The Spatial Concentration and Mobility of Creative Individuals in Germany

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Zusammenfassung

Die wirtschaftliche Entwicklung von Regionen hängt maßgeblich von der Fähigkeit ab Humankapital zu generieren und anzuziehen. Dabei ist die räumliche Mobilität von Humankapital als Wachstumsdeterminante in jüngster Zeit in den Fokus der wissenschaftlichen Diskussion gerückt. Hierzu zählen insbesondere die Arbeiten Richard Floridas und seine Hypothese von der "Kreativen Klasse", die in der Wissenschaft kontrovers diskutiert wird. Politiker sowie Praktikern aus Planung und Verwaltung haben seine Ideen hingegen bereitwillig aufgenommen und an diese angelehnte Maßnahmen implementiert. Somit hat die Wirtschaftspolitik schneller agiert als die empirische Forschung die Validität dieses Konzeptes zu prüfen in der Lage war. Dies birgt das Risiko der Fehlallokation öffentlicher Ressourcen in Zeiten begrenzter Mittel der öffentlichen Haushalte.

Die vorliegende kumulative Dissertation setzt sich in Form dreier wissenschaftlicher Publikationen mit Defiziten in der bestehenden Literatur zur Kreativen Klasse auseinander, die bisher zu wenig Beachtung gefunden haben. Diese betreffen vor allem die umstrittene Definition der Kreativen, die unzureichende dynamische Perspektive bisheriger räumlicher Analysen und die mangelnde empirische Evidenz zu den individuellen Wanderungsmotiven Kreativer.

Ein wesentlicher Beitrag der im Kern empirischen Arbeit ist die Überprüfung einiger Annahmen und Thesen Floridas für Deutschland. Im ersten Artikel wird die Definition der Kreativen Klasse in Frage gestellt und eine Alternative präsentiert, die auf einen Konzept aus der Psychologie basiert. Die Forschungsfrage lautet: Welche aus der Literatur zur Kreativen Klasse bekannten regionalen Charakteristika zeichnen das Umfeld Kreativer aus, die anhand des psychologischen Konzepts identifiziert wurden? Der zweite Artikel widmet sich der Dynamik der räumlichen Konzentration Kreativer in Deutschland. Hierbei spielt die relative Bedeutung von harten und weichen Standortfaktoren eine wesentliche Rolle, um die Frage zu beantworten: Welche regionalen Determinanten beeinflussen die räumliche Konzentration Kreativer in Deutschland? Der dritte Artikel analysiert die Motive für räumliche Mobilität von Kreativen. Anhand von Daten aus face-toface Interviews mit Kreativen werden die intrinsischen Motive der Wanderungsentscheidung im Detail analysiert, um Antworten auf die folgenden Fragen zu geben: Warum und wohin wandern Kreative und wie verändern sich die Wanderungsmotive im Lebensverlauf?

Zusammenfassend trägt die Dissertation zur bestehenden Literatur bei, in dem empirische Evidenz für die Ursachen und Wirkung der räumlichen Konzentration und Mobilität Kreativer in Deutschland geliefert wird.

Schlagworte: Kreative Klasse, räumliche Konzentration, inter-regional Mobilität

Abstract

The economic growth of regions mainly depends on the ability to generate or attract human capital. Recently, the spatial mobility of human capital gained considerable attention by scientists. Above all, it is the work of Richard Florida and his hypothesis of the "creative class" which stimulated a controversial debate within the scientific community. However, his ideas appealed to politicians and practitioners from urban planning and administration. Thus, decision-makers and planners tended to adopt his concept before it empirically verified. Florida's concept bears the risk of misallocation of public funds in times of scarce governmental resources. This cumulative dissertation in form of three scientific publications deals with existing deficits in the creative class literature to which too little attention has been paid so far. In particular, the controversial definition of the creative class, the missing dynamic perspective of existing spatial analyses and the insufficient empirical insights into individual migration decision of creative individuals have been neglected.

A significant contribution of this dissertation is the verification of assumptions and hypotheses of Florida in the context of German regions. The first article deals with the definition of the creative class and presents an alternative approach based on a concept taken from psychology. The research question is: Which regional characteristics known from the creative class literature shape the geography of creative individuals identified by the psychological approach? The second article analyses the spatial dynamics of the concentration of creative individuals in Germany. The relative importance of hard and soft location factors is evaluated to answer the question: What are the main determinants of regional concentration of creative individuals in Germany? The third article contends with the inter-regional migration motives of creative individuals. Data from interviews with creative individuals is used to analyse the intrinsic motives of migration decisions in detail. The article answers the questions: Why and to where do creative individuals migrate? How do the migration motives vary over a life time?

In summary, the dissertation contributes to the existing literature by delivering empirical evidence for the causes and effects of the spatial concentration and inter-regional mobility of creative individuals in Germany.

Key words: creative class, spatial concentration, inter-regional mobility

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Chapter 1 Introduction

1.1 Background

The economic growth of nations and regions depends more and more on the ability to generate or attract human capital (Lucas, 1988; Romer, 1990). In the early neo-classic growth model knowledge is implicitly incorporated in form of technological progress. The main production factors in this model are labour and capital. Technological progress is introduced to explain why economies can grow beyond a steady state (Solow, 1956). However, the main criticism is that technological progress is exogenous to the model (Barro and Sala-i-Martin, 2004, p. 61ff).

In contrast, endogenous growth theories explicitly consider knowledge in terms of human capital. Lucas (1988) utilizes the ideas of Becker (1964) and integrates workers with different levels of skills into his model. Accordingly, human capital has two effects. On the one hand there are 'internal' effects on individual worker's productivity and on the other hand 'external' effects contributing to the productivity of all other production factors. Assuming social learning processes, his model allows for infinite growth of human capital accumulation which leads to the growth of the whole economy. Lucas acknowledges "...that human capital accumulation is a social activity, involving groups of people in a way that has no counterpart in the accumulation of physical capital" (Lucas, 1988, p. 19). He is also concerned with the geographical scope of the external effect of human capital. By referring to Jacobs (1969), he concludes that cities must be the decisive nucleus for external effect of human capital (Lucas, 1988).

Romer (1990) laborates a model of growth that also includes technological change endogenously. Technological change is embodied in so-called 'instructions' which can be used to transform raw material. Once created, these instructions can be used continuously with no additional costs. In contrast to Lucas (1988) and Jacobs (1969), external effects of human capital are not caused by chance, but by intentional decisions of agents to invest in research and development (R&D) based on market incentives. Private firms can capitalise on R&D through monopolistic gains. The model shows that different endowment with human capital can explain the varying levels of development between nations. The main policy-implication is to stimulate or subsidise investments in human capital in order to foster economic growth (Romer, 1990).

These models consider the effects of the concentration of human capital, however they do not explain regional variations in human capital accumulation in the first place. The question can be posed as to why differences of the spatial concentration of human capital and economic growth can be observed. One can identify two competing lines of argument in the literature. The traditional answer is that industrialization and the spatial concentration of sectors (e.g. clusters) are the drivers of regional economic growth and in consequence affect the geographical distribution of human capital. In contrast, an argument that is particularly discussed in recent years identifies the movement of people – and thus human capital – as the causal factor of economic growth. Overall, theses arguments lead to the question, whether 'people follow jobs' or 'jobs follow people' (Florida, 2002a; Storper and Scott, 2008; Carlino and Mills, 1987; Partridge and Rickman, 2003; Steinnes, 1982)

While there is already an extensive body of literature that theoretically and empirically analyses the causes and effects of the geographical concentration of human capital (Rauch, 1993; Glaeser et al., 1992; Simon and Nardinelli, 2002; Moretti, 2004), Florida (2002a) gained considerable attention by scientists as well as practitioner for his best-seller "The Rise of the Creative Class".

In his first articles Florida approximates human capital in the common fashion as people with a bachelor degree or above. He calls these people "talents". Furthermore, he claims that these talents are geographically highly mobile and they move because of certain preferences. He argues that talents tend to seek amenities-

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rich places that are characterised by an open and tolerant atmosphere. This in turn leads to a spatial concentration of human capital in regions with the above described qualities. Furthermore, the concentration of talents attracts companies from outside the region. These high-tech or knowledge-intensive companies need highly qualified employees as a critically important input. Moreover, a disproportionally large number of talents become entrepreneurs and starts their own technology or service company. Florida summarises these elements and causal chain of regional growth "Talents, Tolerance, Technology" or short the three "T's" (Florida, 2002a).

Later, Florida developed a new definition of talents: his so-called creative class. He argues that creativity is the most important skill to create innovations and it is more relevant than a high qualification per se. Thus he identifies occupations that need a high level of creativity in order to be executed. Following Florida, members of the creative class "...engage in complex problem solving that involves a great deal of independent judgement and requires high levels of education or human capital" (Florida, 2002a, p. 8). The creative class can be divided into three sub-groups. The first group is the super creative core which consists of professions such as scientists, engineers, university professors, artists, designer etc. They are "...producing new forms or designs that are readily transferable and widely useful..." (Florida, 2002a, p. 69). The second group is called creative professionals. They work in knowledge-intensive industries, financial services, legal services, health care, and business management. Creative professionals are creative since they solve specific problems in everyday business (Florida, 2002a). Finally, bohemians are often treated separately as they play a distinct role in Florida's considerations. They can be seen as an 'indicator species' that signals an attractive environment for other creative class members (Wojan et al., 2007b). At the same time they are part of a creative milieu and can provide cultural amenities that might appeal to professionals or other core members. However, bohemians differ from the rest of the creative class with respect to their socio-economic status. They work in arts as well as in cultural and creative industries. Their careers are often characterised by precarious and insecure working conditions with a high share of self-employment and lower wages compared to workers with similar qualifications (Comunian et al., 2010).

Florida's concept of the creative class has frequently been criticised. Particularly the very broad – or 'fuzzy' – definition of the creative class provoked criticism (Glaeser, 2005; Markusen, 2006; Peck, 2005; Scott, 2010; Storper and Scott, 2008). For instance, the definition of the creative class is criticised because the difference to the conventional human capital measure remains unclear. Empirically, Glaeser (2005) could not find any additional significance of the creative class measure compared to the share of highly qualified labour on a regional level for explaining regional growth rates. In addition, the classification of which occupation belongs to the creative class and which does not, appears arbitrary. Markusen (2006) argues that it is not clear why, for instance, drafting technicians are part of the creative class but tailors are not. Moreover, Florida's definition seems to be too broad, because it includes nearly 40% of the workforce in the U.S. Therefore, it is questionable which similarities regarding lifestyle and political attitude the members of the creative class share to justify the label of a 'class' (Markusen, 2006).

Moreover, the very broad definition of the creative class is common mainly in the US context. In the European context – and particularly in Germany – creative individuals are associated with the sector of cultural and creative industries (Mossig, 2011). The intersection of both approaches mainly applies to Florida's so-called bohemians (Comunian et al., 2010). Nevertheless, Florida's concept is often confused or applied directly without considering a specific national context.

Criticism of the three T's model is mostly related to the mobility of creative class members and the relocation of companies in search for labour. As Sternberg (2012) concludes, most existing empirical evidence points to the importance of job availability and private motives for moving. Moreover, the example of Silicon Valley illustrates that there were fast growing high-tech companies in the first place that could attract highly qualified labour from outside the region (Sternberg, 2012). It seems more plausible that people "...choose to locate on the basis of some sort of structured match between their talents and the forms of economic specialization and labor demand to be found in the places where they eventually settle."(Storper and Scott, 2008, p. 162).

The effects of a concentration of the creative class on regional economic development are discussed less controversially. There is a lively debate about positive

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correlations of the share of creative class and regional economic growth and there are theoretical arguments on why such a correlation could be qualified as a causality (Florida et al., 2008; Hansen, 2007; Marlet and Van Woerkens, 2007). However, heterogeneity exists within the creative class and effects differ between the sub-groups. Especially, highly qualified members seem to induce growth, whereas bohemians do not (Marrocu and Paci, 2012a,b; Möller and Tubadji, 2009). However, it is not only the mere concentration of creative individuals in a region that should cause growth. It more reasonable that there is an interdependency between human capital and matching industries on the regional level that leads to economic growth (Storper and Scott, 2008).

Despite the empirical and theoretical inadequacies of Florida's hypotheses, many municipalities try to implement policies inspired by his ideas (Malanga, 2004). These policies focus on a 'people climate' instead of a 'business climate' and aims at investments in soft location factors in order to induce cumulative and self-reinforcing regional growth. However, Pratt (2008) argues that this leads to competition between municipalities, but unlike companies under free market conditions, municipalities cannot quit the market.

Moreover, even if investments in soft location factors are successful in the short run, it is doubtful whether this is the case in the long run. If more and more municipalities adopt this strategy, it loses its uniqueness and authenticity to attract talents (Peck, 2005; Pratt, 2008).

In addition to conflicts between regions, there could be conflicts within a region. The immigration of creative class members into central neighbourhoods with socially mixed populations and attractive buildings could cause gentrification, where parts of the indigenous population are forced to move out of their neighbourhoods (Peck, 2005).

Summarising the debate, it becomes obvious that the many shortcomings of the creative class concept are related to the fuzzy definition and to the lack of empirical evidence showing if and why creative class members are highly mobile and which factors shape their mobility and the dynamics of spatial concentration. Most studies empirically operate at an aggregated geographical level and leave out important information on the individual level, e.g. migration motives.

Therefore, this dissertation concentrates on three major shortcomings in the

existing literature: (1) the definition of the creative class, (2) the spatial concentration and its dynamics, and (3) the inter-regional mobility. Moreover, there is still a lack of studies for Germany as a whole and of case studies for specific German regions. Then next section describes the structure of the dissertation and research gaps in more detail.

1.2 Structure, research gaps and contribution to the literature

This dissertation was prepared in the context of the research project "Creative Lower Saxony: regional distribution, spatial mobility, start-up potentials and economic relevance of creative people". The project was funded by the Ministry for Science and Culture of Lower Saxony from 2011 to 2015 (grant number 76202-17-5/10). The dissertation is cumulative and has three main chapters 2 - 4) which are based on scientific publications. Chapter 2 has been published in the Proceedings of the 17th Uddevalla Symposium 2014 and is now in a review process for a book chapter in "Geography of Growth – Innovation, Networks and Collaboration" to be published by Edward Elgar. Chapter 3 has been published in "European Planning Studies" and Chapter 4 in "Environment and Planning A". The chapters consist of extended versions of the original publications with more comprehensive theoretical and empirical sections. Thus the structure of each chapter is composed of a theoretical, methodological and empirical part. Moreover, each chapter includes an introduction and conclusion. Therefore, occasional repetitions – especially regarding the theoretical discussions – cannot be avoided.

The second chapter tackles the first major shortcoming: the definition of the creative class. It utilizes insights from psychology and the data of the German Socio-Economic Panel (SOEP) (Haisken-DeNew and Frick, 2005) to identify creative individuals directly based on their personality traits. Previous studies relied on occupation or industry-based definitions to identify creative individuals and aggregated regional numbers (e.g. share of creative class). Therefore, instead of observing the behaviour of creative individuals, there are occupation- or industry-specific characteristics in a region correlating with a concentration of those indi-

viduals (Storper and Scott, 2008). These results could be distorted due to ecological interference fallacy meaning that correlations on a higher level are not identical with the corresponding correlations on a lower level (Robinson, 1950).

Thus, Chapter 3 proposes an alternative definition of creative individuals ¹. The five-factor model – or big five model – is a well-recognized concept from psychology used to describe an individual's personality based on five basic dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. The dimension of openness identifies creative, innovative, and artistic performance and interests of an individual (McCrae and John, 1992). Thus, it should be a more direct method for identifying creative individuals instead of the approximation by occupations.

Furthermore, analyses rely on multi-level regressions and include individual and regional characteristics simultaneously into models which should reduce the risk of ecological fallacy. Hence, individual level variables that are closely related to corresponding regional level characteristics are considered. If significant correlations on both levels are observed, a causal relationship can be more confidential presumed (Hox, 2010).

Therefore, Chapter 3 proposes a more direct method for identifying creative individuals and analyses the characteristics of their regional environment. By applying multi-level regression analysis, hypotheses derived from the creative class literature are tested, comparing creative individuals defined by their personality to the rest of the workforce. The SOEP serves as a representative and reliable database for individuals in German regions. Thereby, this chapter contributes to the creative class literature using a new approach to identify creative individuals, a more advanced method and unique data.

The chapter focuses on the questions:

- Which regional characteristics known from the creative class literature shape the geography of creative individuals identified by the psychological approach?
- How do these results differ in comparison to the conventional creative class

¹ The alternative definition is only applied in this chapter. The other chapters base on different definitions.

definition?

There is only little statistical support for the relevance of the creative class hypotheses for creative individuals identified by the psychological approach. Only soft location factors reflecting openness and tolerance are positively and significantly correlated. Moreover, creative individuals defined by their personality seem most similar to Florida's bohemians.

However, supportive evidence is found for the conventional approach based on occupations. However, considerable heterogeneity exists within the creative class. Therefore, it seems reasonable that regional effects caused by the concentration of the creative class members are more likely explained by occupational or sectoral determinants and their interplay with the individual level variables such as human capital.

Due to the high heterogeneity of the results, even within the creative class, future research should limit analyses to specific occupations and/or industries. Moreover, recently politics in Germany increasingly aim at cultural and creative industries Sternberg (2012). Therefore, the following chapters concentrate on the sub-group of bohemians, which forms bridges between the creative class-focused debate in the US and the creative industries-centred view in Europe and Germany (Comunian et al., 2010).

Chapter 4, therefore, deals with the second major shortcoming: the spatial dynamics of agglomeration of the creative class. This chapter contributes to the on-going debate about the relative importance of soft and hard location factors for attracting members of the creative class. While Florida highlights the role of amenities, openness and tolerance, other authors emphasize the role of regional productions systems, local labour markets and externalities (Storper and Manville, 2006; Storper and Scott, 2008). This chapter sheds light on the issue by analysing the changes in the spatial distribution of four groups of artists over time: visual artists, performing artists, musicians and writers. The chapter's contribution to the creative class literature is that the chapter overcomes some of its shortcomings. First, in contrast to most existing studies, the dynamics of the spatial agglomeration are considered, which better identifies the diachronic nature of causal relations (Storper and Scott, 2008).

Secondly, it focuses on one sub-group of the creative class, namely artists. In addition, artists are further divided into four groups: visual artists, performing artists, musicians and writers. This allows for sounder theoretical discussions and empirical investigations of the spatial distribution and the spatial dynamics of creative people, avoiding the fuzzy definition of the creative class.

Thirdly, besides the factors put forward by Florida (e.g. amenities, openness and tolerance), a broad array of economic factors that are known to influence the mobility and growth of human capital is considered.

The chapter focuses on the following four questions:

- How are artists distributed across German regions?
- How does their distribution change over time?
- Which location factors are associated with the regional growth rates of freelance artists?
- To what extent can sub-groups of artists explain why their distribution, growth rates and other factors differ?

These questions are answered using quantile regressions and a unique dataset covering 412 German regions for the years 2007–2010. Following the conventional and static approach, the results concur with most of the findings on the relevance of amenity-related factors identified by other authors (e.g. Florida, 2002a; Florida et al., 2008; Clark et al., 2002; Glaeser et al., 2001). However, when dynamic – and thus more appropriate – models are applied, the results change substantially. It turns out that population growth, the level of consumption of high culture, the creative milieu, variations in crime rates and externalities account for the agglomeration of artists in a region. More precisely, population growth and localization externalities are identified as the two central determinants that influence the growth of regional artistic populations. Furthermore, most types of artists (except musicians) experience negative growth effects if they are over-proportionally present in a region. Moreover, the study identifies a considerable heterogeneity within the group of artists when it comes to the factors that explain their regional agglomeration over time.

