models have much more validity in terms of R^2 and, hence, are more interesting in terms of regional planning. Therefore, the presence of creative and talented people might have an effect on regional growth, independent of the state of the region's business climate. This suggests that in a Swedish context the link between growth and Florida's three T's can be narrowed down to two T's; talent and tolerance. Tolerance increases the concentration of talents and talents increase growth.

In the following chapter we will discuss the result of the analysis of the relationship between people climate, the presence of a creative and talented workforce and business climate and how the business climate influences on regional performance.

9. Conclusion

In the above chapters, a description of a quantitative analysis of the geography of the creative class in Sweden has been presented. Additionally, the relationship between geography and different indicators of economic growth and economic potential has been investigated.

We have presented the most central arguments in the emerging critique of the creative class thesis. We have discussed the critique addressed by Glaeser (2005), Markussen (2005) and Peck (2005), and, further, we have presented the critique and the attempt to unpack Florida's creative class thesis by Hansen et. al. (2005) by introducing the knowledge base perspective on the creative class. By pointing to these critiques, we believe that we have touched upon the most obvious attempts to put the creative class thesis into a less consultancy-like perspective. We have argued that a more diverse understanding of the creative class is preferable, though this is not the aim of this report. Adapted indicators of technology, talent and tolerance have been introduced to move the creative class thesis away from an American based set of indicators into a set of indicators better fitted for a European context.

The analysis has been restricted by a lack of quantitative data on the historical development of the creative class. Consequently, the investigation has not been able to point to firm statistical evidence on connections between the increase in creative class and increase in economic growth. To compensate for this, development of the talent variable (equal to human capital) has been introduced as a nearby proxy – based on the 0.935 correlation between creative class and talents (equal to human capital) in 2002. In the light of the ongoing discussion of the similarities and differences between using the creative class and using talent as proxies for human capital, we have used a rather compromising method. This is solely due to lack of historical data on the creative class and a desire from our side to investigate the relation between creative and talented people and people climate, business climate and regional growth. The compromising method which uses the creative class for the static description and talent for the dynamic description has been adaptable due to the high correlation between talent and the creative class. In chapter 3 we provided a statistical description of the creative class in Sweden. An analysis revealed that only 40% of the creative class in Sweden is categorised as people having a university degree equal to or above bachelor level. This finding can easily be pointed at as a conflicting parameter later on when we apply talent as a proxy for the creative class. It is, however, important to stress that talent is a suitable proxy because the correlations between the two are extremely high and because seven times as many talents are included in the creative class category than in the 'non-creative' category.

The findings of this report have provided a picture of a creative class that is well educated, is more ethnical Swedish than the ‘non-creative’ population, and working within many different types of occupation. Further, different measures of regional levels of technology, talent and tolerance have been addressed. The analysis has shown that with few exceptions major university cities have proven best in the Florida inspired ranking.

Besides the indexes used by Florida and his colleagues, we have added indexes of Integration, Public Provision, Cultural Opportunity, and New Firm Formation. This has been done to test for the effect that quality of place and entrepreneurship can have on regional development aside from the well-known technology, talent and tolerance indexes. By adding the new indexes to the ones developed in an American context, we have pointed to variables that are more adequate if the creative class thesis is to be put into a European context. Especially the PPI index is a factor that, among many, is said to be important for the international competition within Europe.

Concluding on the results, the most important findings of this report are as follows: When measuring the location of the creative class, technology, talent and tolerance, Uppsala, Stockholm, Gothenburg and Malmö appear as the most competitive Swedish regions. Though historical data on the creative class is absent, it seems that a clear connection can be identified between places that attract talent and creative class people and places that experience regional growth, without taking business climate into account. Surprisingly, Uppsala comes out better than Stockholm, but the answer can be reduced to a single variable – Uppsala performs better on the PPI, partly due to the dominance of university activities, partly due to the economies of scale in the public sector; the larger a region is, the more difficulties it will have in performing well on the PPI variable.

