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1 Introduction

The purpose of this thesis is to study the location of cultural workers in Sweden and investigate the economic factors behind that distribution. This study contributes to previous research by investigating the economic geography of culture at the municipality level in Sweden.

Sweden is an interesting sample because of the “creative class”, which Florida (2002) argued to be the main source of innovation and cultural dynamism in today’s urban society, managed to outperform educational measures for regional per capita wage in Sweden (Mellander and Florida, 2009). Furthermore, Sweden did in 2011 have the highest urbanization rate in EU (Magnusson, 2012), resulting in only 40 out of 290 municipalities having more youths moving in than moving out (Mellander, 2013). By understanding and improve one’s knowledge of how to attract creativity and culture, there might be possibilities for many of the Swedish municipalities to change their declining pattern.

Sweden also has a cultural scene that is flourishing. In particular the Swedish music industry, which has a history of exporting music recognized worldwide and is still upholding that reputation with musicians and songwriters topping the charts around the globe. Avicii, Robyn, Lykke Li and Swedish House Mafia have all experienced great success outside the country’s borders during the last decade. Madonna, Taylor Swift, Lady Gaga, and Katy Perry are just a few of many successful artists with Swedish songwriters boosting their careers. Spotify and Soundcloud helped developing the music industry’s new digital framework. Sweden has become the number one exporter of music relative to GDP (Ferreira and Waldfogel, 2013).

The Swedish music industry is a good example of how a country can specialize in a certain field. The underlining reasons behind such developments are something that economic geographers have been aiming to understand for ages. How come that some industries are more innovative, more vibrant and more successful in some regions and less in others? Does the local environment have an impact on an industry’s potential to grow and develop?

Approaching these questions from a creative and cultural perspective has appeared more frequently in recent years. According to Florida (2002) professionals do not move to where the jobs are anymore. They more often choose location first, and search for jobs second. He claims that people and creative people in particular, look for places where they can find an overall meaning, places which allow them to be creative within the community. Creative professionals are also expected to be more flexible and change location in regard to where they can find meaning in life (Landry, 2006).

However, the increased globalization has caused researchers to start questioning the importance of location. Cairncross (1997) stated that we are facing the death of distance and Friedman (2005) that “the world is flat”. Working with people on the other side of the planet might not be seen as an obstacle in today’s technologically advanced society.

Research does nonetheless show that geographical concentration of industries is increasing rather than decreasing (Leamer and Storper, 2001; Wichmann Matthiessen et al., 2010). Even though a global economy creates a more accessible market through enabling better and faster ways of transportation and communication, competitive advantages tend to be very local. According to Porter (1998), that is a result of all the highly specialized set of skills, knowledge, rivals, related business and customers developing when industries con-

concentrate in certain regions. He claims the globalization to add to this development instead of diminishing its importance. Furthermore, Hendersson (1995) argue that specialization patterns of the past affect the specialization patterns in the future, where regions who are able to gain a competitive advantage within a certain field, in most cases keep its advantages.

Most firms still choose to locate near the biggest markets because their long-term competitiveness is today determined by their capacity to innovate and ability to learn (Malmberg and Maskell, 2002). Experience-based knowledge is created and reproduced through different forms of social interactions and is easier to obtain by working close to someone who “knows” (Granovetter, 1985; Gertler, 2003). The importance of this experience-based knowledge is continuously increasing. Landry and Bianchini (1995) stated the 21st century-industries tend to be increasingly dependent upon knowledge, which will work as a production resource similar to what material and technology have been during the 19th and 20th centuries.

However, clusters of creative knowledge-based industries are not a new phenomenon. Culture and creative people have a long history of concentrating to certain regions such as, the classical period of ancient Athens and Rome or the renaissance in Florence. More current examples could be the fashion industry in Paris or movie business in Hollywood.

Creative clusters are a result of a constant dependency on localized consumption (Andersson and Andersson, 2006). Art galleries, theaters, concerts and other live events are activities that require a higher customer demand as distance increases. Bigger cities are therefore more likely to have an overrepresentation of culture as a result of economic agglomeration (Scott, 2009). Economies of scale and economies of scope are easier to exploit in bigger regions. Andersson and Andersson (2006) found that cultural workers can reduce the impact of high fixed costs in regions with a higher aggregate demand. They take the example of high fixed costs of venues as one of the possible reasons for scale economies, while the sharing of the venues high fixed costs with other activities indicates positive effects of scope economies.

This paper argues economies of scale to be a stronger factor attracting cultural workers, than economies of scope. Furthermore, this paper argues the distance-sensitivity of the cultural industry to lead to concentration of culture and path dependency.

1.1 Delimitations

Available occupational data is only including registered workers. That means that only cultural workers who are cultural worker as their primary occupation are included in the data. For example, a musician who makes a primary living as a waiter or a waitress is registered as a waiter/waitress and not as a musician.

2 Literature Review

The cultural industry is first and foremost a creative industry. Throsby (2001) defines creativity as the production process of cultural goods. One of the most accepted definitions is the one of Negus and Pickering (2004) who said that creativity *“is reaching beyond the point of becoming competent where skills and capacities are raised to a level of practice that attains its own dynamic rhythm and movement”*.

Because culture and creativity often go hand in hand, this thesis will not draw a definite line between them. Therefore, the following section is a review of previous research and theories in the economic geography of cultural and creative industries. It begins by briefly going through the main theories of economic geography as a whole, to later apply the theories to the culture and creativity. The section ends with listing the hypothesis of the study.

2.1 Agglomeration Economies

Agglomeration economies are usually divided into “location economies” and “urbanization economies”. Generally put, the agglomeration economies has its roots in Marshall’s (1890) industrial districts, while the urbanization economy in Jacobs (1961) diversity theories. Research on clusters and economic geography has however historically been mostly focused on industrial clusters (Karlsson, 2011). Based on Marshall (1890) who made several observations regarding innovation in industrial districts and how tacit knowledge helps clusters to develop. The transformation from the term industrial districts to the term business cluster did not really happen until Porter (1990). The cluster concept then gained prominence, spread around the world and is still the term that economic geographers today normally use.

Krugman (1991) said that the very existence of clusters proves that there are benefits to be drawn from increasing returns to scale. He meant that the financial gains from buying and selling products to/from a region with a high geographical producer-density encourage producers to locate together. According to Hallencreutz et al. (2004), there are four main benefits possible to exploit in agglomeration economies. The first two create minimized costs through cheaper production (as a result of scale and scope effects) and cheaper transport/transaction costs (through enhanced possibilities to consume/offer tailor made services). The final two are according to Hallencreutz et al. (2004), a geographical concentration of specialized competences and flows of tacit knowledge, which stimulate learning and innovation.