This chapter looks at the net change of artists in a region.t delivers valuable insights into the overall agglomeration dynamics, but it cannot distinguish between factors that influence the endogenous growth of artists' population or that cause inter-regional migration. The use of quantitative data might not be appropriate to answer the question of which factors cause mobility. Qualitative methods could deliver valuable insights into individual behaviour, a topic which is complex and not easily available in quantitative datasets.

Thus, chapter 4 addresses the third major shortcoming: a lack of in-depth insights into the motives and decisions of inter-regional mobility of creative individuals. It presents the results from a case study in order to fill this gap. One of Florida's main assumptions, the high mobility of creative class members and their distinct location preferences, has so far gained very little attention in the literature. Most studies rely on concentration analyses and only few studies use real migration data (Hansen and Niedomysl, 2009). Moreover, the majority of studies is quantitative and deals with 'observed choices' of migrants rather than their intrinsic motivation for moving to a certain place. Moreover, quantitative data seldom gives information about reasons why people stay. Only a few studies apply qualitative research methods that address this problem and deliver in-depth insights into migration decisions (Andersen et al., 2010b; Bennett, 2010; Borén and Young, 2013; Martin-Brelot et al., 2010; Verdich, 2010). However, even these studies seldom have a dynamic perspective (except Borén and Young, 2013). Using an innovative research design – the life-history-calendar method (LHC) (Freedman et al., 1988) - in-depth interviews were conducted with individuals involved in the design and advertising industry from three different regions in Germany. The results of these interviews shed light on the inter-regional migration motives of the creative class. This chapter analyses a rich and unique dataset of spatial and career trajectories to address the questions:

- Why and to where do people from design and advertising move?
- How do migration motives and destinations change over a lifetime?

The stories of the interviewees are lively accounts on why not all creative people gravitate towards creative hubs such as Berlin and instead settle down in second-tier cities. The results show that people from design and advertising will likely move for different reasons throughout their careers. Social relations, qualifications and employment opportunities as well as self-employment turn out to be the main reasons for a decision to move or stay. There is little evidence that soft location factors as suggested by Florida, such as openness and tolerance, influence migration decisions and destinations. However, the reputation of a city as a 'media city' can influence young professionals to move to certain metropolitan regions.

The conclusion summarises the main findings of the three chapters and critically discusses the shortcomings as well as the contributions to the literature. Furthermore, it attempts to give policy recommendations on the basis of empirical evidence. Finally, suggestions for future research on the creative class are addressed.

Overall, the dissertation contributes to the literature by presenting new empirical methods and data. To the best knowledge of the author, there is no study on this subject so far which applies multi-level analysis methods. Moreover, chapter 3 considers growth rates instead of the common static approach which only looks at the share and thus delivers insights into agglomeration dynamics. Furthermore, by using qualitative data in chapter 4, in-depth knowledge about individual motives of migration or the decision to stay were derived. The fuzziness of the creative class definition is encountered by proposing an alternative definition and/or focusing on artists/bohemians which are the most creative group of the creative class.

Chapter 2

Creative class vs. individual creativity – A multi-level approach to the geography of creativity

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2.1 Introduction

For more than ten years, the topics of creative class, creative industries, and creative regions have been on the agenda of economic geography literature. The studies mainly focus on the distribution, mobility, and economic impact of creative individuals or companies from a regional perspective. Above all, it is the work of Florida that pays attention to creative individuals. His quantitative occupational approach is considered to be the prototype and dominant method and was adopted in a wide range of other studies (Florida, 2002a,a, 2005b; Florida et al., 2008; Florida and Mellander, 2010; Lee et al., 2004; Mellander et al., 2011). More recently, a growing body of literature is empirically testing Florida's hypotheses for regions outside the U.S. (Fritsch and Stützer, 2009, 2014; Boschma and Fritsch, 2009; Wedemeier, 2010, 2014; Möller and Tubadji, 2009; Clifton, 2008; Westlund and Calidoni, 2010; Marlet and Van Woerkens, 2007; Marrocu and Paci, 2012a,b; Mossig, 2011). However, the occupational approach raised criticism and remains fuzzy (Glaeser, 2005; Markusen, 2006; Peck, 2005; Pratt, 2008; Storper and Scott, 2008; Scott, 2010).

Previous studies empirically relied on occupation or industry-based definitions as a means to identify creative individuals and aggregate regional numbers (e.g. share of creative class). Thus, results can be potentially distorted. Instead of observing the behaviour of creative individuals, there are occupation or industryspecific characteristics in a region that might correlate with a concentration of creative individuals (Storper and Scott, 2008).

Following McCrae and John (1992) the five-factor model – or big five model – is a well-recognized concept from psychology to describe an individual's personality based on five basic dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. The dimension of openness describes the creative, innovative, and artistic performance and interests of an individual. Thus, it should be a more direct method to identify creative individuals than the approximation by occupations.

Therefore, the chapter analyses the characteristics of the regional environment of creative individuals defined by their personality. This chapter thereby focuses on the following questions:

- Which regional characteristics known from the creative class literature shape the geography of creative individuals identified by the psychological approach?
- How do these results differ in comparison to the conventional creative class definition?

Moreover, the multi-level approach allows including individual and regional characteristics simultaneously into regression models which should reduce the risk of ecological fallacy.

The dominant approach in creative class literature is to use aggregated data from the regional level to explain phenomena on the individual level. This could lead to ecological inference fallacy meaning that the correlations on a higher level are not identical with the corresponding correlations on a lower level (Robinson, 1950). By applying multi-level regression analysis, hypotheses derived from the creative class literature are tested comparing creative individuals with the rest of the workforce. The German Socio-Economic Panel (SOEP) serves as a representative and reliable database for individuals in German regions. Thereby, the chapter contributes to the creative class literature using a new approach to identify creative individuals, a more advanced method and unique data.

The chapter is structured as follows. First, the creative class concept and the five-factor model from social psychology are introduced. Next, empirical results from economic geography and literature on the geography of creativity are discussed. Then, the data, methods, and empirical models are explained. Section 4 draws conclusions on the research gaps and hypotheses. Section 5 deals with descriptive statistics and multi-level models to compare creative individuals and creative class members with the rest of the workforce. Moreover, results are discussed with regard to former empirical studies. Finally, results are summarised and further needs for research are addressed.

2.2 The creative class debate and the five-factor model

2.2.1 The creative class debate in economic geography

Traditionally, human capital was measured in the form of highly qualified labour (e.g. people with a bachelor's degree and higher). In contrast, Florida argues that it is not important what people have learned but rather, what they actually do. Therefore he developed an alternative definition of human capital based on occupations: the creative class (Florida, 2002a; Florida et al., 2008) . Members of the creative class "...add economic value through their creativity" (Florida, 2002a, p. 68). The creative class can be divided into two subgroups. The Super-Creative Core consists of professions, such as scientists, engineers, university professors, artists, designers, and the like. They are "...producing new forms or designs that are readily transferable and widely useful..."(Florida, 2002a, p. 69). The second group is called creative professionals. They work in knowledge-intensive industries, financial services, legal services, health care, and business management. Creative professionals are creative insofar as they solve specific problems in everyday business (Florida, 2002a).

Furthermore, Florida introduced the model of the three T's of regional economic growth. This model suggests a causal chain of tolerance, talents, and technology. The mechanism starts with an existing urban, amenity-rich, and tolerant climate. One indicator for such a local environment is a concentration of bohemians. These places attract core members and professionals. Technology comes into play as high-tech companies in search of talents relocate or start new businesses in these regions. Another source of technology is the creative class itself due to the high start-up rates of its members (Florida, 2002a; Florida et al., 2008).

Florida's concept and definition raised some criticism throughout the scientific community. The critics mainly focus on the vague definition and the causal relation of the three T's (Glaeser, 2005; Markusen, 2006; Peck, 2005; Pratt, 2008; Storper and Scott, 2008; Scott, 2010).

In one aspect, the definition of the creative class is criticised because the difference to conventional human capital remains unclear. Empirically, Glaeser (2005) could not find any other or additional explanatory relevance through the creative class definition compared to the share of highly qualified labour on the regional level for explaining regional growth rates. In another aspect, the classification of which occupation belongs to the creative class and which does not appears arbitrary. Markusen (2006) argues that it is not clear why, for instance, drafting technicians are part of the creative class but tailors are not. Furthermore, it is questionable which commonalties regarding lifestyle and political attitude the members of the creative class share to justify the label of 'class' (Markusen, 2006).

Moreover, members do not only differ with respect to their residential choice or voting preferences, but likewise in their socio-economic status. Bohemians especially are characterised by precarious and insecure working conditions with a high share of self-employment and lower wages compared to workers with similar qualifications Comunian et al. (2010).

The criticism of the model of three T's is mostly related to the mobility of creative class members and the relocation of companies in search for labour. As Sternberg (2012) concludes, most existing empirical evidence points to the importance of job availability and private motives as the reasons to move. Also, the example of Silicon Valley illustrates that fast growing high-tech companies that were there in the first place attracted highly qualified labour from outside the region (Sternberg, 2012). It seems more plausible that people "...choose to locate on the basis of some sort of structured match between their talents and the forms of economic specialization and labor demand to be found in the places where they eventually settle."(Storper and Scott, 2008, p. 162).

The effects of a concentration of creative class on regional economic development are discussed less controversially. However, it is not only the mere concentration of creative individuals in a region that should cause growth. It is more reasonable to assume that an interdependency between human capital and matching industries exists on the regional level that leads to growth (Storper and Scott, 2008).

Despite the empirical and theoretical inadequacies of Florida's hypotheses, many municipalities try to implement policies inspired by Florida's ideas (Malanga, 2004). These policies focus on 'people climate' instead of 'business climate' which aims at investments in soft location factors that should induce cumulative and self-reinforcing regional growth. However, Pratt (2008) argues that this leads to competition between municipalities, but unlike companies under free market conditions, municipalities cannot quit the market (Pratt, 2008).

Even if investments in soft location factors are successful in the short run, it is doubtful if this is the case in the long run. If many municipalities follow this strategy it loses its uniqueness and authenticity to attract talents (Peck, 2005).

In addition to conflicts between regions there could be conflicts within a region. The immigration of creative class members into central neighbourhoods with socially mixed population and attractive buildings could cause gentrification, where part of the indigenous population is forced to move out of their neighbourhoods (Peck, 2005).

Summarising the theoretical debate it becomes obvious that the many shortcomings of the creative class concept stem from the fuzzy definition and the disregard of the interplay of human capital and the industrial specialisation in a region.

2.2.2 The big five model of personality

The five-factor model – or big five model – as discussed, is a concept drawn from psychology to describe an individual's personality based on five basic dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (McCrae and John, 1992).

The big five model has its roots in two approaches: psycho-lexical studies and personality questionnaires. The former can be traced back to Allport and Odbert (1936). They used adjectives from dictionaries describing personality and formed 35 rating scales of distinct meaning. Their research was followed by intense and systematic work of Cattell (1943) who found 19 primary factors and 8 second-order factors. Later on, Fiske (1949) used Cattell's data, but only found five relevant and distinguishable factors. Tupes and Christal (1992) came to the same solution. They termed the following five factors: surgency, emotional stability, agreeableness, dependability, and culture. Norman (1963) further elaborated the concept of personality traits and derived the "Norman's Big Five" or simply "Big Five": extraversion, emotional stability, agreeableness, conscientiousness, and culture. During the 1960s and 1970s the interest in the psycho-lexical approach in mainstream personality research ceased. Interest was rekindled in the 1980s with reanalyses of earlier data and new empirical studies Digman (1989). Studies in different languages (e.g. Japanese, Chinese, and German) provided evidence for the universal structure of personality traits. Five dimensions were found in Chinese and German. The German study resulted in a nearly perfect replication of what was found in the English language study whereas the Chinese study showed some differences in the meaning of the five dimensions (Barrick and Mount, 1991; McCrae and John, 1992).

The second approach of personality questionnaires is rooted in personality theory and psychiatric nosology. This approach resulted in a vast number of different scales created by individual researchers to measure personality. Despite the diversity of these studies, Eysenck and Eysenck (1964) and Eysenck (1967) identified two recurring factors: neuroticism and extraversion. While the relevance of the two dimensions were confirmed by further research, it became obvious that they did not cover the whole scope of personality. Tellegen and Aktinson (1974) as well as Costa and Costa and McCrae (1976) found facts for a third dimension, namely openness to absorbing and self-altering experience or openness to experience. From that point on, the two approaches were combined to establish the current five-factor model (McCrae and John, 1992).

The history of the five-factor model shows that there were many rival – but often similar –approaches in psychology to describe personalities. The big five model helped to develop a common taxonomy. However, the interpretation of the meaning and content of the factors as well as the way they are studied still differs considerably. Thus, this study mainly relies on definitions from a standard textbook based on a meta-analysis of the field in psychology (John and Srivastava, 1999).

The big five model is hierarchical in its nature. All of the five factors can be understood as a superstructure comprising several traits of a lower level. The first factor extraversion (or energy, enthusiasm) covers traits such as sociability, activity, assertiveness, and positive emotionality. Agreeableness (or altruism, affection) represents altruism, tender-mindedness, trust, and modesty, which are prosocial traits. Conscientiousness (or control, constraint) signifies traits facilitating task and goal-orientated behaviour, like following norms and rules, planning, and prioritizing tasks. Negative emotionality is included in neuroticism (or negative affectivity, nervousness) and covers feeling anxious, nervous, sad, and tense. The last factor, openness to experience (or originality, open-mindedness) is related to the cognitive and experiential life of one's person and its differences in originality and complexity (John and Srivastava, 1999, p. 121).

This study is only interested in openness to experience. It is often related to creativity and originality but is different from the IQ score. It accounts for the individual's differences in creative, innovative, and artistic performance and interest (John and Srivastava, 1999). Thus, it should be a more direct means to identify creative individuals than the approximation by occupations.

A limitation of the five-factor model is that it was designed to describe individual personalities, but it was not intended to explain one's personality or the relations among the dimensions. Moreover, it is a static approach and does not capture dynamics. As the model is hierarchical in its nature, the big five are very broad and in some situations not specific enough. There are concepts of mid-level and low-level dimensions in psychology, but they are not as well-developed and empirically tested as the five-factor model (John and Srivastava, 1999). Recently, there are studies that are interested in the geographical variation of personality traits as well as the relation of personality traits and regional characteristics Rentfrow et al. (2008, 2013); Obschonka et al. (2013).

2.2.3 Empirical results on the geography of the creative class and creativity

Florida's own results are mostly based on aggregated data for U.S. metropolitan standard areas (MSA). In his first articles, he used the conventional definition of human capital (share of people with a bachelor's degree or higher). In 'The Economic Geography of Talent', he first laid out his idea of the three T's. He found statistical support for the attraction of human capital by diversity (share of same sex couple households) and amenities (share of bohemians), as well as an association of talents and the concentration of high-tech companies and high regional incomes (Florida, 2002a). He further explored the relationship to other regional factors. Results show that there is a relationship between diversity, creativity, hu-

man capital, and firm growth rates Lee et al. (2004). There is further evidence for different effects of creative class and conventional human capital measures on regional wage and income levels. The creative class is strongly associated with high regional wage levels and traditional human capital measures with high regional income levels (Florida et al., 2008).

While Florida focuses on metropolitan areas, Wojan et al. (2007b) and Wojan et al. (2007a) could show that the concentration of artists and creative professions in rural areas is related to natural amenities, population density, a young and educated population, as well as a strong creative milieu (Wojan et al., 2007b,a).

Recently, more and more studies are conducted on regions outside the U.S. Regarding Europe, Boschma and Fritsch (2009) used regional data for seven European countries. Their results reveal that creative class members are unevenly distributed across European regions and factors such as diversity and openness, as well as job opportunities, best predict this pattern. There is less evidence indicating that amenities play an important role in the European context. Effects of the creative class are mixed. In some countries, there are relationships between the regional concentration of the creative class with low unemployment rates and high patents and start-up rates (Boschma and Fritsch, 2009). These results are further supported by other studies on different European countries and specific groups of countries. For Nordic countries, there is support for soft locations factors and job growth, but these differ with respect to the city size. Thus, results mainly hold for big cities (Andersen et al., 2010b). In the United Kingdom, there is evidence for tolerance and openness affecting creative class concentration and concentration of creative class affecting regional growth (Clifton, 2008). A comparison of Sweden and the UK reveals differences between the different capitalist regimes. Employment growth in the UK is more associated with the concentration of the creative class compared to Swedish regions, while the opposite is true for population growth. Thus, this study highlights the context-dependency of the creative class hypothesis (Clifton et al., 2013). In Dutch regions, there is evidence for creative class concentration fostering employment growth and start-up rates (Marlet and Van Woerkens, 2007).

Fritsch and Stützer $(2009, 2014)^2$ show that the concentration of the creative

² Compared to Fritsch and Stützer (2009), Fritsch and Stützer (2014) use more recent data and a

class in Germany is related to urbanity, diversity (ethnic and cultural), public provision and health care supply, as well as regional growth (Fritsch and Stützer, 2009, 2014). Moreover, Möller and Tubadji (2009) prove that in German regions, the concentration of creative occupations is mostly related to sound economic conditions and not to amenities (Möller and Tubadji, 2009).

Mossig (2011) shows that regional growth rates of employment in creative industries mainly takes place in the main hubs for creative industries Berlin, Munich and Hamburg. Especially, rural and peripheral regions do not benefit from the general growth of this sector in Germany. These differences are primarily explained by location-specific advantages such as urban amenities and not the structural composition of the sector in regions (Mossig, 2011).

However, Wedemeier (2014)) comes to different results for Germany. He uses panel data for a study series of nearly 30 years. Initially, employment in the creative sector has a positive impact on total regional employment growth rates, but a negative one on employment in the same sector. Moreover, he finds support for the positive impact of urban amenities and knowledge externalities on creative sector employment (Wedemeier, 2014).

Alfken et al. (2015) focus on the regional growth rates of freelance artists in Germany to identify the dynamics of agglomeration and provide evidence for regional factors that shape the process of concentration of creative occupations. They show that particularly urbanity and the initial concentration of artists affects regional growth rates of artist population (Alfken et al., 2015).

In addition to the sensitivity of results in the regional context (e.g. urbanity and capitalist regime), the disaggregation of the creative class into narrow occupation groups, or according to specific industries, delivers different results. Florida et al. (2008) show that the effects of the spatial concentration of specific occupational groups vary. For instance, there are positive correlations between the concentration of technical and business occupations and regional wages but negative correlations between the concentration of education and healthcare occupation and regional wages (Florida et al., 2008).

By aggregating occupations according to knowledge bases Asheim and Hansen (2009) reveal that workers from different knowledge bases react differ-

refined definition of the creative class based on McGranahan and Wojan (2007).

ently to the business or people climate. Regional factors associated with people climate seem to attract workers mostly from the symbolic knowledge base and less from the synthetic knowledge base. The latter are more attracted by business climate (Asheim et al., 2007; Asheim and Hansen, 2009). Marrocu and Paci (2012a,b) try to empirically disentangle the effects of human capital acquired by education and creativity showing that "...highly educated people working in creative occupations are the most relevant component in explaining production efficiency, non-creative graduates exhibit a lower impact, and bohemians do not show a significant effect on regional performance." (Marrocu and Paci, 2012b, p. 369). Thus their research implies that the combination of creativity and education is crucial. However, their classification into creative graduates, non-creative graduates and bohemians is based on a strong assumption. They assume that bohemians' "...creative component, related to individual talent, is essential and predominant with respect to the educational one and thus we maintain that all bohemians are creative and did not graduate." (Marrocu and Paci, 2012b, p. 363). However, as will be shown later, bohemians in Germany are highly qualified. Therefore, a means to measure creativity that is independent from occupation or industry classifications and different from human capital is more appropriate to analyse the relationship of individual creativity and regional characteristics.