Overall Uppsala, followed by Stockholm, Malmö and Gothenburg, is significantly more competitive than the rest of the Swedish regions with respect to the indicators applied here. Many of the medium sized Swedish labour market regions perform well in some indexes but have rather limited success in others. The four large and leading regions perform well in all the indexes, except from the Integration Index in which only Stockholm performs well.

Looking at the indexes one by one, it seems that Stockholm has a more dominating nature than the impression provided by the sum of the total ranking. Stockholm is very dominating in the Tech Pole and the Cultural Opportunity Indexes and comes out with better scores than Uppsala in all Indexes but PPI and Talent. Obviously, this implies that the adding-up of performance in the indexes can be misleading. However, though the

adding-up performance list can be argued to be slightly misleading in the case of Stockholm and Uppsala, the list is generally trustworthy with respect to the indication of the overall creative level between the Swedish labour market regions.

Moving from the top of the list to the bottom, Helsingborg/Landskrona are noticeable by surprisingly only qualifying as number 19 out of the 25 largest regions. Helsingborg/Landskrona have problems in many of the indexes but actually stand out with indications of being a fairly tolerant region. High scores in the Bohemian as well as the Openness 1 and Openness 2 indexes are, however, contrasted by a low score on the Integration Index which results in an overall less favourable tolerance score. Helsingborg/Landskrona suffers from structural difficulties in regard to industries. Naturally, this has implications for the labour force. Accordingly, combining these two factors place Helsingborg/Landskrona in a position where the region has to face the challenges of redeveloping itself into a competitive knowledge based region by supporting the sectors that fit the present labour market.

To broaden the perspective, the study has presented comparable findings from Denmark, Finland and Norway – though these have not been analysed to the same extent. What these data show is roughly the same as the Swedish study shows – the overall creativity index (creative people, talents, people climate and business climate) favours large urbanised regions (Andersen et.al., 2007).

To address the statistical impact the variables have on each other, models have been presented. The first model – Model 1 and Model 1B – proved a strong positive connection between people climate and the creative class (and increase in talent). Unfortunately, multicollinearity forced us to only include some of the variables that have been presented as proxies for people climate. However, we believe that the variables that could be included in the models reflect crucial elements of the people climate.

The next step has been to model the extent to which the presence of a creative class can be linked to business climate and next to regional growth or regional performance. Here, we have fitted two models as well – Model 2 and Model 2B. The models have shown little multicollinearity on the one hand, and low R^2 values on the other. Especially the R^2 in the dynamic model (2B) is low. This raises some uncertainty in regard to the relationship between talent, business climate and regional growth. If a direct linkage between a positive increase change in talent and regional growth is present, a stronger regression appears. This leads us to believe that the creative class over time has a positive impact on regional development, but that the business climate part of Florida's theoretical model does not prove very important in a Swedish context. The most obvious explanation for this lack of statistical cohesion is very likely that the proxies used within this analysis

are imprecise or far more complex than suggested by Florida. Hence, a re-examination of the relationship between the creative class, business climate and regional performance and growth is desirable to introduce new and better measures of business climate. Secondly, the theoretical importance that Florida's theoretical approach assigns to business climate might be exaggerated. The knowledge based economy might be far less dependent on traditional business climate parameters. As competitiveness increasingly depends on labour as carriers of knowledge, business climate might have lost its importance in contemporary regional development. Further, the analysis lead us to state that the 3T model, arguing that growth is an outcome of co-presence of technology, talent and tolerance, is not the case in Sweden. Growth is rather linked to tolerance and talent. Thus in Sweden, the three T's are narrowed down to two – based on the variables used in this analysis.