Andersson and Andersson (2006) divided the attractiveness of cultural clusters into pecuniary and non-pecuniary external economies. Pecuniary external economies are more or less facilitated access to everything from cheaper delivery of goods and services, to easier access to publishers/producers. Non-pecuniary externalities refer to factors difficult to measure in financial terms, such as exchange of ideas through interactions with colleagues or other “productivity-enhanced” benefits.

Andersson and Andersson (2006) further found that economies of scale generally increases with regions population sizes, and seem to be more essential in creative industries than in others. Scale effects such as constant circulation of information are especially important for artists to improve their skills and know-how. They also argued that benefits of spatial proximity tend to have a larger impact on creative industries than on other sectors, due to increased importance of agglomeration economies of production and consumption. The production effects are mainly results of experience-based “tacit” knowledge that takes place

when musicians, artists, etc. meet, interact and learn from each other (Kim, 2007). The agglomeration economy of consumption is a result of a constant dependency of localized consumption within creative industries (Andersson and Andersson, 2006). Galleries, live concerts, theaters, etc. are examples of activities that are getting more difficult to consume as distance increase.

Andersson and Andersson (2006) also pointed out benefits of economies of scope as a cluster incentive, in the sense that several products can come from the same production process. One example is the cost of cultural facilities. Sharing those cost with other activities can be a good, more affordable solution. The Disney Corporation is another commonly used example to demonstrate scope effects. They buy the copyrights of literature and produce a broad variety of products such as movies, magazines, toys, videogames, etc.

According to Florida et al. (2011) scope effects are more prominent in innovative sectors, while matured industries usually benefit more from scale effects. They investigated the scope effects on the entertainment industry and noted a declining pattern of positive scope effects, and argued that the industry might be in a transition from an innovative to a matured industry. Their result indicated that geographies of scope still matter, but only when combined with scale effects.

Jacobs (1961, 1969) among other urban theorists approached creative clustering from a slightly different angle, arguing diversity to be a more important variable to create innovation and economic development. She claimed this to lead to unexpected combinations of knowledge, because when individuals more often meet with people of a diverse nature, they more likely become creative and innovate. She highlighted four neighborhood conditions to be especially important for this development (Jacobs, 1961). The four conditions were; a high population density, diversity in the “primary” areas of people’s everyday life (offices, shops, dwellings, etc.), diversity of street blocks (e.g. shorter blocks) and diversity of the city architecture.

Inspired by Jacobs’s ideas Bianchini and Landry (1995) introduced “the creative city” and “the creative city index”. Andersson and Strömquist (1989) argued that infrastructure links to other creative cities is an important factor for clusters in creativity and knowledge to evolve. Scott’s (2000) “cultural commodity production” showed how high levels of human capital input can result in clusters, when organized as temporary networks of small firms. It gives possibilities for partnerships and alliances to dissolve and reconstruct on a regular basis. Psychologist Simonton (1984) analyzed different types of social interactions to get a deeper understanding in, to what degree, and how, creativity comes from these, proposing creative cities to both attract creative people and simulate those already there.

2.2 Why are Face-to-Face Interactions still important?

Classical location theorist Weber (1909) suggested the main reasons behind clustering of industries to be a way to minimize transport costs. The cost of transportation is significantly smaller in today’s society, but there are still spatial frictions when working with people far away.

Andersson and Andersson (2006) argued that spatial friction and property rights ambiguity are the two main reasons to why it is beneficial for producers and consumers to cluster.

Spatial friction refers to the costs of transport and other spatial costs such as, production of land, labour, capital, knowledge search, contracting, monitoring and enforcement. Property rights ambiguity briefly means that the uncertainties and difficulties to uphold property rights in creative industries, cause territorial public goods and knowledge spillover to arise in certain locations and benefit the ones located there.

If location had zero impact and meant no economic consequences we would have a “flat world” (Friedman, 2005), facing the “death of distance” (Cairncross, 1997). Several studies indicate that the opposite is true (Porter, 2000; Leamer and Storper, 2001). Quah (2000) developed a model of the internet economic geography based on the views of Cairncross and Friedman. The model is assuming a world with zero transport costs, as a result of internet and technology eliminating the downsides of spatial separation. Nevertheless, he discovered that even if spatial distance would be irrelevant, the world would still be characterized by industry clusters as a result of inconvenient time-zones.

Leamer and Storper (2001) did not regard the upcoming digitalization and the fast technological expansion, as an indication for distance and location of economic activity to lose its significance. They saw the increased amount of trade through faster transportation and better methods of communication, as an era causing an even finer division of labour. This would instead stimulate and increase the degree of economic concentration rather than decrease its importance. Internet simplifies the methods to find workers with the demanded competences and increases the importance of coordination. Coordination benefits from long-term contracts, thus in turn benefit from face-to-face contacts (Leamer and Storper, 2001).

Moreover, Internet has made it even more important to build a good personal network in order to find information about job opportunities, support for upcoming projects and other knowledge transfers (Neff, 2005). Johnson et al. (2002) described how the importance of “know-how” (experienced-based knowledge) and “know-who” (knowledge about who knows what and what to do) rises together with a fast development of more complex products and production processes.

Wittel (2001) found that an ongoing face-to-face communication is fundamental for creative individuals to inspire, reproduce and develop. For example musicians find it easier to exchange ideas on music production when playing and experimenting face-to-face rather than sharing their views in writing (Cummins-Russell and Rantisi, 2011). An additional positive aspect of these interactions is an enriched atmosphere, arising from a close proximity of artists, generating new creative thinking (Bain 2005). Frequent interaction in local contexts leads to long-lasting network relations and promotes new knowledge and opportunities. (Wichmann Matthiessen et al., 2011). Thus, much research indicate that face-to-face interactions between artists are necessary (Asheim et al., 2007; Florida, 2002), temporary meetings or unplanned interactions in places such as cafés, bars, conference, music festivals, etc. could as well work as stimulating factors (O’Grady and Kill, 2013).

2.3 Path Dependency

An increase in cultural production and consumption can change a city’s symbolic brand. A region can through concert halls, theaters, galleries as well as cafés, bars, clubs, shopping malls experience increased property values, increased employment and an overall more attractive environment for investments (Scott, 2001). A region endorsing such places to be-

come rooms of interaction for exchange of ideas satisfies one of the conditions behind the “cultural industry cluster building” (Hallencreutz and Power, 2002). A growing trend of industry-specific knowledge, labour and new ICT developments can also have the power to tie people within that industry to the region (Scott, 2004). Hendersson (1995) argued that there is a correlation between past and future specialization patterns. If a region specializes in a certain industry, it results in the development of an infrastructure more accessible for that industry, which in terms of culture, could be: rehearsal premises, high level of instrument provision, accessibility to new technology, etc. (Hallencreutz et al., 2004). A broad knowledge base is predominant in industries that create innovation through new combination of existing knowledge (Asheim and Gertler, 2005). Asheim (1996) argued factors endorsing and restraining the formation of sufficient learning capacity to enable a transition from industrial districts to learning regions. Cooke et al. (1997) focused on elements stimulating regional innovation systems.