In his early work Florida adopted an occupational approach to identify creative individuals. In his 2008 book "*Who's Your City?*" he refers to insights from psychology to better describe creative people's differences in moving decisions and wealth creation (Florida, 2008). Therefore, he highlights the work of Rentfrow et al. (2008), who analysed the spatial distribution of people with specific psychological characteristics on a sub-national level.

According to Rentfrow et al. (2008), there is some research that addresses the differences of personalities across countries or nations. Yet, almost all of them are limited to the nation level or have even combined nations to regions of large geographic extent. Few empirical studies exist for the sub-national level and these are concentrated on U.S. States exclusively (Krug and Kulhavy, 1973; Plaut et al., 2002; Rentfrow et al., 2008, 2013). Therefore, the remainder of the following sections refer mainly to the studies of Rentfrow et al. (2008) and Rentfrow et al. (2013). Furthermore, the summary is restricted to results related to openness or

creativity.

Central results from recent studies on the geographical distribution of openness reveal clustered patterns on a sub-national level. Openness is significant and positively correlated with liberal values, such as attitude towards marijuana consumption, abortion, and homosexual marriage. Furthermore, there are positive correlations with the proportion of people working in artistic occupations or computer industries. Rentfrow et al. (2008) conclude that "...state-level O [openness] reflects, among other things, the extent to which individuals in a state are intellectual and creative" (Rentfrow et al., 2008, p. 360).

Elaborating their methodological approach, Rentfrow et al. (2013) identify states with distinct personality profiles. They ascertained three characteristic profiles that are regionally clustered: 'friendly and conventional', 'temperamental and uninhibited', as well as 'relaxed and creative regions'. The latter is of interest in regard to our own approach.

'Relaxed and creative' regions are ethnically more diverse, wealthier, have a higher educated population, show higher residential mobility, vote as democrats more often, and are more innovative compared to other regions. However, these regions exhibit lower levels of social capital and are associated with higher crime rates (Rentfrow et al., 2013, p. 1008f.).

A summary of the results from previous studies shows that empirical results differ with respect to the disaggregation of the creative class as well as to different regional contexts. However, and especially for Europe and Germany, urbanity, a creative milieu, economic prosperity, innovation, and entrepreneurial activities are associated with the spatial concentration of the creative class. Looking at regional creative personality profiles, some of these results are replicable, at least for the U.S.

2.3 Research gaps and hypotheses

The discussion of the theoretical debate of the creative class concept and the empirical results of this stream of literature has revealed relevant shortcomings and research gaps. For instance, the concept of the creative class lacks a theoretically based definition of membership. Therefore, the main aim of this chapter is to test hypotheses from the creative class literature with a newly derived definition of creative individuals. The new definition is based on a well-recognized concept from psychology which uses the factor of openness from the five-factor model as a direct method to identify creative people

The following hypotheses are derived from the creative class literature presented in Section 2 and relate to regional characteristics that are associated with the spatial concentration of creative individuals. Creative individuals are compared to the rest of the workforce to reveal distinct regional characteristics that are related to their environment.

Hypothesis 1: Creative individuals are associated with an urban, amenity-rich, and open environment. They are more likely to live in regions that ...

- a) exhibit a high share of bohemians,
- b) possess a high concentration of foreigners,
- c) are densely populated, and
- d) Reflect tolerance through a high rate of same-sex marriages.

Hypothesis 2: Creative individuals are associated with regional prosperity. They are more likely to live in regions that ...

- a) reveal a higher GDP per capita,
- b) show more entrepreneurial activity in form of self-employment or start-up rates, and
- c) have a higher number of patents per inhabitant.

Moreover, the multi-level perspective takes into account variables from different levels. Therefore, individual level variables that are closely related to corresponding regional level characteristics are also taken into account (see Table 2.1).

The multi-level structures shows possible causes and effects of the concentration of creative individuals in a region. For instance, if the presence of creative individuals is associated with a higher regional GDP per capita and also with higher incomes compared to the rest of the workforce, there is more evidence that creative individuals are the causal factor in comparison to the evidence provided by a correlation on the regional level, but without information on the individual level.

Moreover, if technological innovations on a regional level is caused by a concentration of creative indvidual. These individuals should have a high level of human capital (educational degree) and/or are working in an innovation-driven sector (high-tech, high KIS). The entrepreneurial activity in a region might also be influenced by creative individuals, so entrepreneurial activity is also expected on an individual level (being an entrepreneur or self-employed). Regarding factors that attract creative individuals, self-selection is possible. Rather than reflecting openness, tolerance and amenities, factors such as share a high share of foreigners, same-sex marriages, bohemians and population density might attract people because of a sorting process. These people migrate to places where people are more like themselves. For instance, foreigners choose regions with a high share of foreigners; gay or lesbian individuals may prefer regions with a high rate of same sex-marriages and people working in cultural industries choose a region with a high number of bohemians.

individual level	regional level
degree, high-tech, high KIS	patents per inhabitants
income	GDP per capita
solf omployed ontronyongun	share of self-employed, start-up
sen-employed, entrepreneur	rate
foreign-born	share of foreigners
same-sex relationship	share of same-sex marriages
	share of bohemians, population
culture	density

2.4 Data and methods

2.4.1 Data

The German Socio-Economic Panel (SOEP) has gathered representative microdata for Germany for 25 years covering social, economic, and behavioural scientific topics. Since 1984 in the Federal Republic of Germany, and since 1990 for the whole of Germany, the same people are surveyed on a yearly basis in regard to individual and household aspects. From time to time, questions are asked on special topics which are not included on a regular basis. In the years 2005 and 2009, information on personality traits in the form of the big five model were gathered (Haisken-DeNew and Frick, 2005; Schupp and Wagner, 2007).

The corresponding three questions for openness are shown in Table 2.2. These questions particularly relate to creativity and less to openness to experience. Answers were rated on a Likert scale from 1 to 7. As each scale is represented by three questions, the overall score is calculated as the sum of three scores. Since these scores range from 3 to 21, the scale was normalized to scores between 0 and 18 (Gerlitz and Schupp, 2005).

I see myself as someone who		
is original, comes up with new ideas		
values artistic experiences		
has an active imagination		
Source: SOEP (2012)		

Table 2.2: SOEP question

In addition to these traits, the variables of academic degree, income, nationality, same-sex partnership, and self-employment (solo or with employees) from the SOEP are used.

Most regional data is derived from the INKAR dataset from the year 2009. The share of bohemians in 2009 is derived from the data of the Social Security Insurance for Artists and Writers (Künstlersozialkasse, short: KSK). The variable patents per 100,000 inhabitants is calculated as the mean of EPO and PCT

patents between 2005 and 2010 based on the RegPat dataset from the OECD³. Regional start-up rates are obtained from the Institut für Mittelstandsforschung (IfM), which investigates SME-related research in Germany. The regional level comprises the 'Raumordnungsregionen' which represents German planning regions.

Sectoral dummies are high-tech manufacturing, high-tech knowledge-based services and cultural activities based on NACE (Nomenclature des statistiques des activités économiques de la Communauté européenne) codes⁴.

A detailed description of the variables is given in Table A.1.

Group	Sub-group	Ν
creative class		4,867
	bohemians	152
	core	1,664
	professionals	3,051
SOEP sample		10,176
	5%-quantile openness	789
	10%-quantile openness	1,353
	15%-quantile openness	2,035
	20%-quantile openness	2,861

Table 2.3: Groups and sample size

Source: SOEP (2012), own calculation

Only the current workforce (full and regular part time employed or selfemployed) is included in the sample. The definition of the creative class is based on the ISCO 88 classification and is adopted from Boschma and Fritsch (2009). The identification of creative individuals according to their score of openness is based on different quantiles. No threshold is given in the literature at which an individual is jugged as creative or not. Therefore, four different thresholds are

³ The data was kindly provided by Jérôme Stuck (Institute of Economic and Cultural Geography, Leibniz University of Hannover, Schneiderberg 50, 30167 Hanover, Germany, e-mail: stuck@wigeo.uni-hannover.de). For a detailed description see Maraut et al. (2008)

⁴ The definition is based on NACE 2-digit level (Rev 1.1): high technology manufacturing (30, 32, 33); high-tech, knowledge-intensive services (64, 72, 73); culture (92) (http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/DE/htec_esms.htm)
chosen: individuals that belong to the 5, 10, 15, and 20% of the sample with the highest values of openness. Table 2.3 shows the absolute number of sample size.

2.4.2 Multi-level logistic regression

The dominant approach in economic geography – and in creative class literature – is to use aggregated data at the regional level to explain phenomena on the individual level. This could lead to an ecological inference fallacy, meaning that correlations on a higher level are not identical with the corresponding correlations on a lower level (Robinson, 1950).

With respect to the creative class literature, there are possible inference problems regarding the effects of a concentration of creative individuals in a region and the cause of their presence. For example, there are findings that a high concentration of creative class members results in higher regional start-up rates (Lee et al., 2004). Using aggregated data, one cannot infer that higher start-up rates are caused by the establishment of creative individuals themselves.

Thus, by applying multi-level regression analysis, the risk of ecological fallacy is reduced. Multi-level regression analyses integrate micro and macro information into a single model. In social science, information is often available on the level of individuals and also on group level with information on the groups in which individuals are nested. A common assumption of regression analysis is that observations are independently and identically distributed, but this is not the case for nested data sets where the correlation of individuals of the same group could accrue (de Leeuw and Meijer, 2008).

The empirical models in this chapter are two level logistic regressions. Models are estimated as random intercept models. This implies that the average likelihood of the outcome can vary from region to region. A random slope or random intercept and slope model is not applied as there is no theoretical reason to assume that the relation of dependent and independent variables varies between regions (Hox, 2010).

The model equation is as follows:

$$Y_{ij} = \gamma_{00} + \gamma_{10} \bullet X_{ij} + \beta_{01} \bullet Z_j + u_j + e_{ij}$$

with:

$$\begin{aligned} Y_{\rm ij} &= \ln \left(\frac{P\left(Y_{\rm ij}=1\right)}{1-P\left(Y_{\rm ij}=1\right)} \right) \\ e_{\rm ij} ~\sim~ N(0,\sigma_e^2) \\ u_{\rm j} ~\sim~ N(0,\sigma_u^2) \end{aligned}$$

The dependent Y_{ij} denotes the likelihood ratio of being a creative individual, 1 individual is creative or 0 is not creative, depending on individual level predictors X_{ij} and Z_j on the regional level. The residual error terms are e_{ij} at the individual level and u_j at the regional level. They have a mean of zero and unknown variance of σ_e^2 and σ_u^2 (Hox, 2010).

All independent variables are grand mean centred and thus lead to better a convergence of the models. Moreover, the intercept is not a hypothetical value. If all independent variables are zero, it can be interpreted as the average likelihood of being a member of the creative class or a creative individual (Hox, 2010).

2.5 Multi-level analysis

2.5.1 Descriptive evidence

Looking at the distribution of openness within the creative class, Florida does not seem to be completely wrong with his approach. As suggests, on average, members of the creative class actually score higher than the rest of the workforce. Furthermore, there are considerable differences within the creative class. Bohemians score the highest on average, followed by members of the core and professionals (see Figure 2.1).



Figure 2.1: Distribution of openness and class membership

Source: SOEP (2012), own calculation

Comparing Florida's occupational approach with the psychological one, both definitions overlap (see Figure 2.2). In total, 9.5% of the creative class also fall under the definition of the top 5%-quantile. This proportion increases up to 33.4% for the top 20%. Looking at the different subgroups of the creative class there are considerable differences of intersections of both definitions. 33.6% (69,7%) of the bohemians are part of the top 5% (20%), whereas, the overlap accounts for only 10.1% (36,6%) for core members and 8.0% (29,8%) for professionals.



Figure 2.2: Overlap of definitions

Source: SOEP (2012), own calculation

In the following, the descriptive analyses of creative class members or creative individuals and variables on the individual and regional level are discussed. First, the individual level variables are presented.

A major criticism of Florida's approach is the conflation of creativity and human capital. It is argued that occupations that belong to the creative class require a high level of education (Florida, 2002a). Figure 2.3 reveals that indeed the creative class is highly qualified, but there are considerable differences between the sub-groups. 81.9% of the core members possess the highest degree, i.e. the university degree. Bohemians are the second largest group with 51.3%. The number is lower for professionals with 40.1%, but the proportion of graduates from applied universities with 11.8% is relative high. Regarding the psychological approach the proportion of individuals with a university is higher than professionals (39.2%). However, the rates do not differ substantial between the different quantiles. Furthermore, a Spearman rank-order correlation⁵ shows a significant relation of openness scores and educational degree, but the coefficient with 0.16

⁵ rho = 0.16, p-value < 0.001

is low. Thus, in the German case Florida's occupational approach is strongly associated with educational attainment, whereas openness is less related and seems to indicate a different dimension.



Figure 2.3: Educational attainment of individuals

Source: SOEP (2012), own calculation

Figure 2.4 depicts the proportion of individuals working in high-tech manufacturing and high-tech knowledge-intensive services as well as in the cultural sector. A large number of bohemians works in the cultural sector (42.8%). Only 3.9% work in high-tech knowledge-intensive services and none in high-tech manufacturing. Only knowledge-intensive industries play a role for core members with a proportion of 7.5%. High-tech manufacturing and the cultural sector both account for less than 1%. A proportion of 4.8% of the professionals works in knowledge-intensive services, 1.7% in high-tech manufacturing and 0.8% in the cultural sector. Concerning the psychological approach, the proportion of individuals working in the cultural sector decreases from 4.7% for the top 5%-quantile to 2.9% for the 20%-quantile. The rates for high-tech (0.7-1.3%) and knowledgeintensive industries (3.5-3.9%) remains relatively stable.



Figure 2.4: Share of sectors individuals are working in

Source: SOEP (2012), own calculation

One of Florida's assumptions – which was partly confirmed empirically on the regional level – is that creative class members are associated with regional entrepreneurial activities. Figure 2.5 reveals the level of entrepreneurial activity among creative class members and creative individuals according to their openness score. The label 'entrepreneur' denotes self-employed individuals with employees. The term 'self-employed' indicates that individuals are self-employed without employees. One limitation of this definition is that it is unclear whether the businesses owners are also the founders of the company.



Figure 2.5: Entrepreneurial activities of individuals

Source: SOEP (2012), own calculation

According to this definition bohemians have the highest share of selfemployed (30.9%). However, only 3.9% are entrepreneurs. Core members are less entrepreneurially active: 5.8% are entrepreneurs and 6.3% are selfemployed. Professionals possess a proportion of 9.1% entrepreneurs and 7.6% self-employed. For the alternative definition the proportion of entrepreneurs is relative stable over the quantiles ranging from 6.7% to 6.4%. In contrast, the proportion of self-employed individuals decreases from 11.1% for the 5%-quantile to 8.4% for the 20%-quantile. Regarding this result, the relation between entrepreneurial activities and creativity is indicated mainly for self-employed individuals. However, a Mann-Whitney-Wilcoxon Test⁶ shows a significant relation of openness for both the entrepreneur or self-employed individual.

⁶ Openness and entrepreneur: W = 2164300, p-value < 0.001

Openness and self-employed: W = 2028100, p-value < 0.001



Figure 2.6: Current net labour income [€] of individuals

Source: SOEP (2012), own calculation

Figure 2.6 shows the current net labour income per month for the different groups. The black dot is the group mean and the bars represent the 95% confidence interval. The red line represents the sample mean. According to Florida a concentration of creative class members leads to economic wealth and growth. If creative class members directly contribute to the regional economy, they should possess high incomes. Core members have the highest mean income with 2,495 \in per month. Significantly lower, but still relatively high is the mean income of professionals with 2,163 \in . Bohemians have a significantly lower mean income of 1,700 \in per month. The income of the different quantiles varies between 1,914 and 1,946 \in , however the difference is not statistically significant. Furthermore, a Spearman rank-order correlation⁷ shows a significant relation of openness scores and income, but the coefficient is very low with a value of 0.03.

⁷ rho = 0.03, p-value < 0.01



Figure 2.7: Share of foreign-born individuals

Source: SOEP (2012), own calculation

In the following, two variables are considered that might correlate with tolerance measures on the regional level. The proportion of foreign-born and individuals living in a same-sex relationship could potentially explain why there is evidence of correlations of regional concentration of creative class members. If the number of foreign-born or individuals in a same-sex relationship is higher within the creative class that could explain their preferences for such environments. The proportion of foreign-born is lower than the overall sample mean of 5.2% (see Figure 2.7). The lowest proportion can be found in case of core members, only 2.8% are foreign-born. The number for professionals is slightly higher (3.8%). Bohemians have the highest proportion within the creative class with 3.9%. Creative individuals have a proportion between 4.6% and 5.0%. Chi-Square Tests⁸ of the distribution of foreign-born within in a category and the rest of the workforce

⁸ Bohemians: X-squared = 0.26627, df = 1, p-value = 0.6058
Core members: X-squared = 23.328, df = 1, p-value < 0.001
Professionals: X-squared = 28.844, df = 1, p-value < 0.001
5%-q: X-squared = 0.17651, df = 1, p-value = 0.6744

show that only the lower proportions in case of professionals and core members are significantly different.



Figure 2.8: Share of individuals living in a same-sex relationship

Source: SOEP (2012), own calculation

The SOEP offers the opportunity to identify couples. By comparing the gender of couples the proportion of individuals in a same-sex relationship can be calculated (see Figure 2.8). However, this is only a rough proxy for estimating sexual orientation, because the SOEP does not directly address this issue. According to the data no bohemian individual lives in a same-sex relationship. This is most likely due to the fact that the sample size is of bohemians is very low and this aspect is not covered officially by the SOEP. Core members (0.84%) have the highest proportion followed by professionals (0.59%). Thus both groups are above the average of 0.42%. The proportion of the different quantiles ranges between 0.34% and 0.42%. The only significantly different value can be found for

^{10%-}q: X-squared = 0.1391, df = 1, p-value = 0.7092

^{15%-}q: X-squared = 1.5885, df = 1, p-value = 0.2075

^{20%-}q: X-squared = 0.17647, df = 1, p-value = 0.6744

core members by a Chi-Square Test⁹.



Figure 2.9: Share of bohemians in the region in 2009

Source: KSK (2011), own calculation

The last part of this section explores regional variables and starts with soft location factors. The standard repertoire of the empirical analyses in the creative class literature comprises four variables: the share of bohemians / artists, share of foreigners, share of homosexuals and urban density. The first three indicate a tolerant and open environment and the latter indicates urban externalities as stated by Jacobs (1969).