Consequently, we can argue that the US tendency to find co-locations between business climate, people climate, creative people as well as talents and regional growth is not a Swedish phenomenon to the same degree; although linkages between the different variables can be detected within the Nordic countries including Sweden. The tendency to find positive correlations between the majorities of the variables within more than one country makes the creative class approach a stronger argument, but the Swedish case raises an important question of the impact of business climate. It is fair to conclude that the creative class has some positive impact on regional growth but that the line of argument that Florida presents is more complicated and complex than Florida states. Therefore future research should focus on the impact that differences exist between varieties of capitalism in Europe and USA.

This is in line with the finding of Mellander & Florida (2006), who with a creative class inspired research on the parameters for regional development, investigate some linkages between universities, tolerance, the creative class and regional growth in Sweden. The study by Mellander & Florida uses other proxies than we do. Furthermore, the models that they come up with are static as they only use data for 2003, and, hence, do not address the time perspective. Subsequently, the comparison is not straightforward. The two studies do, however, end up with the same tendencies; in spite of the differences, parameters on tolerance and quality of place tend to co-locate with the creative class and the creative class tend to be located in areas where parameters of regional performance are high.

But what implications do the findings of this report have on regional development in Sweden? Sweden as well as the other Nordic countries has a long tradition of equalizing regional development by allocation of economic resources and government investments. For a long time this has secured a more equal development nationwide than in other

European countries and North America. The transition towards a knowledge based economy has to some extent been favouring the “Nordic model” because the general high educational level has been a contributing factor in rating the Nordic countries high in the many lists of the most competitive economies in the world.

Sweden is, however, on a crossroad – should regional development focus on equalizing regional differences or should effort be put into developing the regions that have the necessary conditions favourable to the new economy? Both can of course be the pragmatic answer. Less favoured and peripheral regions still need nursing and supply of economic resources, but the allocation of goods and services may need to change focus. Effort should be put into education, re-education and competence building of the workforce to make them fit the actual industrial structure of the region on the one hand. On the other hand, however, it may prove successful to be able to up-grade the level of knowledge within the applied knowledge base in the region. This can be understood as a two-folded way to develop regions by using the embedded knowledge within the region, and, simultaneously, by up-grading the knowledge level within the actual knowledge level and thereby prepare the workforce for the coming of an increasingly knowledge intensive and innovation dependent economy.

Alongside regions with a competitive advantage with regard to creative milieus, achieving good people and business climates require encouragement and help to continually renew and improve the conditions that have an impact on the ever changing people climate and business climate indicators. Growth in large and urbanised regions will have a trickle down effect on nearby regions. This has been documented by Lundquist et. al. (2006) who have shown that the developments in Stockholm can be identified in most other urbanised regions with approximately 10 years’ delay. The findings of Lundquist et.al. point to a central element in future development – that the development of large regions can bring development to other regions. Hence, one can conclude that regional development must be a combination of distribution of economic resources from favoured to less favoured regions. But simultaneously supporting factors that have an impact on business and people climate in the successful regions have to be present in order to keep up the cadence of growth.

Summarising, the learning of this report is that a link between the creative class, people climate and regional growth tends to be present in Sweden. The statistical impact of business climate is almost absent. This indicates that if people climate is supported, many of the large urbanised regions in Sweden will tend to have good conditions in an ever globalising economy. This will, however, ask for conditions that allow the large urbanised regions to grow, not at the expense of the less favoured regions, but in combination with the less urbanised regions. The analysis of the report also indicates that

education and/or creative and innovative mindsets tend to have an impact on regional growth. Therefore, to maintain a good educational system as well as a welfare system that gives the opportunity of free education may turn out to be extremely important for the future competitiveness of Sweden.

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Appendix 1

The categorisation of the creative class is listed below. Data is based on SSYK data from Statistics Sweden and is a Swedish interpretation of the international ISCO 88 nomenclature.

Data is based on place of residence and only counts the working population from 18 to 65 years.