One explanation behind Sweden’s large music exports is the “ABBA-effect”¹. Johansson (2010) discussed the impact of role models like ABBA. In the same way that sport stars such as Björn Borg and Ingemar Stenmark created an extraordinary interest in tennis and alpine skiing. Sweden started to develop several prominent successors in sports where the country previously experienced little international success. However, the first worldwide hit after ABBA did not happen until over a decade later (1986), with Europe’s *The Final Countdown*. Johansson (2010) saw this as a reason to question this argument, suggesting that investing and developing a nation’s cultural infrastructure is a more likely reason for clusters to evolve. He claimed that the government not only has responsibilities in financing cultural programs, they should “play the role as cluster drivers” as well.

Gertler (2004) pointed out the government’s importance, by arguing a need for regulatory support for cultural activities, in order to create a socially inclusive and well-designed trail to a creative, competitive city. Bathelt and Shuldt (2005, 2008) examined “the global buzz” (i.e. attractiveness through reputation and image) and its effects on clustering. They proposed that it creates an increasing flow of information and knowledge, improving the chances of meeting people and potential partners from other parts of the world. Pratt’s (2002) research of the new media cluster in San Francisco is based on theories of the same nature. He investigated the impact of a city’s ability to brand itself as a leader within an industry, making people regard it as a “cool” place, increasing the region’s attractiveness. Moreover, Glaeser et al. (2001) suggested clustering and urban density to have positive effects on a region’s attractiveness. Cultural clusters have a particularly strong capability to brand regions a specific product, such as Hollywood films and New York art (Currid-Halkett, 2007).

Florida (2002) created an increase in the interest of creative clustering. Inspired by the work of Jacobs (1961) and Brooks (2000) among others, he investigated the location patterns of creative people across American metropolitan regions. He discovered that cities with an overrepresentation of the “creative class” experienced a faster economic growth than the national average. According to Florida (2002), the “creative class” is composed by a “super

¹ ABBA’s music and international success inspired and influenced a new generation of Swedish music.

creative core” and “creative professionals”. The “super creative core” is occupations involving computers, mathematics, architecture, engineering, as well as occupations within social science, education, training, library, arts, design, entertainment, sports and media. The “creative professionals” refers to jobs in management, business and finance, as well as law and health care occupations.

The “creative class” includes people who add economic value through their creativity. In this post-industrial, more knowledge-based world, a “super-creative core” becomes of great importance. In an urban growth model (The 3 T’s), Florida describes how talent, technology and tolerance are the essential foundations to economic growth and to attract creative people. He further argued that creative people find diversity and creative cities desirable enough to disregard a job offer in another region that does not meet their demands. They are often either entrepreneurs or less eager to get long-term employment. Moreover, he says that employers have begun to be aware of this and are locating in cities where they believe the “creative class” wants to live (Florida, 2002).

However, Hansen and Nedomysl (2009) argued that the migration dynamics of the “creative class” in Sweden differ from Florida’s theory and only have a marginal effect on where those in creative occupation decide to live. The Swedish population regards work and social reasons as more important factors fostering relocation (Nedomysl, 2008). Asheim (2009) pointed out the Swedish organized market economy as one possible explanation. He argues that it does not allow for the same opportunities to be as dynamic and mobile as the American more liberal market. Hallencreutz and Lindeqvist (2002) suggested the concentration of industry specific competences, meeting places, live venues as well as media and IT companies to be a more likely cause behind creative clusters in Sweden than a the “creative class”. On the other Mellander and Florida (2009) found the “creative class” to have a stronger relationship to per capita regional wage than educational measures.

2.4 Hypotheses

In light of previous research on location patterns in culture and creative industries, this thesis examines the following relationships regarding the spatial distribution of cultural workers in Swedish municipalities:

H₁: The regional share of cultural workers is expected to be positively related to population size and average income.

Previous literature suggests that municipalities with a higher aggregate demand to have a higher regional share of cultural workers. It is based on the assumptions that live consumption of culture is becoming more difficult to consume as distance increases and that culture benefits from economies of scale.

H₂: The regional share of cultural workers is expected to be positively related to the share of local governments’ budget spending on culture.

Theory suggests that municipalities with local governments investing more in culture are developing an environment that is easier for culture to operate in. Therefore, this thesis expects to find an overrepresentation of cultural workers in municipalities where the local government invest more in culture.

H₃: The regional share of cultural workers is expected to be positively related to municipalities' regional share of cultural facilities.

Previous literature suggests that live activities are sensitive to distance and in need of a high demand to survive its often high fixed costs. Therefore, this thesis expects that municipalities with an overrepresentation of cultural workers in the past to have an overrepresentation of cultural workers today.

H₄: Culture workers are expected to be path dependent.

Precious literature suggests that the current location of culture depends on past location patterns. Therefore, this thesis expects cultural workers to be overrepresented in municipalities that have been overrepresented by culture in the past.

H₅: The number of different cultural occupations is expected to be positively related to population size and average income.

Previous theory suggests that economies of scope exist in combination with economies of scale. Population and average income are scale parameters, representing a higher aggregated demand. The variety of culture is a scope parameter, representing benefits from cooperation and a joint production process as well as knowledge spillover and shared fixed costs.

H₆: The number of different cultural occupations is expected to be positively related to municipalities with a greater regional share of cultural facilities.

Theory suggests that high fixed costs in cultural facilities decrease with a joint production process by a common production process with similar cultural industries.

H₇: The number of different cultural occupations is expected to be positively related to the variety of culture in the past.

Theory suggests the location of culture to be path dependent.

3 Method

This section describes the empirical models, the variables included in the model and the methodology in the empirical research.

3.1 Description of Variables

The models are based on data from 2011, if nothing else is stated, and cover all of the 290 Swedish municipalities. The variables are based on what is suggested in previous literature to have a significant influence on regional culture distribution. However, all variables were positively skewed in their residuals, and are therefore all in their logarithm form.