The share of bohemians in a region can be seen as an indicator for a creative

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<sup>9</sup> Bohemians: X-squared = 0.032138, df = 1, p-value = 0.8577
Core members: X-squared = 7.1442, df = 1, p-value < 0.01
Professionals: X-squared = 2.3618, df = 1, p-value = 0.1243
5%-q: X-squared = 1.554e-28, df = 1, p-value = 1
10%-q: X-squared = 0.0095639, df = 1, p-value = 0.922
15%-q: X-squared = 0.17636, df = 1, p-value = 0.6745
20%-q: X-squared = 4.1663e-30, df = 1, p-value = 1
```

milieu that is open to new ideas. The results clearly show that the score of all groups is above the sample mean (see Figure 2.9). In average the regional environment of bohemians reveals the highest share of bohemians with 3.2 bohemians per 10 thousand inhabitants. Next are core members (2.3) and professionals (2.1). The values of the quantiles slightly decrease from 2.2 to 2.1. However they do not differ significantly. The correlation of individual openness and the share of bohemians in a region is significant, but low with rho = 0.04^{10} .





Source: BBSR (2012a), own calculation

Tolerance towards minorities and different lifestyles is represented by the regional share of foreigners and the share of same-sex marriages in comparison to heterosexual marriages in a region (see Figure 2.10 and Figure 2.11). All groups have higher rates compared to the mean. However, only bohemians have significantly higher values than the other groups. Again, there are statically significant and positive correlations with these variables and individual creativity, but with

 10 S = 1.6815 \cdot 10¹¹, p-value < 0.001

low coefficients¹¹.



Figure 2.11: Share of same-sex marriages in the region in 2011

Source: BBSR (2012a), own calculation

The same applies for population density (see Figure 2.12). All groups score higher than the mean and bohemians are significantly higher than the rest. The correlation of creativity and population density is significant and positive but low¹².

¹¹ Openness and share of foreigners: $S = 1.6701 \cdot 10^{11}$, p-value < 0.001, rho = 0.05

Openness and share of same sex marriages: $S = 1.6446 \cdot 10^{11}$, p-value < 0.001, rho = 0.06 ¹² S = 1.6621 \cdot 10^{11}, p-value < 0.001, rho = 0.05



Figure 2.12: Population density in the region in 2009

Source: BBSR (2012a), own calculation

While the variables described above are mainly used in literature to explain the concentration of the creative class, the following part looks at the characteristics that are associated with regional development. A common indicator for regional economic prosperity and/or performance is GDP per capita. Figure 2.13 shows the mean GDP per capita in ten thousand Euros per inhabitant. Most groups are slightly above the mean. Moreover, bohemians have the highest value of 31.350 \in . This is peculiar since their mean income is the lowest. This is a first indication that bohemians might not cause regional economic growth in the first place, but might lead to favourable conditions like higher demand for cultural products in these regions. Moreover, there is no statistically significant correlation of individual creativity and regional GDP per capita¹³.

 $\overline{^{13}}$ S = 1.7332·10¹¹, p-value = 0.1858, rho = 0.01



Figure 2.13: GDP per capita in the region in 2009

Source: BBSR (2012a), own calculation

A popular indicator for innovations is patents per inhabitants¹⁴ (see Figure 2.14). It should reflect the creation of new ideas and products in a region. Except the professional group, all other groups cross the sample mean with their 95% interval showing that there is no significantly different group mean. The correlation of individual creativity and patents per inhabitants in a region is insignificant¹⁵.

¹⁴ Patents are widely used as an indicator for innovations, however there are some limitations of this measure, for instance it only accounts for technological innovations (see Smith, 2005, for a detailed discussion)

¹⁵ S = $1.7602 \cdot 10^{11}$, p-value = 0.8185, rho = -0.002



Figure 2.14: Patents per inhabitant in the region (mean of 2005-2010)

Source: OECD RegPat 2005-2010, own calculation

The last dimension of regional economic development to be considered is entrepreneurship. According to Florida (2002a), creative class members are themselves above-average entrepreneurial and thus should stimulate regional entrepreneurship activities. Figure 2.15 shows the share of self-employed individuals and Figure 2.16 start-up rates¹⁶. There seem to be no statistical differences between sample mean and group means for both variables. Furthermore, correlations of the share of self-employed and individual creativity as well as start-up rates are significantly negative but equal nearly zero¹⁷.

¹⁶ The analysis uses the so-called NUI indicator of the IfM. NUI denotes 'Neue unternehmerische Initiative' which means new entrepreneurial initiative. It comprises the foundation of new companies, new establishments of existing companies, self-employment as an secondary activity as well as the relocations and acquisitions of establishments in a region. Therefore, the indicator might exaggerate actual regional entrepreneurship activities IfM (2011).

¹⁷ Openness and share of self-employed: $S = 1.7952 \cdot 10^{11}$, p-value < 0.05, rho = -0.02

Openness and start-up rates: $S = 1.7976 \cdot 10^{11}$, p-value < 0.05, rho = -0.02



Figure 2.15: Share of self-employed in the region 2009

Source: BBSR (2012a), own calculation

Figure 2.16: Start-up rate in the region in 2009



Source: IfM (2011), own calculation

2.5.2 Multi-level regression models

The multi-level analysis compares creative individuals with the rest of the workforce with respect to the hypotheses derived from creative class literature. In addition, the same models are estimated for Florida's occupational approach to unravel the impact of definitions. The data has a two-level hierarchical structure with 10,176 individuals nested in 96 planning regions.

creative class	5.0 %
core	6.7 %
professionals	3.8 %
bohemians	22.1 %
creative individuals	
5%-quantile openness	4.6 %
10%-quantile openness	3.6 %
15%-quantile openness	2.6%
20%-quantile openness	2.2%

Table 2.4: Variance partition coefficient

SOEP own calculation

The first step is to fit the null model, which only comprises the intercept and level effects. To estimate the effects of a level, it is common to calculate the variance partition coefficient. In cases of logistic regressions, there are alternative approaches. In this case the 'latent variable approach' described by Browne et al. (2005) is applied. Considering the null models, the effect of the regional level varies from 2.2 - 22.1 % of total variance (see Table 2.4). Thus, 2.2 - 22.1 % of the variance of the dependent variable can be accounted for by which region each individual lives in. The regional level is most important for bohemians, less for core and least for professionals. In case of the traits approach the influence of the regional level decreases with the height of the quantile. In general, the explanatory power of the regional level is not very high.

Figure 2.17 and Figure 2.18 depict the random intercepts of the null models

of the top 5%-quantile of openness and the overall creative class model. It shows that the probability belonging to one of the groups varies considerably by region. The odds ratios of the intercepts express the mean chance to belong to one of the groups for every region. Thus values above one indicate a higher and under one a lower probability. For instance the chance to belong to the top 5%-quantile is 1.5 times higher, if one lives in Bonn. The confidence intervals reveal that odds ratios between regions for the 5%-quantile model are not statistically significant different from one. However, the creative class model fits better. Moreover, the regions with the highest odds ratios in the creative class model seem plausible from what is known from other studies. Berlin, Hamburg, Munich and Cologne are well-known creative hubs in Germany (Alfken et al., 2015; Fritsch and Stützer, 2009, 2014; Mossig, 2011). In contrast, the 5%-quantile model does not yield an obvious spatial pattern. In fact, Berlin ranks at the bottom with a lower probability belonging to the top 5%-quantile. Figure 18 in the Appendix shows the random intercepts for the other quantiles and the sub-groups of the creative class. The rankings for each approach appear consistent.

Figure 2.17: Random intercepts for top 5%-quantile openness (odds ratios with confidence intervals)



Figure 2.18: Random intercepts for creative class members (odds ratios with confidence intervals)



SOEP own calculation

Table 2.5 and Table 2.6 show the empirical evidence for creative individuals, the creative class, and its subgroups. Separate regressions were conducted with the independent variables shares of foreigners, same-sex marriages and population density, because of multicollinearity issues (see Table A.3 - A.8 in the Appendix).

Creative individuals are better educated, are more often entrepreneurs or selfemployed, and tend to work more frequently in the cultural sector than the rest of the workforce. Significant variables on the regional level are the rate of the selfemployed, bohemians, foreigners, same-sex marriages, and population density. Unexpectedly, the variable for self-employed individuals is negative.

The model for the whole creative class shows that members are better educated, earn more, are less likely to be foreign-born, live in a same-sex relationship more frequently, and are more often self-employed or entrepreneurs. Creative class members are clearly associated with high-tech knowledge-intensive services and the cultural sector. In some models, GDP per capita and patents per inhabitants are significant and positive. Furthermore, there are significantly positive correlations with all soft location factors.

The analyses of the subgroups of the creative class reveal differences in the significance and direction of the influence of variables. In contrast to the overall model, core members differ on the individual level as they are negatively associated with the entrepreneur dummy and the self-employed dummy is insignificant. Moreover, there are no significant effects through regional variables. With regard to the sector, they work more often in high-tech knowledge-intensive services and less in high-tech manufacturing and the cultural sector. The models for professionals are similar to the overall model, but the variable 'culture' is significantly negative. Moreover, they work significantly more often in high-tech manufacturing. The dummy variable same-sex relationship is insignificant. Significantly positive correlations for the variables share of foreigners and same sex marriages as well as population density exist. Moreover, patents per inhabitants are significantly positive in all models. Bohemians are better educated and more often self-employed, but earn less. As expected, they work more frequently in the cultural sector. From a regional perspective, bohemians tend to live in urban regions, with a strong creative milieu and tolerance towards homosexuals and foreigners.

A summary of these results show that creative individuals - when defined by

	creative class	core members	profess- ionals	bohem- ians
Intercept	-0.534***	-2.59***	-1.151***	-5.005***
	(0.586)	(0.075)	(0.316)	(0.007)
degree	0.905***	1.567***	0.113***	0.371***
	(2.472)	(4.79)	(1.119)	(1.449)
income	0.704***	0.143***	0.271***	-0.186
	(2.023)	(1.154)	(1.311)	(0.83)
foreign-born	-0.653***	-0.423**	-0.554***	-0.699
	(0.521)	(0.655)	(0.575)	(0.497)
same-sex relationship	1.009**	0.986**	0.39	
	(2.742)	(2.68)	(1.477)	-
self-employed	1.021***	-0.188	0.682***	1.512***
	(2.775)	(0.829)	(1.978)	(4.538)
entrepreneur	0.637***	-0.601***	0.823***	-0.142
	(1.892)	(0.548)	(2.277)	(0.868)
high-tech	0.02	-1.333***	0.615***	
	(1.02)	(0.264)	(1.849)	-
high KIS	0.806***	0.579***	0.218**	0.298
	(2.239)	(1.784)	(1.243)	(1.347)
culture	0.817***	-1.294***	-0.951***	4.186***
	(2.263)	(0.274)	(0.386)	(65.778)
share of bohemians	0.122***	0.042	0.043	0.376***
	(1.13)	(1.043)	(1.044)	(1.456)
GDP per capita	0.393*	0.192	0.201	-0.261
	(1.481)	(1.212)	(1.222)	(0.77)
start-ups	-0.042	-0.042	-0.03	0.156
	(0.959)	(0.959)	(0.970)	(1.169)
share of self-employed	-0.034	-0.021	-0.032	-0.118
	(0.966)	(0.979)	(0.968)	(0.889)
	0.075*	0.014	0.08***	0.125
patents per inhabitants	(1.077)	(1.014)	(1.083)	(1.133)

Table 2.5: Multi-level regressions: Creative class models

odss in parentheses, * p <0.1, ** p <0.05, *** p <0.01 Source: SOEP (2012), own calculation

	5%- quantile openness	10%- quantile openness	15%- quantile openness	20%- quantile openness
Intercept	-2.552***	-2.009***	-1.891***	-1.227***
	(0.078)	(0.134)	(0.151)	(0.293)
degree	0.203***	0.216***	0.267***	0.256***
	(1.224)	(1.241)	(1.306)	(1.291)
income	0.024	-0.008	-0.015	0.016
	(1.024)	(0.992)	(0.985)	(1.016)
foreign-born	-0.074	-0.031	-0.088	0.029
	(0.929)	(0.97)	(0.915)	(1.029)
same-sex relationship	-0.267	-0.346	-0.445	-0.201
	(0.766)	(0.707)	(0.641)	(0.818)
self-employed	0.751***	0.685***	0.682***	0.642***
	(2.118)	(1.984)	(1.979)	(1.901)
entrepreneur	0.268*	0.428***	0.35***	0.268***
	(1.307)	(1.534)	(1.42)	(1.308)
high-tech	-0.409	-0.084	-0.058	0.193
	(0.664)	(0.919)	(0.944)	(1.213)
high KIS	-0.175	-0.104	-0.058	-0.098
	(0.839)	(0.901)	(0.944)	(0.907)
culture	1.205***	1.183***	1.114***	1.103***
	(3.338)	(3.265)	(3.045)	(3.015)
share of bohemians	0.107	0.129**	0.043	0.052
	(1.113)	(1.137)	(1.044)	(1.053)
GDP per capita	-0.144	-0.078	0.388	0.175
	(0.866)	(0.925)	(1.474)	(1.191)
start uns	-0.016	0.005	-0.054	-0.053
start-ups	(0.984)	(1.006)	(0.947)	(0.948)
share of self-employed	-0.169***	-0.143***	-0.06	-0.077**
	(0.844)	(0.867)	(0.942)	(0.926)
patents per inhabitants	0.082	0.056	0(1)	0.009
	(1.085)	(1.058)		(1.009)

Table 2.6: Multi-level regressions: Creative individuals models

odss in parentheses, * p <0.1, ** p <0.05, *** p <0.01 Source: SOEP (2012), own calculation their personality - differ mostly with respect to the personal attributes. Looking at the regional level, measures of tolerance, urbanity, and amenities seem to be relevant. And, there is an odd, negative association with the share of self-employed at the regional level.

The members of the creative class are marked by heterogeneity – especially on the individual level. However, again soft location factors characterise the regional environment of professionals and bohemians. In addition, professionals seem to induce regional innovation activities. Core members are not associated with regional variables. In the next section, the results are discussed in light of the above described empirical studies.

2.5.3 Discussion of results

Analyses are static in nature which implies that an assertion about the direction of causality is difficult. For instance, the presence of creative individuals can lead to regional economic prosperity (jobs, demand, and entrepreneurial environment) or the economic opportunities can cause the presence of creative individuals (immigration or inertia). GDP per capita is only significant in the overall creative class models. Moreover, creative class members earn more than the rest of the workforce. However, creativity per se is not associated with prosperity, neither on the individual nor the regional level. Furthermore, the relationship to regional innovations is only significant for some overall and all professional models. At the same time professionals are associated with high-tech manufacturing. This confirms the results of Florida et al. (2008) revealing that different occupational groups have very different impacts on technology and regional prosperity. This is supported by findings showing that bohemians do not influence regional productivity; only highly educated people in creative occupations do (Marrocu and Paci, 2012a). Thus our findings again support the fact that there are more occupational and industry-specific effects in conjunction with human capital that cause regional development than creativity per se.

Other studies reveal that regional entrepreneurial activities are driven by a concentration of creative class members (Boschma and Fritsch, 2009; Lee et al., 2004; Marlet and Van Woerkens, 2007). This is not true for our own results.

On the contrary, creative individuals are negatively associated with the rate of self-employed on the regional level. However, they are themselves more likely to be self-employed. Similarly, bohemians are more often self-employed, but on the regional level the coefficient is negative, but insignificant. Furthermore, both groups work more frequently in the cultural sector. This hints at a rivalry among the self-employed. Especially, freelance artists seem to compete for local demand This result is also supported by studies from Alfken et al. (2015) and Hracs et al. (2011).

The degree of urbanity exerts influence in most models, and the coefficient is highest for bohemians. From a theoretical point of view, Jacobs externalities might be relevant in this respect. Due to the presence and density of a diverse set of people and industries in urban regions, individuals and companies are exposed to various sources of inspiration that foster their own creativity (Jacobs, 1969). Drake (2003) argues that the urban environment itself exerts influence on the creativity of artists. There are three mechanisms that foster the creativity of artists in an urban environment. First, the urban environment can act as a visual stimulus. Second, local social and cultural events can be a source of inspiration. Third, the local image functions as a brand, thus influencing the style of artists (Drake, 2003). Creative products are symbolic and aesthetic in their nature, and the image of a location could be part of the product. This means that some of these symbolic or aesthetic products refer to the meaning that is related to the urban environment or local traditions of production and services, like Hollywood's film industry, fashion in Paris and publishing in London (Scott, 2001).

The share of bohemians in a region is only significant in overall creative class, bohemian and top 10% quantile models. Again the highest coefficients can be found in models for bohemians. An explanation could be the high proportion of self-employed in cultural and creative occupations and the blurring of work and leisure time, which is especially pronounced for artists (Eikhof and Haunschild, 2006). Thus, artists might be disproportionally influenced by the availability of cultural activities and the interaction with peers. They can directly transfer these stimuli to create and improve their products and services. Moreover, it indicates the level of regional demand for cultural and artistic products.

Another explanation is the evolutionary view of Rentfrow et al. (2008). Cre-

ative individuals decide themselves to migrate to creative environments or they shape the creativity of their peers. So that, in one respect, more and more creative people migrate over time to regions with a high number of bohemians – while less creative individuals might migrate to other places – and less creative people in these regions might become more creative over time due to the presence of other highly creative people. The high number of bohemians could be the expression of an above average level of creativity among the population who work in creative occupations and/or consume cultural and artistic products (Rentfrow et al., 2008).

The share of foreigners and same sex marriages are positively significant in all models, except for the core regression models. Furthermore, on the individual level creative class members and creative individuals are less likely or not more likely to be foreign-born. The same is true for living in a same-sex relationship (except in overall and core models). Therefore, the effect should not be caused by self-selection. These results can be interpreted as proof of one of Florida's hypotheses. He argues that the gay and melting-pot index signals an environment of"…low barriers to entry for human capital…" (Florida, 2002c, p. 743). They are indicators for openness to diversity, innovation and creativity. Creative class members are attracted by such an environment. Members work in high-tech industries or establish new high-tech companies (Florida, 2002b). Looking at the results for professionals, this hypothesis seems partially true. Professionals live in tolerant places with higher patent rates and are themselves highly entrepreneurial. However, these regions are not characterised by higher entrepreneurial activities.

Looking at the effects of creativity on their regional environment, it becomes apparent that only professionals contribute to regional prosperity. Thus, it can be assumed that occupation-specific effects and human capital are more relevant than individual creativity per se.

2.6 Conclusion

More than ten years after "The Rise of the Creative Class", there is still an ongoing debate in the scientific community. One of the main problems of the creative class debate is the vagueness of the definition and its overlap with the conventional human capital measures. As Glaeser (2005) has shown for the regional level, the

creative class does not have more predictive power than educational attainment in explaining regional growth rates. This chapter gets to the root of Florida's concept by applying a concept from psychology – the big five – which directly describes the creativity of individuals. Thus, it avoids conflations with human capital and is more explicit in defining the creativity of individuals than occupational or industry definitions.

Another lack is methodical in nature. Most approaches in creative class literature use aggregated data to explain causality on the individual level. To overcome this problem of potential ecological inference fallacy, a multi-level regression approach was adopted.

The guiding questions were: Which regional characteristics known from creative class literature shape the geography of creative individuals identified by their personality? How do these results differ in comparison to the conventional creative class definition? To answer these questions, hypotheses from creative class literature were derived and multi-level logistic regressions were applied. Creative individuals and creative class members were compared to the rest of the workforce.

A summary of these results show that there is only little statistical support for the relevance of the creative class hypotheses for creative individuals. Only soft location factors reflecting openness and tolerance are positive and significantly correlated. However, supportive evidence is partly found for the conventional approach based on occupations. Professionals seem are associated with regional prosperity in terms of patents per inhabitants. Moreover, some overall creative class models show correlations with GDP per capita. There are no direct positive correlations with regional entrepreneurial activities. Contrarily, there is a negative relation for the alternative definition and for bohemians – both disproportionally engaged in the cultural sector and more often self-employed – indicating that freelance artists are particularly affected by local demand conditions.

Looking at our results, there is evidence for the first hypothesis (H1 a-d). Creative individuals, the overall creative, professionals and bohemians are associated with an urban, amenity-rich, and open environment. However, there is only little evidence for the second hypothesis (H2 a-c) that creative individuals are associated with regional prosperity. Only some of the overall creative class models show significant and positive correlations with the GDP per capita (H2 a). Additionally, professionals live more likely in regions with a high numbers of patents per inhabitants (H2 c). For H2 b a diametrically opposite effect was found. The share of self-employed individuals is significantly lower for models with the new definition.