Table 1: Creative class (SSYK)

| Creative Core | |
|----------------------|---|
| <i>SSYK</i> | <i>Text</i> |
| 211 | Physicists, chemists and related professionals |
| 212 | Mathematicians and statisticians |
| 213 | Computing professionals |
| 214 | Architects, engineers and related professionals |
| 221 | Life science professionals |
| 222 | Health professionals (except nursing) |
| 231 | College, university and higher education teaching professionals |
| 232 | Secondary education teaching professionals |
| 233 | Primary education teaching professionals |
| 234 | Special education teaching professionals |
| 235 | Other teaching professionals |
| 243 | Archivists, librarians and related information professionals |
| 244 | Social science and linguistics professionals (except social work professionals) |
| 247 | Public service administrative professionals |

| Creative Professionals | |
|-------------------------------|--|
| <i>SSYK</i> | <i>Text</i> |
| 1 | Legislators, senior officials and managers |
| 223 | Nursing and midwifery professionals |
| 241 | Business professionals |
| 242 | Legal professionals |
| 31 | Physical and engineering science associate professionals |
| 32 | Life science and health associate professionals |
| 341 | Finance and sales associate professionals |
| 342 | Business services agents and trade brokers |
| 343 | Administrative associate professionals |
| 345 | Police officers and detectives |
| 346 | Social work associate professionals |

Table 2: High-tech industries

| SNI | Industry |
|-----|--|
| 244 | Manufacture of pharmaceuticals, medicinal chemicals and botanical products |
| 300 | Manufacture of office machinery and computers |
| 321 | Manufacture of electronic valves and tubes and other electronic components |
| 322 | Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy |
| 323 | Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods |
| 331 | Manufacture of medical and surgical equipment and orthopaedic appliances |
| 332 | Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment |
| 333 | Manufacture of industrial process control equipment |
| 334 | Manufacture of optical instruments and photographic equipment |
| 335 | Manufacture of watches and clocks |
| 341 | Manufacture of motor vehicles |
| 342 | Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers |
| 343 | Manufacture of parts and accessories for motor vehicles and their engines |
| 353 | Manufacture of aircraft and spacecraft |
| 642 | Telecommunications |
| 721 | Hardware consultancy |
| 722 | Software consultancy and supply |
| 723 | Data processing |
| 724 | Data base activities |
| 725 | Maintenance and repair of office, accounting and computing machinery |
| 726 | Other computer related activities |
| 731 | Research and experimental development on natural sciences and engineering |
| 732 | Research and experimental development on social sciences and humanities |
| 742 | Architectural and engineering activities and related technical consultancy |
| 743 | Technical testing and analysis |
| 921 | Motion picture and video activities |

Table 3: Bohemian occupation

| Bohemian occupation | |
|---------------------|--|
| SSYK | Text |
| 245 | Writers and creative or performing artists |
| 347 | Artistic, entertainment and sports associate professionals |
| 521 | Fashion and other models |

Table 4: Western/Non-Western population

| Area | Categorisation |
|--|----------------|
| Africa | Non-Western |
| Asia | Non-Western |
| EU25 without Denmark and Finland | Western |
| Europe without EU25 and the Nordic countries | Western |
| Nordic Countries without Sweden | Western |
| North America (incl. Mexico) | Western |
| Oceania | Western |
| Unknown | - |
| South America | Non-Western |
| Soviet Union (incl. the former USSR republics) | Western |
| Stateless | - |
| Sweden | Western |

Table 5: PPI

| SNI | Industry |
|-----|---------------------------|
| 801 | Primary education |
| 802 | Secondary education |
| 803 | Higher education |
| 804 | Adult and other education |
| 851 | Human health activities |
| 852 | Veterinary activities |
| 853 | Social work activities |

Table 6: COI

| SNI | Industry |
|-----|--|
| 553 | Restaurants |
| 554 | Bars |
| 921 | Motion picture and video activities |
| 922 | Radio and television activities |
| 923 | Other entertainment activities |
| 925 | Library, archives, museums and other cultural activities |
| 926 | Sporting activities |

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