Table 1-Description of Variables

Variables	Description
Culture _s	Concentration of cultural workers in municipality s
CultureVariety _s	The number different culture occupations with registered workers in municipality s
POP _s	Population size in municipality s
AverInc _s	Average income in municipality s
GEXP _s	Share of local government expenditures invested on culture in municipality s
CulturalFacilities _s	Concentration of cultural facilities in municipality s
Culture2000 _s	Concentration of artistic industries in municipality s (2000)
Culture1990 _s	Concentration of artistic industries in municipality s (1990)
Diversity _s	Share of foreign-born population in municipality s
Tolerance _s	Tolerance grade of municipality s

Dependent Variables

Culture_s

This variable is based on occupational data for 2011 and is a location quotient for workers registered in occupations within the categorical group Writers and Creative or Performing Artists (See Table 2) in the Swedish Occupational Classification (SSYK 96). A value of 1 denotes that the municipality's share of cultural workers in relation to its working population equals the national average. A value above 1 indicates an overrepresentation of cultural workers, while municipalities scoring below 1 are underrepresented in terms of cultural workers. The data is from Statistics Sweden's system for Regional Analysis and Forecasts (RAPS).

CultureVariety_s

The following variable examine the effects of economies of scope on the location of cultural workers

It is the dependent variable of the second model, and examines the effects that economy of scope has on cultural workers location patterns. It is based on the same occupational data for 2011 as (*Culture*), but does categorize the municipalities by the variety of cultural occupations. By variety is meant, how many of these 6 occupational groups (Table 2) a municipality has registered workers in. A municipality that has registered workers in all of these groups is classified by a (6), while a municipality with registered workers in one these groups is classified by a (1). It is used as an ordinal variable, because it is assumed to be ordered rather than categorical. A (2) and a (3) are expected to get closer results than a (2) and a (4).

Table 2-Standard for Swedish Occupational Classification² (SSYK 96)

2451	Authors, journalists and related professionals
2452	Sculptors, painters and related artists
2453	Composers, musicians and singers
2454	Choreographers and dancers
2455	Film, stage and related actors and directors
2456	Designers

Explanatory Variables

The following variables examine the effects of economies of scale on the location of cultural workers.

POP_s

(POP_s) represent population size and tests for scale effects related to population size. It comes from Statistics Sweden.

AverInc_s

(AverInc_s) represents average income data for the Swedish population older than 16. It tests for scale effects created by income and comes from Statistics Sweden.

The following variable examine the impact of industry specialization

GEXP_s

(GEXP_s) represents the average share of local governments' expenditure invested in cultural activities during a period of five years (2007-2011). The data is based on reports from The Swedish Art Council and The Swedish Agency for Cultural Analysis on Society's Cultural Expenditure. The Swedish Art Council stopped releasing these reports 2009 and was replaced by The Swedish agency for Cultural Analysis. (GEXP_s) tests the local government's cultural investments effects on the share of cultural workers. Unfortunately, no data on local governments' expenditure on culture is available before 2007.

² Translation: Standard för Svensk Yrkesklassificering

CulturalFacilities_s

(*CulturalFacilities_s*) is a location quotient, based on industry data. It represents the number of employees registered in the Operation of Cultural/ Art Facilities Industry, and is based on the Swedish Standard Industrial Classification (*SNI 2007*). It contains the operation of concert halls, opera houses, theaters, etc. and tests for the effects of a municipality's cultural industry specialization in relation to cultural facilities.

It tests for scale and scope effects under the assumptions that cultural facilities are distance sensitive and in need of a high demand to overcome high fixed costs through exploiting economies of scale. Moreover it can exploit economies of scope by sharing high fixed costs with other cultural activities (Andersson and Andersson, 2006).

The following variables examine the effects of path dependency

Culture2000_s, Culture 1990_s

They are location quotients representing the number of employees registered as cultural workers in Artistic and Literary Creation and Interpretation Industries. They are based on industry data instead of occupational data because The Standard for Swedish Occupational Classification (see Table 2) does not have registered data for 2000 or 1990. These variables are instead based on Swedish Standard Industrial Classification (*SNI 92 and SNI 69*) and test for path dependency effects.

Control Variables

Diversity_s

This variable represents the foreign-born population share and tests the relationship between the share of foreign-born population and the location of cultural workers. It is based on the assumption that diversity is an attractive feature for cultural workers. The data is from Statistical Sweden.

Tolerance_s

This variable is one of Florida's (2002) three T's attractive the "creative class" and as in Mellander and Florida (2009), it is based on The Swedish Federation for Lesbian, Gay, Bisexual and Transgender Rights' reports. The data is an average number of their municipality research on LGBT rights from 2006 and 2014. They grade all municipalities based on efforts made by local governments, schools, education to improve LGBT rights, as well as the amount of hate crimes and the overall LGBT infrastructure and attitudes.

3.2 Methodology

To investigate the economic geography of culture, this thesis first illustrates the location of cultural workers in 2011 through a descriptive analysis and a box plot, providing a broad overview of what the spatial distribution of cultural workers in Sweden looks like.

The reasons behind that distribution are further examined in a bivariate correlation analysis for a first indication how the independent variables correlate with the dependent variable. Correlations amongst the independent variable are also examined. Highly correlated independent variables indicate that they explain the dependent variable with similar explanatory power, raising potential concerns of multicollinearity.

Any possible indications of multicollinearity observed from the bivariate correlation analysis, is in the regression analysis further investigated by studying the variables' variance inflation factor (VIF). The VIF value represents how many times larger variance of the independent variable is, compared to what it would be if it were linearly independent. A common rule of thumb for detecting multicollinearity is 4 (O'Brian, 2007).

Finally, a weighted least square regression is used to examine how the independent variables affect the location of cultural workers across Swedish municipalities. The municipalities' population sizes are heterogeneous, creating heterogeneity in the data. This violates the assumption of constant variance in the error terms, making the ordinary least squares (OLS) standard errors invalid and the confidence intervals biased. This is dealt with, by running a weighted least square (WLS) estimation with population as the weight variable. This decreases the heterogeneity, producing more correct standard errors and more efficiently estimated coefficients.

What is mentioned above is complemented by a second regression studying the number of different cultural occupations in Swedish municipalities. It is an ordinal logit regression analysis, since the dependent variable (*CultureVariety*) is based on ordinal data. An ordinal logit regression goes under the assumption of proportional odds, which briefly explained, is an assumption of the dependent variable to follow an ordinal rank, by testing if the cumulative logits have the same beta values. This is tested in a "parallel lines test" with the null hypothesis stating the location parameters (slope coefficients) to be the same across response categories. Not rejecting the null means that the assumption of proportional odds is met.