Overall, results reveal a complex interplay of individual creativity, human capital, entrepreneurial activities, and the occupational as well as regional context. However, due to the static nature of the analyses, the direction of causality remains unclear. Creative individuals are unevenly distributed across occupations and indeed, Florida's creative class is more creative than the rest of the workforce. Individual characteristics like human capital and entrepreneurial activities are catalysed by the occupational context. While bohemians are the most creative members of the creative class, they earn less than the rest of the workforce. On the contrary, professionals and core members can capitalise on their creativity in terms of personal income. Moreover, professionals seem to contribute to regional prosperity via innovation activities. Concerning the alternative definition, creative individuals defined by their personality are most similar to bohemians.

There is still need for further research in order to arrive at a clearer picture of these relationships and the direction of causality. Furthermore, the empirical approach of this chapter has some shortcomings. The data set covers 10,176 individuals nested in 96 planning regions, thus on average, there are only about 100 individuals per region. Moreover, the analyses are static in nature and cannot portray dynamics, which are relevant when exploring agglomeration effects and the causality of regional economic effects. Are these creative individuals attracted by soft location factors or are they part of a tolerant and creative environment?

One way to further explore the relationship of creativity and geography could be to collect better-quality data on personality traits with larger sample sizes. As this data is more or less unavailable today, occupational approaches to creativity seem, at the moment, unavoidable. Thus, to establish causality, multi-level and dynamic approaches seem fruitful for the near future. Due to high heterogeneity of results, even within the creative class, it seems feasible for further research to limit future analyses to specific occupations and/or industries.

Another promising empirical approach is qualitative research. It directly pro-

vide deep insights into decisions and motives of individuals (Yin, 2009). First, empirical evidence from qualitative research on the creative class shows that hard location factors, such as job opportunities, the housing market, and public provisions, are more important than soft location factor, such as amenities, diversity, and openness. Furthermore, results point to the importance of social ties to family and friends as being relevant for a location choice (Andersen et al., 2010a; Lawton et al., 2013).

Overall, the chapter has shown that the combination of the big five concept and theories from creative class literature is fruitful for gaining insights into the geography of creativity. The combination of economic geography and psychology is a possible future conjunction for both disciplines.

Chapter 3

Factors Explaining the Spatial Agglomeration of the Creative Class: Empirical Evidence for German Artists

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3.1 Introduction

There is an ongoing debate about the creative class, creative industries and creative regions. These notions are indivisibly connected to Richard Florida's work. Florida (and his followers) highlight amenities, openness and tolerance as the key factors behind the geographic mobility and regional agglomeration of creative people. The notion 'amenities' is ambiguously used in the literature and comprises the climatic, cultural, recreational as well as aesthetic aspects of a regional environment (Storper and Manville, 2006). The role of these aspects is of particular interest to us because recently they have been used to explain the increasing urban economic and population growth (Glaeser et al., 2001; Clark et al., 2002). This growth stimulated investments in amenities, which then became a fashionable policy tool that attracted talented and creative people. Florida's concept of the creative class is frequently criticized, however (Glaeser, 2005; Markusen, 2006; Peck, 2005; Pratt, 2008; Storper and Scott, 2008; Scott, 2010), and his very broad, one may even say 'fuzzy', definition of the creative class in particular has provoked criticism.

While there is considerable empirical evidence backing Florida's hypotheses, they primarily relate to US metropolitan areas (Florida, 2002a,b, 2005b; Florida et al., 2008; Florida and Mellander, 2010; Lee et al., 2004; Mellander et al., 2011). Some empirical studies focus on regions outside the US. For instance, Fritsch and Stützer (2009, 2014), Krätke (2010), Mossig (2011), Möller and Tubadji (2009) and Wedemeier (2010, 2014) investigated these issues in Germany.

In order to test Florida's hypotheses, most existing studies closely follow his approach for empirical assessment. However, this implies that the broadness of Florida's theory frequently blurs empirical findings (Marrocu and Paci, 2012a). In addition, in empirical investigations many studies apply static approaches and ignore the inherently dynamic nature of spatial agglomeration processes.

The present study aims at overcoming some of these shortcomings. First, in contrast to most existing studies the chapter focuses on one subgroup of the creative class, namely artists. Artists are part of Florida's creative core and belong to the bohemians which are the most creative members (Alfken, 2014). Moreover, creativity is the essential skill of an artist. If there are locations that are conducive

to creativity, artists should benefit the most. Furthermore, we consider freelance artist who should be most footloose and sensible to the mechanisms claimed by Florida (Wojan et al., 2007b).

In addition, artists are further divided into four groups: visual artists, performing artists, musicians and writers. This allows for sounder theoretical discussions and empirical investigations of the spatial distribution and the spatial dynamics of creative people, avoiding the fuzzy definition of the creative class.

Secondly, besides the factors put forward by Florida (e.g. amenities, openness and tolerance), a broad array of economic factors that are known to influence the mobility and growth of human capital is considered. In this sense, Florida's hypotheses are confronted with concepts emphasizing regional productions systems, local labour markets and externalities (Storper and Manville, 2006; Storper and Scott, 2008)¹⁸.

The chapter focuses on the following four questions:

- How are artists distributed across German regions?
- How does their distribution change over time?
- Which location factors are associated with the regional growth rates of freelance artists?
- To what extent can sub-groups of artists explain why their distribution, growth rates and other factors differ?

Questions are answered using quantile regressions and a unique dataset covering 412 German regions for the years 2007–2010.

Following the conventional and static approach, the results concur with most of the findings on the relevance of amenity-related factors identified by other authors. However, when dynamic – and thus more appropriate – models are applied, the results change substantially. It turns out that population growth, the level of consumption of high culture, the creative milieu, variations in crime rates and externalities account for the agglomeration of artists in regions. More precisely,

¹⁸ We distinguish between economic and amenity-related location factors. One can also find the distinction between soft and hard location factors in the literature (Martin-Brelot et al., 2010).

population growth and localization externalities are identified as the two central determinants that influence the growth of regional artistic populations. Furthermore, most types of artists (except musicians) experience negative growth effects if they are over-proportionally present in a region. Moreover, the study identifies considerable heterogeneity within the group of artists when it comes to the factors explaining their regional agglomeration over time.

The chapter is structured as follows: the next section outlines the theoretical background on the agglomeration of the creative class in geographic space. Section 3.4 introduces the data and the empirical approach. Section 3.5 introduces the empirical model. The results of static and dynamic models are presented and discussed in Section 3.6. Section 3.7 concludes the study.

3.2 Theoretical considerations

The debate about the creative class has received considerable attention in the Economic Geography literature. Florida (2002a) prominently argues that the agglomeration of the members of the creative class in a particular region can stimulate its economic development and prosperity. He puts forward the concept of the '3 Ts' to describe the relationship between tolerance, talents and technology. The starting point of the chain of arguments is an open and tolerant climate in urban and amenity-rich areas. This climate then attracts members of the creative class who are highly mobile and react to this stimulus by migrating. Subsequently, the resulting geographical agglomeration of members of the creative class draws high-tech-companies seeking human capital to the region, which in turn leads to higher start-up rates of technology-based companies (Florida, 2002a,b, 2005b,a; Florida et al., 2008).

Members of the creative class might even start a business themselves. As a result, a cumulative process of knowledge and technology-based growth is induced (Florida, 2002c). Consequently, researchers try to understand the reasons behind the variations in the agglomeration of members of the creative class across regions. Studies dealing with this issue can broadly be attributed to two different streams of literature. On the one hand, there are studies based on the ideas of Richard Florida. These particularly emphasize the role of certain amenity-related factors (Florida, 2002a; Clark et al., 2002; Glaeser et al., 2001). On the other hand, there are more traditional views which see the economic factors relating to the structure of the economy and population of a region as the primary driving force behind the agglomeration of the creative class (Storper and Manville, 2006; Storper and Scott, 2008). First, Florida's arguments are presented in more detail before coming back to this stream of literature. Some of the arguments relate to the creative class in general, while others are related to artists – the subject of empirical analyses – in particular.

3.2.1 Amenity-related and tolerance factors

Florida argues that members of the creative class prefer to live in regions that have a number of characteristics, which means these regions are more likely to experience an agglomeration of creative people over time. In particular, this includes an open and tolerant climate and amenities. In Florida's view, tolerance reflects "low barriers to entry for human capital" (Florida, 2002c, p. 743). A tolerant environment is open to new ideas and entrepreneurs, and this means that it attracts human capital in general, but especially creative people who need such an environment to constantly develop new and unconventional ideas. In addition, Florida claims that creative people have excentrical lifestyle and they may have faced discrimination themselves. They seek communities with people who share their values, or who are at least open-minded. These communities value or are open towards self-expression, sexual norms, gender roles and ecological awareness, which are related to characteristics of tolerant societies (Florida, 2002a). He argues that tolerance helps to attract human capital, accelerates spill-overs and human capital externalities and reflects an environment that is risk-oriented and associated with self-expression (Florida et al., 2008).

Other dimensions are the tolerance towards foreigners and social capital. Florida (2002a) reports a positive correlation between the concentrations of foreign-born population members and creative class members, but negative correlations with respect to the share of the non-white population. However, research by Putnam (2007) highlights that ethnic diversity does not necessarily indicate tolerance. In the short run, ethnic diversity even seems to foster intolerance and a decrease of trust, altruism and community cooperation. Societies benefit from social integration only in the long run. Navarro et al. (2014) confirms this by identifying a negative effect of the share of foreigners on the concentration of the creative class in Spanish municipals. This ambiguity suggests the existence of different types of social capital. For instance, Putnam (2000) differentiates between "bridging" and "bonding" social capital. Bonding social capital describes closed social groups, associations or networks. Individuals sharing similar characteristics form these groups. Such characteristics include gender, religion, sexual orientation, socioeconomic status, etc. In contrast, bridging social capital characterizes groups, associations or networks that link individuals who vary in these characteristics. Thus, bonding social capital scrutinizes the idea that social capital is always positive and facilitates externalities and spill-overs (Coffe and Geys, 2007; Geys and Murdoch, 2010).

Both types of social capital can be of particular importance for artists and conducive to a creative milieu. Artists heavily rely on (local) social interaction and trust, to exploit their creativity economically (Banks et al., 2000; Eikhof and Haunschild, 2006; Currid, 2010), making social capital an attractive regional characteristic.

Amenities matter in a similar fashion. 'Amenity' can mean many things, including good weather, a shoreline, ethnic diversity (or its absence), options for dining and entertainment, cultural programmes and aesthetically beautiful architecture" (Storper and Manville, 2006, p. 1252). Florida argues that these amenities have a crucial influence on the location decision of creative people. They desire self-fulfilment economically, but at the same time appreciate leisure (Florida, 2002a).

3.2.2 Economic factors

In contrast to these amenity-related factors, there are economic location factors that also influence the spatial distribution of the creative class and its dynamics. These have been highlighted in concepts of regional productions systems, local labour markets, and externalities(Storper and Manville, 2006; Storper and Scott, 2008).
The first and somewhat trivial reason for variations in the distribution of the creative class is the non-uniform distribution of the population. Naturally, highly populated cities are, all things being equal, home to more members of the creative class in absolute terms than smaller cities. What is more important is that the relationship between the population size and the presence of the creative class can induce different types of localization externalities. This may cause the spatial distribution of the creative class to differ from that of the general population. The most important effects in this respect are related to localization and/or Marshall externalities (Beaudry and Schiffauerova, 2009). These externalities may be subject to a critical mass effect, although if the absolute number of the creative class exceeds a certain threshold, positive localization externalities may unfold. One may think of potential knowledge spill-over, shared institutions, shared supplier and customer pools, and the benefits of local competition in this respect.

Related but not identical to this are localization externalities that are induced by the relative number of members of the creative class, meaning the relationship between the absolute number and a region's population is relevant¹⁹. Diametrical effects are possible in this case. On the one hand, a high relative agglomeration can foster knowledge spill-over effects, the awareness of creative communities and their political power (Currid, 2010). On the other hand, competition and rivalry for customers, suppliers and resources (e.g. public funding of arts) may intensify as a consequence of an increasing relative agglomeration (Hracs et al., 2011). Since some members of the creative class (e.g. artists) tend to be less prosperous in terms of resources they may be highly sensitive to increasing factor prices – e.g. affordable spaces for galleries – as a consequence of high relative agglomeration (Peck, 2005).

In addition to localization, the creative class may also be subject to urbanization and Jacobs externalities (Jacobs, 1969). For instance, a larger absolute number of the creative class may go hand in hand with a higher diversity. This in turn increases the creative potential of knowledge spill-over.

Another relevant demographic characteristic is the age structure of a region's population. For instance, Bader and Scharenberg (2010) highlight the view that

¹⁹ Following Brenner (2004), the relative number of members of the creative class in relation to the overall population is called "relative agglomeration".

younger populations are generally more open to new ideas and are potentially more interested in cultural and artistic activities. For this reason, a young population may offer a more attractive consumer structure for artists.

Another characteristic of the regional economic structure is the relevance of tourism. Tourism is associated with artists, who in general are known to attract tourists from outside the region (Currid, 2009). Many artists provide products and services which are consumed by tourists. These products and services can belong to high culture like opera, museums and ballet or to popular culture like musicals, festivals and street culture. Accordingly, the higher demand for these products by tourists makes a region more attractive for some artists. The same applies to the general economic situation in a region, as regional income may determine the demand for products and services by artists. However, artists seem to attach less importance to material aspects as they are more spatially mobile (Florida, 2002a; Wojan et al., 2007b; Menger, 1999).

3.3 Research gaps

Both literature streams provide good arguments for the influence of certain regional characteristics on the spatial distribution of the creative class. Therefore, factors put forward in both streams are considered. Given the existing empirical evidence on Florida's amenity-related factors, these are expected to be generally more relevant than the economic factors. This motivates the first hypothesis.

H1: Amenity-related location factors have a stronger relative importance for the spatial agglomeration of artists than traditional factors.

Section 2.2 highlights the idea that, from a theoretical point of view, localization externalities are either related to the absolute number of the creative class in a region or to their relative agglomeration. However, most studies model these externalities as being related to the agglomeration of general economic activities – e.g. population density – in a region²⁰. Accordingly, there is still little empirical evidence on the source of localization externalities in this context, though it is

²⁰ A potential reason for this might be the lack of longitudinal data, which is a requirement for such analyses.

suspected to be the most important factor among the economic factors. The next hypothesis addresses this issue:

H2: Localization externalities are the most important economic factor explaining the agglomeration of artists. These externalities emerge from the agglomeration of artists and not from the agglomeration of economic activity in a region.

When empirically testing the hypotheses, a number of weaknesses limiting many existing studies are sought to overcome. The most important one relates to the definition of the creative class. Florida puts forward the notion that members of the creative class "...engage in complex problem solving that involves a great deal of independent judgement and requires high levels of education or human capital" (Florida, 2002a, p. 8). In contrast to common approaches in human capital literature, his definition is not based on the educational attainment of individuals, but instead he refers to the occupation of individuals.

Therefore the definition is based on what people do instead of what they know. Moreover, Florida divides the creative class into two groups. Members of the 'creative core' belong to professions like scientists, engineers, university professors, artists, designers, etc. They are "... producing new forms or designs that are readily transferable and widely useful..."(Florida, 2002a, p. 69). The second group consists of workers in knowledge-intensive industries, financial services, legal services, health care and business management. This group is called 'creative professionals'. Their creativity shows in their ability to solve specific problems in everyday business (Florida, 2002a).

This straightforward conception is especially appealing to practitioners from economic or urban development agencies. However, it is subject to severe criticism within the scientific community. This criticism refers in particular to the 'fuzzy' definition of who belongs to the creative class.

For instance, Markusen (2006) argues that Florida conflates creativity with high levels of education. In addition, Glaeser (2005), using simple regression models, shows that a variable for education attainment outperforms the creative core variable in explaining regional economic growth.

Florida's definition of the creative class is also problematic from an occupational point of view. It includes occupational subgroups that are arguably creative like dental hygienists, but it does not consider marine engineers. Moreover, the creative class is very heterogeneous, making common spatial behaviours or similar economic effects unlikely.

Due to this heterogeneity, Markusen (2006)) even refuses to put creative individuals into a 'class' according to the sociological or political conception. "Corporate lawyers are conservative while trial lawyers are liberal; engineers tend to be moderate to conservative, and artists more liberal" (Markusen, 2006, p. 1924). Using Florida's definition of creative class consequently makes it difficult to "... disentangle which effects on local performances are due to their creativeness and which to their education" (Marrocu & Paci, 2012, p. 371).

The empirical investigation therefore focuses on just one particular subgroup of the creative class, namely artists. Artists are undoubtedly creative and members of Florida's creative class: "... the presence of a significant bohemian concentration signals a regional environment or milieu that reflects an underlying openness to innovation and creativity. This milieu is both open to and attractive to other talented and creative individuals." (Florida, 2002b, p. 56). Artists are part of Florida's creative core and belong to the bohemians which are the most creative members (Alfken, 2014). Moreover, creativity is the essential skill of an artist. If there are locations that are conducive to creativity, artists should benefit the most. Furthermore, we consider freelance artist who should be most footloose and sensible to the mechanisms claimed by Florida (Wojan et al., 2007b). One may even say that artists pioneer the preferences of the whole creative class, despite whatever definition is used (Lorenzen and Andersen, 2009).

Despite being a subgroup of the creative class, artists are still heterogeneous from an occupational point of view. They are subject to a variety of production and consumption schemes. For instance, visual artists and writers can easily transport their work over distances, whereas for musicians and performing artists – at least partly – co-location to their consumers (i.e. their audience) is a necessity. Writers and visual artists frequently work on their own. In contrast, performing artists and musicians usually need to cooperate with other people and form teams in order to become successful (Markusen, 2006). Such differences in production

and consumption schemes are likely to have severe implications for the spatial behaviour of artists. For instance, it seems plausible that visual artists and writers are most free in their location decisions, while musicians and performing artists are more likely to prefer to be close to other artists.