3.3 Empirical Model

Two empirical models are used to test the hypotheses. The first model investigates the concentration of cultural workers in two regressions, where s represents municipality s . The first is a weighted least squares model with population as the weight variable.

$$\text{LnCulture}_s = \beta_0 + \beta_1 \text{LnAverInc}_s + \beta_2 \text{LnGEXP}_s + \beta_3 \text{LnCulturalFacilities}_s + \beta_4 \text{LnCulture2000}_s + \beta_5 \text{LnCulture1990}_s + \beta_6 \text{LnDiversity}_s + \beta_7 \text{LnTolerance}_s + \varepsilon$$

The second model studies the variety of culture in an ordinal logit regression under the assumption that *CultureVariety* is an ordinal variable. An ordinal logit regression model uses cumulative probabilities (Norusis, 2012). That is the cumulative probability for the outcome of the dependent variable *CultureVariety* to end up in ordinal category j or $\text{er } [P(y \leq j)]$. Since *CultureVariety* can take on 6 values; $[P(y = 1), [P(y \leq 2)] = [P(y = 1)] + P(y = 2)]$, and so on until $P(y \leq 6)$. The left side of the equation represents the logit for probability P .

$$\ln \left(\frac{P(\text{CultureVariety} \leq j)}{1 - P(y \leq j)} \right) = \alpha_j - (\beta_1 \text{LnPOP}_s + \beta_2 \text{LnAverInc}_s + \beta_3 \text{LnGEXP}_s + \beta_4 \text{LnCulturalFacilities}_s + \beta_5 \text{LnCulture2000}_s + \beta_6 \text{LnCulture1990}_s + \beta_7 \text{LnDiversity}_s + \beta_8 \text{Tolerance}_s)$$

α_j represents the intercept for logit j (1 - 6). All cumulative logits are assumed to have the same β -value (Norusis, 2012). The cumulative probability increases as j increases, which re-

sults in the intercept α_j to increase. This ordinal logit model consists of 6 different equations, one for each possible value of *CultureVariety*.

4 Empirical Findings

This section presents the empirical results of the study. It starts by providing a brief overview of the data with descriptive statistics and a box plot. It is followed by a correlation analysis and ends with a discussion of the results from the two regression analysis.

4.1 Descriptive Statistics

The descriptive data presented in Table 3 gives an overview of the examined variables' minimum, maximum and mean values, together with their standard deviations. The variables are all expressed in their original forms. The zero values in *CultureFacilities*, *Culture2000* and *Culture1990* are given a small value (0.001) when log transformed.

Table 3-Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Culture	290	0.086	2.751	0.536	0.308
CultureVariety	290	1.000	6.000	4.040	1.043
POP	290	2,431	864,324	32,700	66,016
AverInc	290	189,400	450,500	233,500	30,151
GEXP	290	0.960	4.580	2.108	0.518
CulturalFacilities	290	0.000	21.920	0.243	1.421
Culture ₂₀₀₀	290	0.000	3.050	0.441	0.338
Culture ₁₉₉₀	290	0.000	21.486	0.825	2.185
Diversity	290	0.038	0.398	0.112	0.055
Tolerance	290	1.000	4.230	1.986	0.514

A box plot (see Figure 1) illustrates the municipalities with the highest concentration of culture in relation to population. The line within the box represent the median, while above and below this line represent the upper and lower quartiles. The marked regions are outliers where Simrishamn (1.161) is the first one, just outside the maximum point.

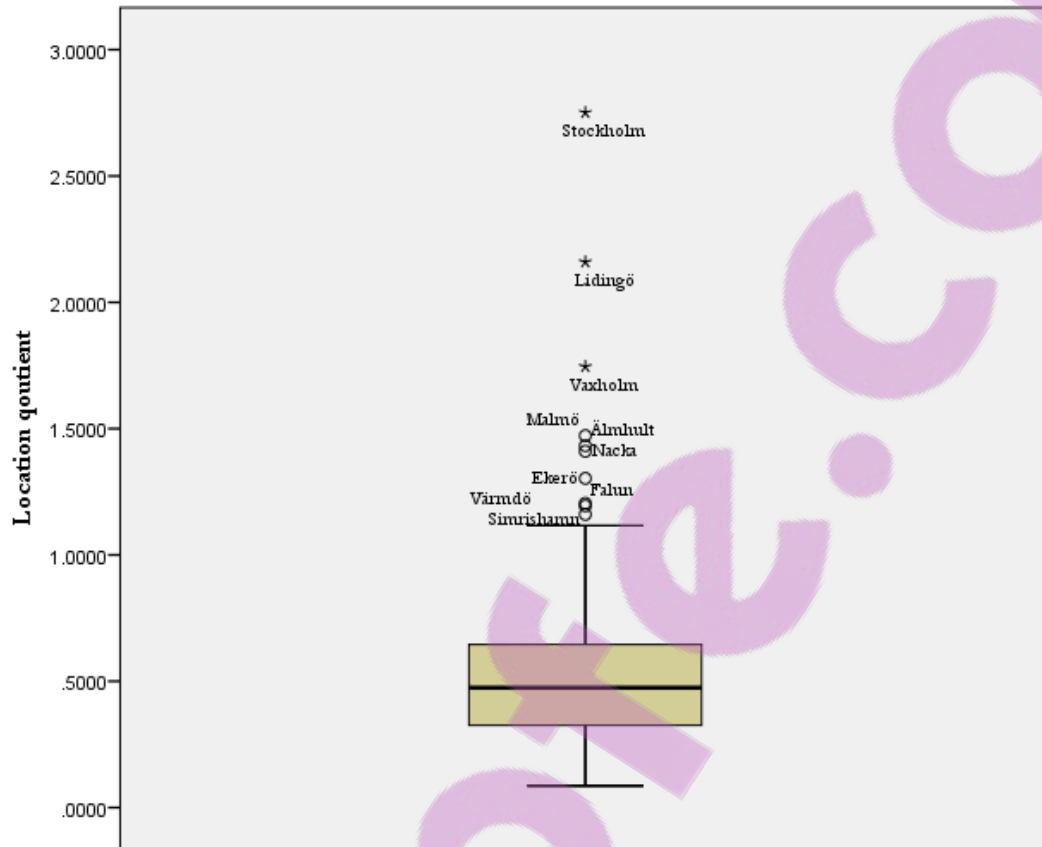
Access to a high populated region is a common factor for the majority of the outliers. The municipality reaching the highest location quotient (2.751) of cultural workers is Stockholm, which is followed by Lidingö and more within the Stockholm region, together with Sweden's third most populated municipality, Malmö.

Guthenburg is the second most populated municipality, but not noted as an outlier. It is situated right underneath the point to be marked as an outlier with a location quotient of 1.091. Älmhult, Simrishamn, and Falun are exceptions in terms of population size that all can be observed in Figure 1 as outliers despite their small population sizes.