In summary, the approach follows Florida in that the creative class has a specific economic value that is primarily related to what they actually do and less related to its members' formal education. However, at least in the empirical analyses, it is essential to consider the specifics of the production and consumption schemes to which artists are subject. This is because these schemes define incentives and boundaries to the spatial behaviour of individuals. Artists are no exception in this respect. This motivates the third hypothesis of the chapter.

H3: Specifics of production and consumption schemes shape the spatial agglomeration processes of artists. In the case of artists, these schemes particularly alter the influence of localization externalities.

3.4 Empirical approach and data

3.4.1 Dependent variables

A lack of longitudinal data frequently obliges researchers to conduct crosssectional investigations, and these dominate the existing empirical research on the relative agglomeration of the creative class (Hansen, 2007; Clifton, 2008; Florida et al., 2008; Boschma and Fritsch, 2009; Fritsch and Stützer, 2009, 2014). However, agglomeration processes are dynamic in their very nature, so cross-sectional analysis delivers only limited insights into these processes. Thanks to the availability of panel data, analyses follow the few existing studies that apply a dynamic approach (Wenting, 2008; Wedemeier, 2010; Marrocu and Paci, 2012a,b).

Econometrically, models seek to identify regional factors correlating to the growth of regional artist populations. First the growth rate of an artist population in region 'r' on the basis of its relative annual growth 't' for each year between 2007 and 2010 is estimated:

$$Artists_{t,r} = \frac{Artists_{t,r} - Artists_{t-1,r}}{Artists_{t-1,r}}$$

In order to reduce the effect of stochastic noise in the growth rates, analyses focus on the (normalized) mean growth rate from 2007 to 2010.

$$Artists_r = \frac{\sum_{p=1}^{P} (Artists_{p,r} - Artists_p)}{P}$$

with p indicating the period (2007–2008, 2008–2009, 2009–2010), P the number of periods, and Δ Artistsp as average growth of artists in Germany.

Information on the annual growth of artists is derived from data of the Social Security Insurance for Artists and Writers (Künstlersozialkasse). This organization was introduced in West Germany in 1983 and the new federal states in 1992. Its purpose is to integrate freelance artists and writers into the social insurance system by contributing to the members' fees for compulsory statutory pension plans, health and long-term nursing care insurances. Members are visual and performing artists, musicians, journalists and people teaching in these fields. Their activities have to be profit-oriented and they have to be recognized as an artist/writer in their professional community (Künstlersozialkasse, 2011).

Freelance artists are a minority in the creative class in Germany. According to Fritsch and Stützer (2014) creative occupations only amount to 14.3% of the whole work force in 2007. Creative professionals account for 11.8%, the creative core for 2.2%, and employed bohemians, 0.2%. The share of freelance artists is even lower, with barely 0.2% (Fritsch and Stützer, 2014, pp. 214).

Following Fritsch and Stützer (2009, 2014)), German districts (Kreise) are used as units of observation. These regions represent the smallest spatial units for which such data is available. There were 412 of these administrative units in Germany in the year 2010.

For these 412 districts, the numbers of residing artists for each year between 2007 and 2010 are obtained. The numbers can be disaggregated into four branches: visual arts, performing arts, musicians and writers. The data covers only a share of all German artists and writers, as only self-employed artists are observed, leaving all artists in dependent employment unobserved. By looking at those freelancers, data on the (potentially) most mobile group of artists is considered because their geographic mobility is not constrained by job availability (Wojan et al., 2007).

Or, in the words of (Markusen, 2006, p. 1926): "High levels of selfemployment make plausible some of the claims made for creative class members – that they are more footloose and apt to choose a place to live before committing to employment or marketing efforts." Moreover, if these artists expand their businesses they are likely to hire other artists as dependent employees, and this makes them a pull factor for the mobility of other artists. Nevertheless, caution is needed when generalizing the findings to artists working in dependent employment.

3.4.2 Independent variables

For the 412 regions, the characteristics that explain the growth or decline in regional artist populations are identified. In the following section a number of regional characteristics are presented that are most likely to play a role in this context.

The first group of regional characteristics represents economic factors or variables which are central in traditional theories on spatial human capital accumulation and concentration. The first and probably most important factor in this respect is 'the absolute agglomeration of artists' (ART07) in the year 2007. It is an indicator of a critical mass of artists present in a region. As discussed in Section 2, such a critical mass is needed to unfold localization externalities which can stimulate the regional growth of the number of artists.

In contrast, localization externalities are related to the 'relative number of artists per inhabitant' (ARTPC07), or the spatial agglomeration of artists. These effects are not related to the absolute number of artists of a region, but are instead related to their relative importance in a local economy. The two factors approximating localization externalities are constructed from the same data as the dependent variable.

Most factors were constructed by means of a factor analysis (see Section 3.3). Factor YOUNG encompasses the "share of inhabitants between 18 and 25" and those from "share of inhabitants between 25 and 30" as well as "the number of students" (per 1000 inhabitants). The share of a young population and students indicates, at least in innovation-driven economies, a vibrant environment which is open to new ideas and has an interest in cultural and artistic activities, and therefore might be particularly important for artists (Bader and Scharenberg, 2010). Statistics about the number of students and the share of the young population was obtained from the INKAR data set, which is published by the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR, 2012a).

The factor MILIEU relates to an open and creative environment. Moreover, it represents the potential pool of people who start a career as a freelance artist. It is constructed from the number of graduates of artistic and culture disciplines per inhabitant and the share of same-sex marriages on all marriages (gay). The share of same sex marriages is based on census data. Data on graduates from cultural and artistic disciplines are obtained from the Federal Statics Bureau (Destatis, 2011).

The factor TOURISM is foremost related to the number of beds per tourist enterprise and the number of overnight stays per tourist enterprise in 2007. It controls touristic activities in a region. The INKAR data set serves a source for touristic demand as well.

Natural amenities like forest areas, water areas and recreation areas per inhabitant are associated with the factor NATURE. This factor might attract creative people, as they seem especially interested in outdoor activities (Florida, 2002a; McGranahan et al., 2011).

Crime is considered as a disamenity for the attractiveness of a region for mobile people. Considerable evidence exists that crime or the change of crime levels influences the population growth of cities and neighbourhoods (Cullen and Levitt, 1999; Ellen and O'Regan, 2009). However, artists should be particularly sensitive to high crime rates. Lloyd's (2002) case study of Wicker Park in Chicago and Pratt's (2009) study on Hoxton in London show that artists occupy run-down neighbourhoods and help to transform them. Accordingly, the factor CRIME is likely to influence the spatial distribution of artists. The variables 'property damages', 'street offences' and 'robberies' (per inhabitant) are most associated with this factor. Information on these variables is taken from the so-called "Deutscher Lernatlas 2011" (German Learning Atlas 2011), which is published by the Bertelsmann Foundation (Bertelsmann Stiftung, 2011).

Lorenzen and Andersen (2009) empirically investigate the rank size rule of the creative class compared to that of the rest of the population. They show that the slope for the creative class is steeper. Their explanation is that members of the creative class are attracted to central places because of specialized consumer preferences (e.g. restaurants, cafés, entertainment programmes, museums) and specialized job preferences (employees who work in high-technology industries) (Lorenzen and Andersen, 2009). According to Florida (2002b), this especially applies to artists, who would therefore be overrepresented in urban areas. This argument is taken into consideration with the factor URBAN. It is loaded to the variables 'population density' and 'price of construction land (\in per m²)'. Thus, it reflects urban externalities in form of productivity premium. Information for these variables is again taken from the INKAR database. In addition, the factor URBAN comprises the variables 'share of foreigners' and 'mixed marriages'. These two variables relate to the importance of openness and tolerance in attracting creative class members (Florida, 2002a). They not only account for tolerance, but also indicate the quality of foreigner integration into the regional society, respectively. Both are obtained from DESTATIS. One might argue that urbanity and tolerance towards foreigners might play different roles in attracting creative class members, but they cannot be statistically broken down in our analysis as they statically too closely related.

Social capital is also included because it is an important pull factor for artists. The factor SOCIAL is strongly correlated with the share of inhabitants committed to churches and religion, youth and the elderly. The Lernatlas serves as a data source.

Lastly, the factor CULTURE can be identified. The variables 'visitors of museums (per 100 inhab.)' and 'visitors of theatres and concerts (per household)' load high on this factor. Therefore CULTURE mainly represents the consumption of high culture in a region. The variables are derived from the INKAR data set. The German Weather Service (Deutscher Wetterdienst, DWD) provides data for regional sunshine hours. The variable 'mean sunshine hours per year over 30 years' for a region shows the highest loadings on CULTURE. Research from Glaeser et al. (2001) provides evidence for the effect of the climate on the distribution of human capital. Moreover, Florida (2002a) claims that the creative class is more attracted by amenities than overall human capital in general. However, it cannot be statistically isolated from the consumption of high culture.

Two additional factors are population growth (Δ POP) and GDP per capita growth (Δ GDP). They are primarily used as control variables. The first, population growth, is particularly important, because given a stable share of artists in a population, the population growth will also induce an increase in the number of artists in a region.

3.4.3 Reducing the dimensionality

For the construction of the factors, generally the values of the variables for the year 2007 are used. However, this is not possible for all variables or is unreliable due to reforms in the district delineations. In these cases the corresponding values for 2008 or 2009 are used. Only in case of graduates from artistic and cultural disciplines the mean value is used, because of yearly fluctuations in graduation (see in Table A.9 the Appendix).

The previously presented regional characteristics are empirically strongly correlated, and many of them are likely to approximate the same (underlying) regional factor. This is taken into account reducing the dimensionality by means of a factor analysis. The factor analysis groups variables based on their common statistical variance in order to extract a smaller number of factors. The number of factors is determined using the Kaiser criterion. It suggests extracting as many factors as there are eigenvalues larger than one for Principal Component Analysis and larger than zero for Factor Analysis in the variables' correlation matrix. Moreover, the parallel analysis compares the scree of factors from the observed and random data (Kabacoff, 2011). Based on these criteria, it is feasible to extract eight factors (see Figure 3.1). These eight factors are then interpreted according to the rotated factor matrix providing information on the variables' loading (see Figure 3.2).



Figure 3.1: Parallel analysis: Screeplot

However, not all regional characteristics are used for the factor analysis. Those variables that are different and those that are of a special interest from a theoretical point of view are excluded. The factor analysis condenses only level variables. In light of their dynamic nature, population growth and GDP per capita growth are not included, but instead remain independent control variables. The relative and absolute numbers of artists per region play an outstanding role (see theoretical discussion in Section 3.2) and therefore these factors are also kept independent.

0.6	-0.04	0.26	-0.05	0	0.15	0.13	-0.04	GDP .p.C
0.91	0.02	-0.02	-0.06	-0.02	0.05	0.02	0.02	foreign
0.91	0.01	-0.01	-0.04	-0.03	-0.08	-0.01	-0.02	mixed marriages
0.25	0.54	-0.05	-0.07	0.05	0.29	-0.06	0.07	gay
0.41	0.29	0.07	-0.15	-0.06	0.3	-0.03	0.11	density
0	0	-0.03	0.02	0.98	0	-0.01	-0.01	beds p. tourist
0	0.01	-0.01	-0.01	1	0.02	-0.01	0	overnight stays
-0.06	-0.28	0.09	-0.03	0.04	0.71	0.01	-0.03	property damages
0.01	0.11	0.1	-0.07	0	0.89	-0.01	0	street offences
0.13	0.26	-0.14	-0.01	-0.08	0.59	-0.12	0	robberies
-0.12	0.08	0.18	-0.06	0.31	-0.1	0.08	0.42	museum visitors
-0.08	0.13	-0.11	-0.18	-0.11	-0.07	-0.03	0.45	theater visitors
0.21	0.16	0.81	-0.07	-0.02	0.01	-0.01	0.09	inhabs. 25-30 years
-0.16	-0.05	0.92	0.04	-0.04	0.04	-0.01	0.03	inhabs. 18-25 years
-0.01	0.88	0.19	0	0	-0.02	0	-0.09	graduates arts
-0.02	0.94	-0.04	0	-0.01	0.01	0.02	0.07	graduates culture
0.1	0.12	0.71	-0.11	0.01	0.08	-0.03	-0.14	students
0.24	-0.12	0.19	0.13	0.08	-0.11	0.07	0.44	sun
0.02	0.01	0.01	0.83	0.03	-0.14	0.02	-0.14	forest
0.06	-0.03	-0.01	0.71	0.02	0.18	-0.06	0.19	water
-0.06	0.02	-0.03	0.95	0.02	-0.02	0.01	0	recreation
0.16	0.04	-0.05	-0.13	0.03	-0.19	0.63	-0.28	eng. religious
0.14	-0.01	-0.07	-0.03	-0.01	-0.04	0.84	0.06	eng. youth
-0.23	0.01	0.07	0.1	-0.01	0.14	0.78	0.07	eng. elderly
urban	milieu	young	nature	tourism	crime	social	culture	

Figure 3.2: Factor loadings

3.5 Model

Figure 3.3 visualizes the distribution of the mean annual (trend-corrected) growth rates. The visual inspection (empirical distribution (dark grey bars) vs. normal distribution (red line)) and a Shapiro Wilk's test of normality indicate that the growth rates are non-normally distributed²¹.

 $[\]overline{^{21}}$ Shapiro-Wilk normality test: W = 0.9724, p-value = $4.922 \cdot 10^{-7}$



Figure 3.3: Distribution of growth rates

Source: KSK (2011), own calculation

Thus, analyses rely on Quantile Regression (QR) (also known as least-absolute deviation regression), because it is less impacted by outliers and more appropriate when the dependent variable is not Gaussian (Koenker and Hallock, 2001; Coad and Rao, 2006). Moreover, the model suffers from heteroscedasticity violating a central assumption of Ordinary Least-Square Regression (OLS)²². QR can estimate the regression also in the presence of heteroscedasticity and models the changes in the dependent variable in multiple points of the distribution (Davino et al., 2014).

QR can be explained by comparing it to conventional OLS. OLS is used to estimate the conditional *mean* of a dependent variable Y in response to a set of covariates X. This is done by minimising the squared error sum. QR extends this approach by estimating the conditional *distribution* of a dependent variable Y in response to a set of covariates X. In contrast to OLS, this is done by minimising the sum of absolute deviations for a given quantile. OLS is used to answer questions like: "What – in the mean – explains regional growth rates of artists?". QR can answer this question at any quantile, thus giving information of the shape of

²² Breusch Pagan test of homoscedasticity: BP = 40.5603, df = 12, p-value = $5.802 \cdot 10^{-5}$

the relation of dependent and independent variables over the whole conditional distribution. Therefore, differences between determinants of high and low or negative growth rates can be analysed. Similar to OLS, QR can estimate the impact of a one unit change on the dependent variable for any given quantile (Davino et al., 2014; Koenker and Hallock, 2001).

To further increase the reliability of the results, bootstrapped standard errors are employed allowing for robust and reliable statistical inference (Elfron, 1979).

In addition, the statistical analysis shows that the growth rates are not spatially auto-correlated (Moran's I = 0.04, sig. = 0.08) as well as the residuals of the QR (Moran's I = 0.04, sig. = 0.10). As a result geographic dependencies is not included in the estimations.

3.6 Empirical results

3.6.1 Spatial distribution of freelance artists in Germany

Before presenting the results of the analyses, some brief impressions on spatial distribution of artists and its change over time are provided.



Figure 3.4: Distribution of freelance artists by districts (2007)

Source: KSK, own calculation

The map in Figure 3.4 illustrates relative and absolute spatial distribution of artists in Germany in the year 2007 representing the base level of our analyses. The mean is about 395 artists per district (SD = 1610.6)²³.

Not surprisingly, the largest number of artists is found in Berlin (27,309). Next is Hamburg with 11,701 artists, followed by Munich (10,140), Cologne (8,097), and Frankfurt (3,195) (see Table 3.1). A correlation test confirms that the absolute number of artists and the size of the regional population strongly correlate ($r = 0.9^{***}$)²⁴.

Rank	absolute		per thsd. inhal	os.
1	Berlin	27,309	Cologne	8.1
2	Hamburg	11,701	Berlin	8.0
3	Munich	10,140	Munich	7.7
4	Cologne	8,097	Freiburg i. B.	6.8
5	Frankfurt a. M.	3,195	Hamburg	6.6
6	Düsseldorf	3,075	Starnberg	5.6
7	Stuttgart	2,568	Weimar	5.6
8	Hanover	2,378	Düsseldorf	5.3
9	Leipzig	1,901	Frankfurt a. M.	4.8
10	Dresden	1,703	Potsdam	4.5

Table 3.1: Absolute and relative concentration: Top 10

Source: KSK, own calculation

Interesting insights are also obtained by looking at the distribution of the relative artist numbers. The mean of all regions is 1.31 artists per 1,000 inhabitants (SD = 1.09). In this case, Cologne ranks first with 8.1 artists per 1,000 inhabitants, Berlin (8.0) ranks second, and Munich third (7.7), followed by Freiburg im Breisgau (6.8) and Hamburg (6.6). These patterns suggest that artists do indeed prefer living in urban regions. However, the correlation of $r = 0.58^{***}$ between the share of artists and population density is only moderately high.

The map in Figure 3.4 reveals some surprising agglomerations of artists. For

 $[\]overline{^{23}}$ SD = standard deviation.

²⁴ *, ** and *** indicate significance at the levels of 0.1, 0.05 and 0.001, respectively.

instance, a significant agglomeration of artists is observed in regions on the coast of the Baltic Sea, in the Alpine foreland, and in a number of other rather remote regions. Since these regions are known as very touristic places, it may hint at this factor being relevant.

Some further interesting insights are gained when disaggregating the numbers of artists into different branches. The largest branch is visual artists (35.9%), next are musicians (26.4%), writers (25.6%) and performing artists (12.1%).

The spatial distribution of the four branches somewhat diverges from that of the aggregated one (see Table 3.2). While the absolute rankings are still dominated by large cities (Berlin, Hamburg, etc.), some comparatively smaller cities such as Hanover and Stuttgart appear to be important locations for artists of particular branches.

Rank	Absolute		per thsd. inhabs.					
Visual artists								
1	Berlin	9,076	Düsseldorf	2.9				
2	Hamburg	4,518	Munich	2.8				
3	Munich	3,718	Berlin	2.7				
4	Cologne	2,523	Hamburg	2.6				
5	Düsseldorf	1,682	Cologne	2.5				
6	Frankfurt a. M.	1,195	Darmstadt	2.0				
7	Stuttgart	1,075	Freiburg i. B.	2.0				
8	Hanover	870	Starnberg	2.0				
9	Leipzig	647	Frankfurt a. M.	1.8				
10	Nürnberg	639	Stuttgart	1.8				
	Performing artists							
1	Berlin	4,749	Berlin	1.4				
2	Hamburg	1,378	Cologne	1.2				
3	Munich	1,244	Munich	0.9				
4	Cologne	1,242	Freiburg i. B.	0.9				
5	Frankfurt a. M.	365	Hamburg	0.8				

Table 3.2: Ranking of the distribution of freelance artists per branch

6	Stuttgart	362	Potsdam	0.7	
7	Hanover	312	Weimar	0.6	
8	Düsseldorf	307	Stuttgart	0.6	
9	Dresden	233	Frankfurt a. M.	0.6	
10	Leipzig	226	Düsseldorf	0.5	
	М	lusicians			
1	Berlin	5,541	Weimar	2.7	
2	Hamburg	2,239	Freiburg i. B.	2.3	
3	Munich	1,641	Berlin	1.6	
4	Cologne	1,459	Cologne	1.5	
5	Hanover	669	Starnberg	1.3	
6	Frankfurt a. M.	650	Hamburg	1.3	
7	Stuttgart	592	Karlsruhe	1.3	
8	Dresden	560	Munich	1.3	
9	Leipzig	524	Würzburg	1.2	
10	Freiburg i. B.	498	Potsdam	1.1	
Writers					
1	Berlin	7,943	Cologne	2.9	
2	Hamburg	3,566	Munich	2.7	
3	Munich	3,537	Berlin	2.3	
4	Cologne	2,873	Hamburg	2.0	
5	Frankfurt a. M.	985	Starnberg	1.8	
6	Düsseldorf	674	Bonn	1.7	
7	Stuttgart	539	Freiburg i. B.	1.6	
8	Bonn	530	Frankfurt a. M.	1.5	
9	Hanover	527	Heidelberg	1.3	
10	Leipzig	504	Düsseldorf	1.2	

Source: KSK (2011), own calculation

The importance of smaller cities becomes even more evident when the number of artists is set into a relationship with the regional population size. For instance, relative to its population, Düsseldorf has the highest agglomeration of visual artists. Freiburg im Breisgau is (in relative terms) an important region for performing artists and even more important for musicians. Musicians in particular turn out to be less concentrated in big cities – Weimar and Freiburg im Breisgau rank first and second.

The ranking for writers suggests that these have a preference for an urban environment, because cities like Cologne, Munich, Berlin and Hamburg are ranked high, however an attractive landscape (Starnberg²⁵) seems to be a valid substitute.



Figure 3.5: Distribution of artists' branches relative concentration

Source: KSK (2011), own calculation

²⁵ Starnberg is located between Munich and the Alps with the beautiful landscape of Lake Starnberg.

However, Figure 3.5 reveals the distribution of artists' branches relative concentration. It becomes obvious that these are skewed. Especially performing artists are concentrated in only a few places.





Source: KSK (2011), own calculation

To get a better understanding of the extent to which artists are spatially concentrated the Gini coefficient is estimated and corresponding Lorenz Curves plotted (see Figure 3.6). Accordingly, writers and performing artists are most concentrated (g = 0.75, g = 0.76), followed by visual artists (g = 0.69), and musicians (g = 0.6). Compared to the overall population (g = 0.39), the spatial concentration of artists proves to be very high.

Moreover, the distribution of the share of artists in certain branches per region

is skewed (Figure 3.7). The share of musicians varies most strongly, with values between 13.4% and 65.6%. In case of performing artists the share ranges between 0.0% and 41.6%. This implies that there are regions without any registered self-employed performing artists. The share of the other branches varies less (visual artists: 10.5 - 59.0%; writers: 5.5 - 43.9%). In general, most regions show a mix of artistic branches.





Source: KSK (2011), own calculation