The municipalities with the lowest concentration of cultural workers follow the same pattern. Municipalities with small population sizes have low location quotients. Perstorp, Bjurholm and Laxå are the bottom three. Bjurholm is Sweden's smallest municipality (2011) with 2431 inhabitants.

Culture2000 had similar outliers as *Culture2011*³, Stockholm first, Lidingö second and Malmö third. *Culture1990* had Gothenburg as the municipality with the highest concentration of culture, followed by Lidingö and Malmö. However, the overall pattern is slightly different, in the sense that different municipalities are marked as outliers in 1990 compared to the top culture concentrated municipalities in 2011 and 2000⁴.

Figure 1- Boxplot of the concentration of cultural workers in 2011



Further by looking at Table 1 again, the top location quotient for *Culture1990* and *CultureFacilities* appears disproportionately high. Limited data with several municipalities having zero observations lowered the national average. Hence, the municipalities with the highest share of cultural workers in relation to their working population might have got a location quotient that is higher than what it would have got with more observations and overall better data. They are nevertheless not excluded in the models, since the relation between the municipalities still give indications of their influences on culture and cultural variety.

A frequency table of *CultureVariety* is found in the appendix⁵. Bjurholm and Åsele are the only two municipalities with registered workers in only one of the six culture occupations, while 19 municipalities have registered workers in all six occupations⁶.

³ See Figure B1 in appendix for boxplot for concentration of culture in 2000

⁴ See Figure B2 in appendix for boxplot for concentration of culture in 1990

⁵ See Table A1 in appendix for frequency table of *CultureVariety*

⁶ Stockholm, Gothenburg, Malmö, Uppsala, Västerås, Örebro, Umeå, Eskilstuna, Nacka, Botkyrka, Karlstad, Solna, Sollentuna, Falun, Nyköping, Lidingö, Värmdö, Härnäs, Klippan

The concentration of cultural facilities is highest in Botkyrka. Danderyd is the municipality with the highest average income, Årjäng the lowest. The local government in Helsingborg invests the largest share of their budget on culture (4.58 %), while Nordanstig only invest 0.96%, representing the national low. Haparanda got the highest regional share of foreign-borns (39.85%), and Lekeberg is the least diverse municipality in terms of foreign-born population (3.84%). Gothenburg got the highest grade on the Tolerance-index (4.23), while Tingsryd and Norsjö both got the lowest (1.00).

4.2 Correlation Analysis

The correlations between the dependent and independent variables, used in the model are summarized in a bivariate correlation matrix below. All variables are in their logarithm form.

Table 4-Bivariate correlation matrix

	Culture	POP	AverInc	GEXP	Cultural Facilities	Culture2000
Culture	1					
POP	0.799**	1				
AverInc	0.503**	0.397**	1			
GEXP	0.450**	0.476**	-0.084	1		
CulturalFacilities	0.661**	0.714**	0.154**	0.540**	1	
Culture2000	0.946**	0.829**	0.467**	0.504**	0.618**	1
Culture1990	0.519**	0.663**	0.213**	0.348**	0.480**	0.561**
Diversity	0.440**	0.653**	0.637**	0.281**	0.462**	0.462**
Tolerance	0.631**	0.831**	0.172**	0.435**	0.658**	0.684**
	Culture1990	Diversity	Tolerance			
Culture1990	1					
Diversity	0.342**	1				
Tolerance	0.633**	0.536**	1			

Note: Significance level: ** 1%, * 5%,

All independent variables show a significant positive correlation to *Culture*. The variables with the highest correlation coefficients are *POP* (0.799), *CulturalFacilities* (0.661) and *Culture₂₀₀₀* (0.946). Furthermore, *POP* is highly correlated to the other independent variables, especially *CulturalFacilities* (0.714), *Culture2000* (0.829) and *Tolerance* (0.831) thus, indicate multicollinearity.

Culture have the strongest correlation to *Culture2000* (0.946), which indicates that culture have stayed in municipalities with already high concentration of cultural workers the past decade. Cultural workers appear to have been more mobile during the 1990s based on the much lower correlation between *Culture2000* and *Culture1990* (0.561).

4.3 Regression Analysis

This section is divided into two parts. The first section is a weighted least square regression the location pattern of cultural workers. The second section studies the variety of culture in an ordinal logit regression.

4.3.1 Weighted Least Squares Regression

Before the weighted least squares regression, an ordinary least squares regression including *POP* is performed. *Culture2000* is the only variable showing a positive significant influence on *Culture*. However, except from introducing heterogeneity in the data, *POP* does not show a significant relationship to *Culture*.

Therefore, the second regression is a weighted least squares with *POP* as the weight variable. All variables got a slight increase of their VIF values, but none reaches above 4. The R-squared increased and there are now three variables showing significant positive estimates to culture; *Culture2000*, *CulturalFacilities*, and *AverInc*.

Table 5-Regression Results

Culture	(1)	VIF	(2)	VIF
Constant	-3.043** (-3.373)		-2.386** (0.722)	
POP	-0.011 (-.349)	3.256		
AverInc	0.246 (-1.396)	1.618	0.435** (3.586)	1.698
GEXP	-0.066 (-0.849)	1.539	-0.074 (-1.216)	1.824
CulturalFacilities	-0.008 (-0.513)	1.369	0.035** (4.020)	2.204
Culture2000	1.237** (18.540)	2.029	0.691** (25.992)	3.333
Culture1990	-0.005 (-0.588)	1.344	-0.010 (-1.553)	1.769
Diversity	-0.132 (-3.248)	1.203	-0.036 (-1.246)	1.460
Tolerance	0.045 (0.469)	2.032	0.061 (0.995)	2.820
R2	0.717		0.906	
N	290		290	

Note: Significance level: ** 1%, * 5%, T-statistics in parentheses

The first hypothesis stated that cultural workers should be overrepresented in bigger cities with a high demand, based on the assumption that culture benefits from economies of scale. Average income shows a significant positive relationship to the location of cultural workers, which is in line with this and the previous literature. A higher average income suggests that people have more money to spend on culture and by that drives up a municipality's aggregate demand.



On the contrary, population size did not show any significant relationship to the location of culture in 2011, which disagrees with previous research. The variable's strong correlation to *Culture2000* (see Table 4), could suggest that cultural workers still, to a large extent, locate in densely populated regions, but that the location of culture in 2011 is more affected by the location pattern of culture in the past decade, than of population size.