Lastly, the spatial distribution of the different branches of artists is strongly correlated. Figure 3.8 depicts the correlation of the relative concentration of these branches. The strongest relationship exists between writers and performing artists

as well as writers and visual artists. The lowest correlation is exhibited in the spatial distribution of musicians with members of the other branches.



Figure 3.8: Correlation of the relative concentration of artists' branches

Source: KSK (2011), own calculation

Overall the spatial distribution of artists is characterised by a high concentration in relatively few places. The absolute concentration of artists is closely related to the overall population. However, relatively to population size, the concentration of artists reveals a distinct agglomeration in less populated regions. Moreover, each artist branch shows a unique spatial pattern. Finally, regional profiles with specialisation in particular artistic fields are identified.

3.6.2 Change of the distribution over time

The number of artists in German regions increased by 7.5% from 162,815 in the year 2007 to 174,958 artists in 2010. The growth patterns of the four branches differ considerably. The number of performing artists grew fastest, by 11.7% from 2007 to 2010, followed by musicians with 10.0%, writers with 6.6%, and visual artists with a 4.8% growth (see Figure 3.9).



Figure 3.9: Growth of artists 2007 - 2010

Source: KSK (2011), own calculation

Regional trend-corrected growth rates between 2007 and 2010 range from -12.6% to 9.9%. Accordingly, there are considerable variation in regional growth. This is visualized in Figure 3.10 which shows the growth of artists per region between 2007 and 2010. Interestingly, a quite ambiguous pattern is observed: regions with fast growing artist populations are large core regions like Hamburg, Berlin and Cologne and remote regions with low populations such as Weimar, some regions on the Baltic Coast and some regions near the Alpine Foreland. A similar picture is obtained for negative growth rates that characterize regions with substantial agglomerations of artists in a total population (e.g. Freiburg im Breisgau) and regions with low artist agglomerations (e.g. Bamberg).

Figure 3.10: Growth rates of freelance artists 2007–2010 by districts



Source: KSK (2011), own calculation

Moreover, Table 3.3 reveals that the most extreme growth between 2007 and 2010 occurs in regions with low absolute numbers of artists.

Rank	Name	abs. (2007)	per thsd. inhabs. (2007)	growth rate [%] (2007–2010)	
1	Kronach	31	0.4	9.9	
2	Tirschenreuth	25	0.3	7.8	
3	Wismar	23	0.5	7.3	
4	Remscheid	64	0.6	6.9	
5	Herne	98	0.6	6.4	
6	Cham	78	0.6	6.2	
7	Weimarer-Land	94	1.1	6.1	
8	Roth	105	0.8	6.0	
9	Schwandorf	73	0.5	5.9	
10	Emden	33	0.6	5.9	
		•••			
403	Wesermarsch	58	0.6	-6.5	
404	Lichtenfels	33	0.5	-6.6	
405	Bremerhaven	57	0.5	-6.6	
406	Mecklenburg-Strelitz	81	1.0	-6.9	
407	Peine	86	0.6	-7.5	
408	Cochem-Zell	57	0.9	-7.9	
409	Straubing-Bogen	79	0.8	-7.9	
410	Stralsund	20	0.3	-8.6	
411	Suhl	42	1.0	-11.1	
412	Altmarkkreis Salzwede	68	0.7	-12.6	

Table 3.3: Ranking mean trend corrected growth rates 2007-2010

Source: KSK (2011), own calculation



Figure 3.11: Correlation of growth rates (2007–2010) and initial artists' concentrations (2007)

Source: KSK (2011), own calculation

However, there is no clear relation between subsequent growth rates and the initial absolute and relative concentration of artists in a region (see Figure 3.11). The trend lines in Figure 3.11 represent regressions on the respective quantile indicated by colour. There is a positive relation of growth rates and initial relative concentration in cases of quantiles under the median. In contrast, the correlation seems negative for higher quantiles of the distribution. Particularly, the data for regions with a relative concentration lower than three artists per 1,000 inhabitants is noisy and ambiguous. These cases coincide with relative low absolute concentrations. Thus, small absolute changes of the population of artists result

in high positive or negative growth rates in these regions. Looking at particular regions, the data reveals a positive relation of the initial concentration and subsequent growth in cities like Berlin, Hamburg, Cologne and Weimar, for instance. Simultaneously, the association seems negative for Munich, Frankfurt, Düsseldorf and Freiburg. These results emphasize – on the one hand – the necessity to rely on quantile regressions to explore the determinants of regional growth rates of artists. On the other hand other factors than the initial concentration seem influential and should thus be taken into account.



Figure 3.12: Distribution of growth rates (2007–2010) of artists' branches

Source: KSK (2011), own calculation

The growth rates of the branches are very different. Growth rates are nonnormally distributed for all four branches. The highest variation can be observed for visual artists (see 3.12).

Interestingly, diverging patterns of the relation of the initial concentration and subsequent growth rates between the different branches are found (see 3.13). The

blue line in Figure 3.13 represents the median regression for the relation of initial relative concentration and subsequent growth rates. The initial relative concentration of musicians is positively associated with subsequent growth rates of musicians. The opposite relation is observed in case of writers and performing artists. The flat blue trend line for visual artists suggests no correlation of initial concentration and subsequent growth rates. However, the variation in growth rates is again driven by regions with low initial absolute and relative concentrations.





(a) Visual artists



(c) Writers



Source: KSK (2011), own calculation

3.6.3 Determinants of the concentration of freelance artists

This section follows the common – but static – approach in the creative class literature to explain the spatial concentration of artists.

Table 3.4 shows the results for median regressions predicting the relative concentration of artists in the year 2007. Regional factors, as described in Section 3.4.2, serve as independent variables.

First, the factors URBAN, MILIEU and CULTURE are significant in the model for all artists as well as in all models for the branches. The concentration of artists is higher in urban regions that are characterised by high population density, tolerance towards foreigners and higher productivity in terms of GDP per Capita. The factor MILIEU relates to an open and creative environment. It is constructed

from the number of graduates of artistic and culture disciplines per inhabitant and the share of same-sex marriages out of all marriages. Thus, it comprises an endogenous endowment of graduates that potentially can become self-employed in arts. Moreover, it reflects a young audience that is interested in arts and culture. The share of same-sex marriages could be an indicator for tolerance towards minorities. CULTURE is associated with the consumption of high culture in a region. Therefore, it indicates the demand for cultural and artistic products. These general finding are in line with Florida's ideas.

	All			Visual	Performing
	artists	Musicians	Writers	artists	artists
URBAN	0.190***	0.054***	0.046***	0.101***	0.018***
	(0.053)	(0.013)	(0.014)	(0.02)	(0.007)
MILIEU	0.918***	0.144^{***}	0.238^{***}	0.306***	0.107^{***}
	(0.114)	(0.023)	(0.048)	(0.043)	(0.01)
YOUNG	-0.075^{*}	0.030^{***}	-0.021	-0.017	-0.012^{*}
	(0.043)	(0.011)	(0.013)	(0.017)	(0.007)
NATURE	-0.022	-0.017^{*}	-0.002	-0.005	-0.002
	(0.026)	(0.011)	(0.009)	(0.01)	(0.004)
TOURISM	0.034	0.004	0.005	0.038^{**}	-0.003
	(0.035)	(0.008)	(0.014)	(0.018)	(0.005)
CRIME	-0.015	-0.036***	0.009	-0.013	0.005
	(0.024)	(0.01)	(0.008)	(0.013)	(0.005)
SOCIAL	0.052^{**}	0.001	0.004	0.033***	0.002
	(0.025)	(0.008)	(0.006)	(0.011)	(0.004)
CULTURE	0.175^{***}	0.042^{***}	0.047^{***}	0.086^{***}	0.029^{***}
	(0.041)	(0.009)	(0.014)	(0.016)	(0.007)
Constant	1.219^{***}	0.376^{***}	0.251^{***}	0.438^{***}	0.123^{***}
	(0.029)	(0.009)	(0.014)	(0.013)	(0.005)
Pseudo R ²	0.38	0.29	0.33	0.36	0.32
Ν	412	412	412	412	412

Table 3.4: Median regressions: Relative concentration of artists in 2007

Source: KSK (2011), own calculation; sign.: *p<0.1; **p<0.05; ***p<0.001

Only some of the other factors are significant in the overall model or in one of the branch models. The factor YOUNG is negatively significant in the model for all artists and performing artists. However, the coefficients are only significant at the 10% level. Contrarily, YOUNG is positive and highly significant in the model for musicians. This corresponds to research by Bader and Scharenberg (2010) who show the relevance of a young and open-minded audience for a thriving music scene. Moreover, Hracs et al. (2011) and Grant and Kronstal (2010) provide evidence for the vital role of universities and their students as a substantial demand factor for musicians that can also attract musicians from outside a region.

NATURE is not significant in most models but is negatively correlated with the relative share of musicians (sign.: 10%-level). This is in contrast to the expectations from the literature review. Either musicians are not interested in outdoor activities or their products and services need spatial proximity to their consumers. Moreover, it seems plausible that weather or climatic conditions do not have a huge impact on musicians as they normally work indoor. However, proximity to consumers seems more relevant as the positive coefficients of URBAN, MILIEU and CULTURE point in this direction, too.

TOURISM seems especially important for visual artists. TOURISM might indicate the demand for local art in form of paintings, sculptures and other art objects as souvenirs for tourists.

The factor SOCIAL is significant in the overall model and also in the model for visual artists. Thus, at least for some artists social capital can be beneficial in order to compensate for the uncertainty of or to promote the career as an artist.

Lastly, CRIME is negatively and significantly associated with the share of musicians. Thus, the result confirms the assumption that crime can be a disamenity and repel artists.

Looking at the effect size of factor, the coefficients of MILIEU are highest, followed by URBAN and then CULTURE. This indicates the importance of the endogenous potential in a region to increase the number of local artists. Moreover, these factors reveal openness, urbanity and the interest or consumption of cultural and creative goods or services.

To judge the explanatory power of the models, a pseudo- R^2 according to Koenker and Machado (1999)) is calculated. Values range between 0.29 - 0.38 which is relatively high, thus indicating a high explanatory power of models.



Figure 3.14: Quantile regression: Relative concentration of artists in 2007

Source: KSK (2011), own calculation

QR can model the relation of dependent and independent variables over the whole conditional distribution of the dependent variable. Figure 3.14 shows results for the overall model. It is to be understood as follows: the x-axis represents the distribution of the dependent variable and the y-axis the coefficient of an independent variable. The dashed black line with dots is the estimation of the coefficient of the QR. The grey ribbon represents the 95% confidence interval according to the bootstrapped standard errors. The solid red line is the coefficient of an OLS

with the dashed red lines defining the 95% confidence interval of OLS standard errors. The horizontal black line marks a coefficient value of zero. A coefficient is statically significant, if the 95% confidence interval does not intersect with the zero line. Moreover, if the confidence intervals of QR and OLS do not intersect, the estimations are statistically significant different from each other.

What can be seen from the graphs is that in case of NATURE, TOURISM and CRIME, an OLS would overestimate the effect of these factors. According to the QR these factors are only significant for small parts of the distribution.

NATURE is negatively associated in regions of high relative concentration, but seems not to affect regions of lower relative concentration, except regions with very low concentrations. Thus, the relation is an inverted U-shape. CRIME seems to be problematic in regions with very low relative concentrations. TOURISM unfolds its positive effect only in regions with very high relative concentrations.

The coefficients of the factors URBAN, MILIEU and CULTURE are significant over the whole distribution of the dependent variable. In addition, the size of coefficients increases with the quantile level of the dependent variable. This means that URBAN, MILIEU and CULTURE are even more important for explaining high relative concentrations of artists.

Figure B.2 in the appendix illustrates the QRs for the different sub-branches. In case of musicians, the relation of dependent variables and the factors URBAN and MILIEU is rather constant compared to the overall model. Thus, the impact of these factors seems not to depend on the degree of relative concentration of musicians. However, YOUNG plays only a role for regions with lower relative concentrations. Regions of lower concentrations may be more dependent on the local demand of a young audience than regions with higher concentrations that can attract audience from outside the region. The negative influence of NATURE even increases with the degree of relative concentration. This results further supports the assumption that demand and thus spatial proximity to the audience is especially relevant for musicians. The coefficient of CRIME is approximately constant, but CULTURE increases as in the overall model (Figure B.2 (a)).

The model for writers yields similar results as the overall model. The coefficients of URBAN, MILIEU and CULTURE increase with the level of concentration. Only YOUNG reveals an unexpected relation. For region with higher relative concentrations the coefficient is negative. However, there is no obvious explanation for this fact (Figure B.2 (b)).

URBAN, MILIEU and CULTURE again show increasing coefficients in the model for visual artists. Notably, TOURSIM reveals the same tendency, indicating that regions with higher relative concentrations of visual artists benefit even more from a high touristic demand. The graph of factor SOCIAL implies that social capital is relevant in regions with an average relative concentration of visual artists (Figure B.2 (c)). A possible explanation could be that a critical mass is necessary for social capital. However if the community of artists becomes too large, it breaks up into smaller groups.

The model for performing artists does not yield much deviation from the overall model (Figure B.2 (d)).

In conclusion, this section shows that the explanation for a relative concentration of artists mainly stems from an urban and tolerant environment supplemented by a demand for cultural and creative goods and services. Moreover, the endogenous supply of home grown artists also seems to be relevant. These results are in line with Florida's ideas of an urban, amenity-rich and open climate that attracts creative class members.

Moreover, results show that the relevance of regional factors varies with the degree of concentration of artists and depends on the artistic branches.

However, these findings result from static models which are less appropriate for analysing the inherent dynamic nature of agglomeration processes. Thus, the next section applies a dynamic approach to explain regional growth patterns of artists.

3.6.4 Determinants of regional growth of freelance artists

Section 3.6.2 highlighted the existence of significant variations in the growth of regional artist populations. The following section explores to what extent the endowments of a region with amenity-related and / or economic factors in the year 2007 relate to subsequent growth rates between 2007 and 2010.

	All	Musicians	Writers	Visual	Performing
ART07	0.0002				
Δ ΡΤΡΟΟ7	(0.0002)				
ART CO/	(0.23)				
MUSIC07		0.001			
MUSICDC07		(0.002)			
MUSICI CU/		(1.32)			
WRIT07			0.001		
			(0.001)		
WRITPC07			-4.16 (1.83)		
VIS07			(1.05)	0.001	
				(0.001)	
VISPC07				-1.27*	
DEDE07				(0.72)	0
I LKI 07					(0.004)
PERFPC07					-13.16**
	***	***			(6.26)
ΔPOP	0.38***	0.87^{***}	0.31	0.15	0.43
	(0.11)	(0.27)	(0.29)	(0.17)	(0.42)
ΔGDP	-0.03	0.01	-0.11	-0.02	-0.11
	(0.04)	(0.07)	(0.09)	(0.04)	(0.12)
URBAN	-0.25	-0.08	-0.1	-0.23	-0.84
	(0.25)	(0.36)	(0.49)	(0.3)	(0.76)
MILIEU	0.08	-0.28	0.4	-0.3	1.98^{*}
	(0.26)	(0.53)	(0.57)	(0.43)	(1.16)
YOUNG	0.17	0.11	-0.02	-0.04	0.88
	(0.14)	(0.33)	(0.32)	(0.28)	(0.55)
NATURE	-0.07	0.14	0.29	-0.47	0.41
	(0.29)	(0.38)	(0.58)	(0.41)	(0.64)
TOURISM	0.24	-0.24	-0.02	0.3	0.26
	(0.26)	(0.45)	(0.47)	(0.34)	(0.49)
CRIME	0.03	-0.14	0.39	0.41**	-0.001
CIUIL	(0.16)	(0.29)	(0.4)	(0.2)	(0.55)
SOCIAL	0.15	0.18	(0.7)	0.01	0.41
JUCIAL	(0.15)	(0.25)	(0.23)	(0.22)	(0.51)
CUITURE	0.10)	0.55	(0.37)	0.62*	0.11
CULIUKE	0.04	-0.03	(0.2)	(0.03)	$(0, \epsilon_4)$
Constant	(0.19)	(0.57)	(0.39)	(0.33)	(0.04)
Constant	1.04	1.53	0.58	0.07	0.96
	(0.4)	(0.65)	(0.72)	(0.5)	(1.25)
Pseudo R ²	0.04	0.03	0.04	0.02	0.04
Ν	412	412	412	412	412

Table 3.5: Median regressions: Growth rates of artists between 2007–2010

Source: KSK (2011), own calculation; sign.: *p<0.1; **p<0.05; ***p<0.001
The results of the quantile regressions are shown in Table 3.5. The first model (ALL) is estimated with regard to the growth of the total regional populations of artists, i.e. no differentiations are made between branches of artists. The other models show the results for the four branches (musicians, writers, visual and performing artists).

The model for the growth of total populations (ALL) reveals that population growth (Δ POP) and the relative concentration of artists in 2007 (ARTPC07) are the best predictors for growth of regional artist populations.

There might be two reasons for the significance of population growth. First, increasing populations may 'automatically' imply increasing numbers of artists if they represent a more or less fixed share of the population. In addition, population growth makes regions more attractive for artists as it implies an increasing demand for artistic products and services.

With respect to the effect of the relative concentration of artists (ARTPC07), two alternative hypotheses were formulated (see Section 3.2). Either a high relative agglomeration facilitates subsequent growth rates, because of positive externalities due to knowledge spill-over effects, the awareness of creative communities and their political power (Currid, 2010) or a high relative concentration has a negative impact, because of an increased competition of artists for customers, suppliers and resources (e.g. public funding of arts) (Hracs et al., 2011). Moreover, artists are less prosperous in economic terms than the rest of the creative class, therefore they are more sensible to increasing factor prices – e.g. affordable spaces for galleries – as a consequence of a high relative agglomeration (Peck, 2005).

Results indicate the latter negative effect. Regional growth rates of artists between 2007 and 2010 are negatively impacted by a high relative concentration in 2007.

No other factors are significant in the model, and therefore the first two hypotheses can be evaluated with respect to the factors driving the growth of artist populations in regions. According to hypotheses H1, Florida's amenity-related factors are expected to be more relevant than the economic factors. This hypothesis is clearly rejected with respect to natural or cultural amenities. None of these factors are significantly related to the growth rates of artists. However, hypothesis

H2 cannot be rejected. There is statistical evidence indicating that agglomeration effects that are related to the size of regional artist populations affect the latters' growth.

Figure 3.15 provides information about the whole conditional distribution of the dependent variable and regional factors. Additionally, it shows the values of growth rates of certain percentiles.



Figure 3.15: Quantile regression: Growth rates of artists between 2007–2010

Source: KSK (2011), own calculation

In comparison to the QR, when applying OLS only the factor population

growth (Δ POP) is significant. Moreover, the QR gives additional information about the shape of the conditional distribution. In case of the relative concentration of artists in 2007, regions with negative growth rates (40th percentile and lower) are not affected negatively by ARTPC07. Only regions with positive growth rates are subject to this effect. This further supports the hypothesis of rivalry among artists for scare resources, when the relative concentration exceeds a certain threshold.

	ALL	Musicians	Writers	Visual	Performing
10 th	-3.17	-4.90	-6.31	-4.95	-11.41
20^{th}	-1.76	-3.14	-4.43	-2.87	-7.40
30^{th}	-1.04	-2.11	-2.82	-1.76	-4.33
40^{th}	-0.49	-0.86	-1.82	-0.75	-2.98
50^{th}	0.10	0.10	-0.88	0.19	-1.14
60 th	0.57	1.19	0.11	0.85	0.77
70 th	1.22	2.09	1.93	1.60	2.38
80^{th}	1.81	3.19	4.30	2.75	5.49
90 th	3.11	4.63	8.61	4.68	10.21

Table 3.6: Percentiles of regional growth rates [%]

Source: KSK (2011), own calculation

The positive effect of population growth (ΔPOP) is only insignificant for regions with very high growth rates. A possible explanation is that these regions experience immigration with a disproportionally lower share of artists.

The models for the four artist branches reveal the existence of significant differences. Population growth positively correlates to the growth of regional communities of musicians. A similar effect is not observable for the other three branches. This finding might indicate the relevance of variations of production and consumption schemes among the branches. Musicians are more strongly dependent on local demand and need proximity to their audience. Research by DiCola (2013) indicates that live performances are the most important source of income for musicians accounting for 28% altogether. Teaching is also important (22%). Sales from records only account for 6%. Live performances can partly be 'exported' to other regions, but teaching probably occurs within the same region. However, for writers or visual artists it can be assumed that they are able to transfer their products (i.e. written texts, paintings) easily across large geographical distances.

Performing artists also depend on local demand, because the proximity to an audience matters as well. One explanation can be that performing artists generate more income from public funding and expenditures compared to musicians. Therefore, musicians react more to the demand from private households.

A positive and significant coefficient for CRIME is observed in the model of growth rates of visual artists, though the results are somewhat counter-intuitive. Why would visual artists in particular be attracted to regions showing above average crime rates? A potential explanation might be that visual artists seek regions offering abundant and cheap space to set up art galleries and studios. However, this explanation remains speculative and needs more research on the individual level. Moreover, reveals that the coefficient is only significant for a very small part of the distribution.

In contrast to musicians, localization externalities matter in explaining the population growth of visual and performing artists as well as writers. According to the results, theses branches are subject to negative localization effects that come into effect when these artists are overrepresented in the regional population (negative coefficient of VISPC07, PERFPC07 and WRITPC07).

Visual and performing artists are particularly dependent on the public support of cultural infrastructure such as museums, theatres and galleries, and as a result negative externalities may arise when public expenditures for this infrastructure, which constitute supply and demand, do not increase proportionally. In contrast to visual and performing artists, a persuasive explanation in the case of writers cannot be given. As argued above, a writer's location affects the supply and demand conditions only to a limited extent. Probably, these individuals particularly benefit from intensive interaction and exchange with other writers. Accordingly, this finding clearly contradicts expectations and deserves more research in the future. shows that the negative effect is especially relevant for visual and performing artists. In both cases the negative impact occurs, when growth rates are high.