A significant relationship to culture in 2000 together with an insignificant relationship to culture in 1990 indicates that the location of culture today is affected by the location of culture 10 years ago, but not as much by the location of culture 20 years ago. Moreover, population shows a higher correlation to culture in 2000 (0.829), than to culture in 1990 (0.663) in the correlation analysis (see Table 4). This might indicate that cultural workers' speed of urbanization were greater during the 1990s than between 2000 and 2011. However, this is not in line with the Swedish population as a whole, and nothing that has significant proof in this study. It is merely a discussion of the possible explanation regarding the population variable's insignificance in the regression model of this study.

The hypothesis that culture benefits from economies of scale and locate in more populated regions with a high demand cannot be rejected. Municipalities with an overrepresentation of cultural workers have a higher average income, which suggest that the hypothesis is not rejected, even though population size did not show a significant relationship to the concentration of culture.

The second hypothesis stated that municipalities with a local government who spend more on culture per capita will have a higher regional share of culture and cultural workers. *GEXP* is an average of local governments' expenditures on culture from 2007 to 2011. It does not show any significant relationship to cultural workers in 2011. Hence, this hypothesis is rejected. However, if the variable were to include more than just five years back in time, the result might be different.

The third hypothesis stated that the regional share of cultural facilities is expected to have a positive influence on the regional share of cultural workers. *CulturalFacilities* shows a significant positive relationship towards *Culture*, which means that increasing the share of local expenditure on culture, still is beneficial in order to attract cultural workers. However, this data does not say whether these facilities are financed by public or private investors. Hence, this thesis can only conclude that the local governments' expenditures on culture during the past five years have not affected the location of culture in a significant way. Even though cultural facilities show a positive relationship to culture, that is significantly more than zero.

If cultural facilities significance is due to scale or scope effects is difficult to say, but its high correlation to population (see Table 4) indicates that it is more likely to be a result of economy of scale. Culture facilities represent live activities, which are getting more difficult to consume as distance increase. It is highly distance-sensitive and depends on local consumption.

The fourth hypothesis said that the place of culture in the past affects the place of culture today. It is assumed that past location patterns affect future location patterns. As been mentioned above, *Culture2000* showed significant relationship to *Culture*, while *Culture1990* did not. *Culture2000* showed the strongest correlation to *Culture* (0.946) in the correlation analysis (see Table 4) and with a very high t-statistic reaching values over 20 (see Table 5), the place of culture in 2011 appears to be heavily dependent on the place of culture in 2000. The insignificant value of *Culture1990* suggests that the path dependency of culture in

2011 were lower to 1990 than to 2000. The correlation between *Culture* and *Culture2000* is considerably higher than the correlation between *Culture2000* and *Culture1990* (See Table 4).

The reasons why cultural workers were more path dependent the past decade compared to the 1990s, are difficult to determine based on this study. However, it is an indication of that path dependency of culture in Sweden has become stronger. The location patterns of cultural workers in 2011 are highly dependent on the location of cultural workers in 2000, while not showing a significant relationship to the location of cultural workers in 1990.

Nevertheless, this thesis can determine that culture has gotten more path dependent during the past decade, compared with two decades back. If this is a pattern that stretches further back in time cannot be determined in this study. It could be a result of the digitalized society reducing the importance of changing location, or the result of an increasing specialization pattern in Swedish municipalities. The significant relationship to cultural facilities indicates that the second alternative is more likely. It is based on the idea that an overrepresentation of cultural facilities is a sign of specialization.

Control variables *Diversity* and *Tolerance* do not show a significant influence to *Culture*, despite showing significant correlation (See Table 4). Their insignificance support previous research on the “creative class” influence on creative occupations location patterns in Sweden (Hansen and Niedmoysl, 2009; Asheim.) The reasons behind their insignificance are difficult to determine in this study.

Based on the significant values from *CulturalFacilities*, *AverInc* and *Culture2000* more probable reasons behind cultural clustering appear to be specialization and scale benefits, which supports Hallencreautz and Lindequvist (2002).

4.3.2 Ordinal Logit Regression

This sub section studies what variables that affect the variety of culture occupations. The dependent variable *CultureVariety* is tested against the same variables as in the WLS in order to investigate the hypotheses of economies of scope.

The “test of parallel lines” shows that the null hypothesis cannot be rejected, thus the proportional odds assumption is met and the ordinal logit model fits⁷. The threshold parameters represent the intercepts for each of the ordinal outcome. The intercepts can differ as long as the slope for each variable stays constant in a pattern of parallel lines (O'Connell, 2006). The odds-ratio is the exponential value of the estimated logits and represents the change in odds for a unit increase in one of the predictors. A value of 1 or close to 1 implies a non-significant relationship to the variety of culture.

The fifth hypothesis stated that the number of different cultural occupations expected to be positively related to population size and average income. It is assumed that scope effects are present when combined with economies of scale.

Population size and average incomes show positive significant values to the variety of culture occupations, which mean that municipalities with a larger population size are more likely to have a broader range of cultural workers.

Since population size and average income represent economies of scale, this suggests that *CultureVariety*'s benefits from economies of scope are likely dominated by benefits from

⁷ See Table A2 in appendix to observe the test of parallel lines

economies of scale. Bigger regions with a higher average income and by that, a higher aggregate demand, are more likely to have a broader variety of culture.

The sixth hypothesis stated the number of different cultural occupations to be positively influenced by cultural facilities, based on the idea that different culture occupations wants to cooperate and coproduce in order to get around the venues' high fixed costs.

Cultural facilities do not show a significant result to the variety of culture. This is a further indication of benefits of economies of scope to be a result of the benefits from scale effects. Cultural facilities insignificant value to *CultureVariety* in comparison to its significant relationship to *Culture* (see Table 5) indicates that cultural facilities are driven by scale effects more than scope effects

The seventh and last hypothesis stated that the variety of culture should be positively related to the place of culture in the past, based on the assumption of the location of culture to be a function of its past. The results support this by showing a positive significant value to *Culture2000*. The variety of culture appears to be dependent of the place of culture in 2000, but not on the place of culture in 1990, which is similar to the results from Table 5.

Table 6-Ordinal logit-Regression Results

Variables	Odds ratio	z
POP	5.928**	6.990
AverInc	19.09*	2.230
GEXP	0.534	-1.090
CulturalFacilities	1.026	0.200
Culture2000	2.399**	3.980
Culture1990	1.055	0.850
Diversity	0.962	-0.130
Tolerance	1.080	0.110
Estimated threshold parameters		
CultureVariety = 1	25.157**	
CultureVariety = 2	27.909**	
CultureVariety = 3	30.464**	
CultureVariety = 4	33.026**	
CultureVariety = 5	36.739**	

Note: Significance level: ** 1%, * 5%

5 Conclusion

Based upon current research stressing creativity's increased importance for regional growth, this thesis aims to understand what economic factors that affect the place of culture and creative people in Sweden.

Research on why creativity and culture tend to cluster contains classical economic geographic theories such as, economies of scale and economies of scope. Cultural workers or industries do according to theory benefit from scale effects, and should be drawn to regions with a higher aggregate demand. Cultural workers want to exploit economies of scope by cooperate with other cultural occupations in order to solve problems of expensive venues and receive mutual gain of knowledge spillover. Furthermore, research suggests that past specialization patterns, affect future specialization pattern. Regions with a history of culture are assumed to be more likely to keep their cultural heritage and have a higher regional share of culture today. A higher regional share of cultural facilities and local governments investing a larger share of their budget on culture are other factors mentioned to be positively related to culture in previous research.

The spatial distribution of culture is based on where in Sweden cultural workers lived in 2011. Two regressions are run, where the country is divided into its 290 municipalities. The first studies the concentration of culture in a weighted least squares regression. The results show that average income is positively related to location of cultural workers. The people in the municipalities with a higher average income have more money to spend on culture, thus increasing the demand. This is according to the literature and an additional evidence of that culture and creativity benefits from exploiting economies of scale. Moreover, the share of government expenditures spent on culture was not found significant to attract cultural workers. On the other hand, cultural facilities showed a positive relationship to the place of culture, which implies that municipalities with more money invested in culture, could still be a way to attract cultural workers. Furthermore, the place of culture in 2000 is also showing a positive relationship to the place of culture in 2011. This path dependency is an additional indication of specialization as a factor of importance, to attract cultural workers.

The second regression is an ordinal logit regression and investigates the variety of cultural occupations among the Swedish municipalities. The results showed significant positive relationships of population, average income and culture in 2000 to the variety of culture. The variety of culture appears to be driven by similar forces as the concentration of culture. The significance of average income and population size together with a non-significant relationship to cultural facilities indicates that possible scope effects are more likely to evolve when combined with economies of scale.

To sum up, the main findings of this paper is that the economic geography of culture in Sweden is driven by scale effects, access to cultural facilities and past dependency. However, this paper could not find support on increased local government expenditures on culture as a way to attract cultural workers. This should be investigated into more detail, using data that stretches further back in time. There is a probability that many of these cultural facilities are financed by the state, which should be looked further into and compared to those financed by private investors. A closer study of the historical pattern of path dependency in culture could also be useful. This paper found indications of cultural path dependency in Sweden to be weaker in 1990-2000 compared to 2000-2011. This possible pattern and underlying reasons should be investigated into more detail.

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Appendix

Table A1-Frequency table for CultureVariety

CultureVariety	Frequency	Percent	Cummulated
1	2	0.69	0.69
2	17	5.86	6.55
3	70	24.14	30.69
4	99	34.14	64.83
5	83	28.62	93.45
6	19	6.55	100.00

Table B2-Test of parallel lines

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	590.271			
General	567.111 ^b	23.160 ^c	32	.873

The null hypothesis states that the location parameters (slope coefficients) are the same across response categories.

Figure C1-Boxplots for the concentration of cultural workers in 2000

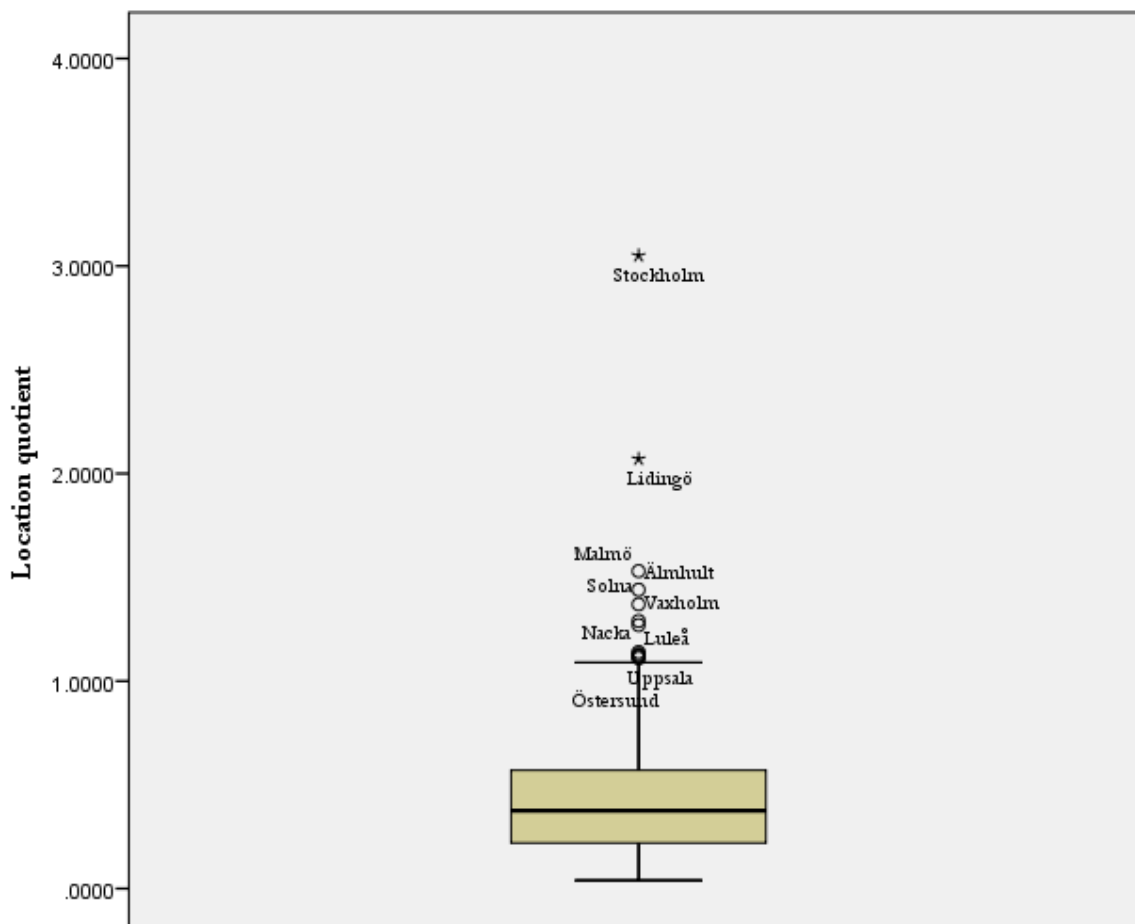


Figure D2-Boxplots for the concentration of cultural workers in 1990