The population of performing artists grows more in regions that are characterized by a creative milieu (positive coefficient MILIEU). There are two plausible explanations. First, performing artists are comparatively immobile, and therefore they frequently remain in the region where they obtain their university degree. Secondly, graduates from cultural or artistic disciplines represent an important demand group for their products and services. Borgonovi (2004) shows that performing arts consumption is higher, if the consumers themselves had received an education in arts, for example art courses at high school. Moreover, the factor MILIEU loads relatively high and positive on the variable share of same-sex marriages. This could indicate openness and tolerance which is an important pull factor according to Florida (2002a). Moreover, there is some evidence in the literature that sexual orientation is related to arts consumption. Lewis and Seaman (2004) provide evidence that the consumption of arts and cultural services is higher for gay, lesbian and bisexual individuals. However, reveals that the positive effect mainly holds true for regions with negative growth rates, which means that in these regions a negative trend could be hampered by MILIEU.

The factor CULTURE is significant in the model for musicians and visual artists. The regional growth rates of visual artists are positively correlated. The factor comprises museum and theatre visitors which reflect the demand for high culture in a region. This demand effect seems positive for visual artists. However, this effect is not observed for performing artists. On the contrary, musicians are negatively affected. A possible explanation is a substitution effect provided that the visit of a theatre and museum is a substitute for a concert. The high demand for one cultural good or service occurs at the expense of other branches. However, there is no clear evidence in the literature about complementary or substitutive consumption of arts and cultural services from different branches Seaman (2006). Figure B.3 (a) provides information about the shape of the relation for musicians. It becomes obvious that the negative effect only appears for the percentiles between the 50th and 70th. Therefore, the negative effect should not be overestimated.

The results for the models on the growth rates of disaggregated artists clearly suggest that hypothesis H3 has to be confirmed. Specific production and consumption schemes of artist branches alter the effect of regional factors on the agglomeration of artists. In this sense, artists are a heterogeneous group, implying that hypothesis H2 can be confirmed for visual and performing artists as well as for writers. There is not an effect of localization externalities for musicians. This heterogeneity among artists is confirmed by Faggian et al. (2012). These authors also find pronounced differences within the group of bohemian graduates regarding their spatial behaviour and careers (location choice, starting a job, full time vs. part time work, income and self-employment).

In conclusion, there is not enough convincing evidence for the relevance of amenity-related factors emphasized by Florida and his followers. It seems implausible that visual artists should be attracted and musicians repelled by cultural amenities in Florida's view. Thus, regarding CLUTURE as a demand factor for artists seem more plausible. With the exception of MILIEU, no empirical evidence is found for the factors highlighted in this literature stream such openness and tolerance. Accordingly, hypothesis H1 has to be rejected for models on the basis of the disaggregated artist growth rates as well.

Overall the explanatory power of dynamic models is low. The pseudo- R^2 is 4% for the overall model and even lower for musicians and visual artists. Even though models for growth rates usually suffer from low R^2 (Coad and Broekel, 2012), a large part of the variation in regional growth rates is unexplained by the models. There are several explanations for this. First, the data set accounts for insurance members in a certain region at a certain point in time. Variations over time and space do not necessarily represent individual behaviour or decision of members. Members could cancel their insurance for various reasons such as a shift into an employed job, start-up of an own business or retirement. Secondly, the time period of four years is perhaps too short. There may be a delay between the demand and supply. Thus, potentially self-employed artists have to recognise the opportunity to become a freelance artist and then take the necessary steps towards this career. Thirdly, the theoretically deduced factors are insufficient. They relate to human capital in general or the creative class in particular. However, analyses focus on very particular occupations in detail. Other factors might be more relevant to freelance artists. This leads to the last explanation. The use of quantitative and regional aggregated data is not sufficient for answering the research question. On the one hand, it attempts to deduce individual behaviour

from a variation of aggregated numbers. Thus, it would be more appropriate to take the individual as the level of analysis. On the other hand, qualitative methods could deliver valuable insights into individual behaviour which is likely to be complex and where no quantitative data sets are available.

3.7 Conclusion

The chapter contributes to the ongoing debate on what regional factors make a region attractive for the creative class. In order to avoid the problematic definition of the creative class, analyses focused on the spatial distribution of artists and the temporal change. Using quantile regression and panel data on 412 German districts, it is shown that the amenity-related factors put forward by Florida and followers fail to explain the agglomeration processes of artists. In contrast, the results clearly confirm the relevance of economic factors which are central in the literature on regional production systems, local labour markets and externalities. Next to population growth and localization, externalities in particular play a significant role. Such externalities are related to negative effects which come into existence when the number of regional artists becomes too large in comparison to the population.

The chapter delivers two more advancements to the existing literature. First, by disaggregating the group of artists into four branches, the chapter identifies branch-specific production and consumption schemes altering the importance of regional factors. Accordingly, even this comparatively small group of artists is significantly heterogeneous when it comes to the factors explaining their regional agglomeration.

Secondly, the study advances existing empirical approaches on this topic. This particularly concerns its focus on the population growth of artists instead of the more common empirical analysis of the absolute artist population size. The static analyses seem to confirm the findings from this stream of literature. However, when a dynamic perspective is applied – and thus a more appropriate approach – results changed substantially. In addition, the dynamic perspective clearly concentrates on a subgroup of well-identifiable members of the creative class and models branch-specific localization externalities as a function of the number of artists in

a region.

Nevertheless, there are a number of shortcomings that need to be pointed out. First and most importantly, the dataset does not allow to differentiate between endogenous regional growth and migration. The change in the number of artists in a region, i.e. migration, depends only to a certain extent on regionally exogenous factors. Despite the above average spatial mobility of artists that is postulated (but not empirically backed up) by Florida, the change in the number of artists in any given region should depend more on the behaviour of the endogenous artists than on migration to and from that region. In terms of the stock (the endogenous stock of artists in a region), the question arises of whether it is growing or declining (independently of migration). In general, the characteristics of a region itself are likely to be more important for changing the number of endogenous artists than those of other regions. When investigating the importance of particular regional factors, many studies – including this present study – just look at the net change in the number of members of the creative class in a certain region. However, this number is subject to inter-regional migration of members and changes in the endogenous stock of members. Regional factors of the kind investigated in this present study may play completely different roles in the two processes. For instance, universities provide degrees of artistic or cultural disciplines and thereby 'transform' inhabitants into artists. They also attract young people interested in a career in a creative job or sector from outside the region. When they graduate, those students stay in their university's region and enlarge the population of the creative class (Florida et al., 2008). These two different roles are overlooked when investigating the net change in the number of regional creative class.

Accordingly, future studies need to disaggregate the net change into the net result of migration and the net change due to regional endogenous processes. Regional characteristics then need to be evaluated to see whether they have an impact on migration decisions or if they stimulate a region's endogenous potential of the creative class. The second shortcoming of the present study is the potential underestimation of the role of amenities, because indicators predominantly focus on cultural and natural amenities.

It is generally difficult to empirically approximate intangible location characteristics like amenity-related factors. Accordingly, the larger explanatory power of economic factors in the models might be due to the fact that the available statistical data obtain their inter-regional variance more precisely than in the case of amenity-related factors. Thirdly, analyses made use of regionally aggregated data. Accordingly, processes at the micro (individual) level (e.g. gender, age, income, etc.) could be missed, which might be unrelated to regional characteristics. Future research therefore needs to employ data at the individual level, including information on the spatial mobility of artists.

Moreover, the theoretically deduced factors may be insufficient, because they are derived from the human capital theory in general and/or specifically from the creative class literature. The analyses focus on very particular occupations. Thus, other occupation-specific factors might be more relevant to freelance artists. This leads to the last shortcoming. The use of quantitative data might be not sufficient to answer the research question. Qualitative methods could deliver valuable insights into individual behaviour, a topic which is complex and not easily available in quantitative datasets.

Despite these shortcomings, findings have crucial implications for policy makers in general, and particularly for those who are potentially inspired by Florida's ideas for supporting the regional agglomeration of the creative class. Firstly, this concerns the questionable importance of amenities, because they are not found to be associated with any empirical effect on the agglomeration of artists. Secondly, support programmes need to seriously consider the significant differences among the groups of artists. Given the severe heterogeneity within this relatively small sub-group of the creative class, it is doubtful whether suitable policies can be designed for the creative class as a whole (see Sternberg (2012) for a detailed discussion).

Chapter 4

Ich will nicht nach Berlin! – Life course analysis of inter-regional migration behaviour of people from the field of design and advertising

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4.1 Introduction

In 2011 Kraftklub, a young rock band from Chemnitz, Germany, gained considerable attention for their song "Ich will nicht nach Berlin!" (I don't wanna go to Berlin!). Berlin is regarded as the Mecca for creative people in Germany; the downturn of the manufacturing sector and a surge in creative and knowledgeintensive industries since the reunification has attracted talents from Germany and Europe (Ebert and Kunzmann, 2007; Krätke and Taylor, 2004). Additionally, in recent years a lively entrepreneurial environment, which includes institutional financial support programmes as well as an inclination towards entrepreneurial activities backed by strong policy support has developed there (Colomb, 2012; Lange, 2011). Kraftklub's song deals with the popularity of Berlin for young people from creative industries. It scrutinises the hype of the capital city as the location for creative individuals by exaggerating the stereotypical experience of the city. The lyrics ironically describe their commonality of dress, habits and naive career plans and expectations. The song marked the band's breakthrough into the German music scene (SZ-Online, 2012). What could explain the success of the song? Did Kraftklub express what many German creative people are thinking?

There is an ongoing debate about Florida's concept of the creative class. He claims that the spatial concentration of creative people leads to positive regional economic effects and that these people tend to migrate to urban and amenity-rich regions characterised by a climate of tolerance (Florida, 2002a). However, his ideas has raised criticism among the scientific community, which in turn led to a large number of studies that empirically test his ideas (Glaeser, 2005; Markusen, 2006; Peck, 2005; Pratt, 2008; Storper and Scott, 2008; Scott, 2010).

However, one of Florida's main assumptions, the high mobility of creative class members and their location preferences, has so far gained very little attention in the literature. Most studies rely on concentration measures and only few studies use real migration data (Hansen and Niedomysl, 2009). Moreover, the majority of studies are quantitative and deal with 'observed choices' of migrants rather than their intrinsic motivation for locating to a certain place. Only a few studies apply qualitative research methods that address this problem and de-liver in-depth insights into migration decisions (Andersen et al., 2010a; Bennett,

2010; Borén and Young, 2013; Martin-Brelot et al., 2010; Verdich, 2010). However, even these studies seldom have a dynamic perspective (Borén and Young, 2013, except). Thus, this article presents results from a case study in order to fill this gap. Using an innovative research design – the life-history-calendar method (LHC) (Freedman et al., 1988) – in-depth interviews with individuals involved in the design and advertising industry from three different regions in Germany were conducted to shed light on the inter-regional migration motives of this particular occupational group of the creative class. This article analyses a rich and unique dataset of spatial and career trajectories of designers and advertisers to address the questions:

- Why and to where do people from design and advertising move?
- How do migration motives and destinations change over a lifetime?

The results show that people from design and advertising will likely move for different reasons throughout their careers. Social relations, qualifications and employment opportunities as well as self-employment turn out to be the main reasons for a decision to move or stay. There is little evidence that soft location factors as suggested by Florida, such as openness and tolerance, influence migration decisions and destinations. However, the reputation of a city as a 'media city' can influence young professionals towards certain metropolitan regions.

The article is structured as follows. Firstly, the current literature about migration of the creative class in general, as well as bohemians in particular, is reviewed. Next, data and methods are explained. Then, qualitative data derived from the interview material is analysed to provide in-depth insights into the relative importance of migration motivations over a lifetime. Lastly, the results are summarised and policy implications, as well as the need for further research are addressed.

4.2 Migration theory

Migration is a complex phenomenon which involves psychological, individual, socio-economic and geographic factors that influence decision-making and des-

tination choices - resulting in a plethora of theoretical and methodological approaches (Greenwood, 1985).

While the earliest systematic studies of migration can be traced back to Ravenstein (1885), the first theoretical models were developed by neo-classical economists in the 1960s. Their macroeconomic models found that factor mobility was a consequence of differences in relative prices. In cases of migration, differences in wage levels are caused by an uneven distribution of capital and labour. Regions with a scarce supply of labour relative to capital exhibit high wage levels. On the contrary, regions with a high labour-capital ratio have low wage levels. Hence, labour from low wage regions migrate to regions with higher wage levels. In the long run, redistribution of labour results in a convergence of wage levels and migration ceases. Although these models were – and are still – widely used, they suffer from significant shortcomings. The main criticism refers to the assumption of neo-classics in general: such as rational choice, utility maximisation and perfect information. Moreover theses models neglect intervening geographical, political and cultural barriers that hamper migration. Furthermore, the predicted effect of convergence is not observable in reality (Arango, 2000).

An important extension of these models was proposed by Lee (1966). First of all, he defined four strands that influence migration: factors related to origin, factors related to destination, interventionist obstacles and personal factors relating to an individual migrant. He argues that there are push and pull factors related to the regions of origin and destination that attract or repel migrants. Information on these factors is always imperfect. However, migrants are likely to have more solid information about the push and pull factors of the region in which they currently live. Moreover, obstacles like physical distance also have to be taken into account. On the level of the individual factors associated with the stages in a life cycle, such as family size, and factors that are constant over time, such as risk-aversion, affect migration (Lee, 1966).

Besides macroeconomic models, there are models that use the individual as the starting point. The human capital model of migration introduced by Sjaastad (1962), is one such prominent microeconomic model. This model deals with individual's return on investment from migration, rather than aggregated migration flows due to income differences. Thus migration can be seen as an investment in human capital with costs and gains. The costs of migration can be divided into monetary and non-monetary costs. Monetary costs for instance relate to relocation and the likely higher cost of living in the destination region. Non-monetary costs – psychic or opportunity costs – are likely to be more influential than monetary costs. The former relate to the cost of leaving family, friends and familiar surroundings. The latter can be costs associated with job searches or learning new skills that fit the industrial structure of the region of destination (Sjaastad, 1962).

Analogous to costs, there are monetary and non-monetary returns from migration. Non-monetary returns might stem from location preferences; for instance, the benefits from amenity consumption. Monetary returns of migration derive from earning differences. However, these depend on variables such as occupation, age and gender. Migrants have to compare their earnings within their peer group, keeping occupation, age and gender in mind (Sjaastad, 1962).

There is an overarching paradigm of migration research that studies the dynamics of individual careers and their connection to geographical movements. Life course events are acknowledged as important factors in migration. Research on the role of the life course on migration can be traced back to the 1920s. However, the roots of its current form stem from the 1960s, when new theories, data and methods were developed. Recent studies on life course and migration are mainly interested in changes in education, occupation and family in order to explain movements to other regions or countries (Kulu and Milewski, 2007; a.V. Clark and Davies Withers, 2007)

Niedomysl (2010) acknowledges that the attractiveness of a place will vary over a lifetime because of different needs, demands and preferences within the different life course stages. For example, students will be concerned with qualifications, so regions with universities will be more attractive. The choice of their study matter as well and will further narrow the number of destinations (Niedomysl, 2010).

Young professionals tend to migrate towards regions with good job opportunities and vibrant labour markets. Highly educated couples in particular value opportunities to find jobs in the same region (Chen and Rosenthal, 2008; Costa and Kahn, 2000). It is also noticeable that young professionals tend to migrate from regions of lower to regions of higher urban hierarchy (Plane et al., 2005). Marriage and the establishment of a family have a profound impact on the decision to migrate and on a likely destination. The size of a family is a decisive factor. The bigger the family, the less likely it will move because higher economic costs, and wider social ties tend to constrain migration. Moreover, the choice of destination alters according to family size. The more children, the bigger the likelihood a family will move to a rural area and vice versa. The birth of a first child provides parents with the impetus to locate to a more family friendly environment. This is also associated with housing consumption. However, most of these movements take place within a distinct labour market region (Kulu and Milewski, 2007; Wall et al., 2013; Clark and Huang, 2003)

In the US, the mid-career population disproportionately prefers regions of lower urban hierarchy over major and mega-metropolitan regions leaving them (Plane et al., 2005).

In summary, the migration process is shaped by push and pull factors in the region of origin and destination and by obstacles, which result in costs and returns from migration. Moreover, the individual level is decisive. It determines resources like income and defines the costs by looking through the prism of social relations and learning a new job as well as influence opportunities for returns through occupation, education, age and gender. It also affects the perception of push and pull factors. Altogether, migration is caused by dissatisfaction of one's current situation and location and the perceived future net benefits of migration to another region. Moreover, life course events are significant determinants of migration and the likely location because of the different needs, demands and preferences in each life course stage. Thus, a life course approach is also essential to understand the migration of creative people.

4.3 Migration of the creative class

Florida's key idea of is that talents are highly mobile and willing to exploit creativity in all aspects of their life (Florida, 2002a). Thus they are attracted by places that foster their creativity. These places are characterised by intense social and cultural interaction (Wojan et al., 2007b).

The empirical literature mostly analyses the spatial concentration of the cre-

ative class and implicitly on migration behaviour. However, concentration measures cannot distinguish between factors that affect either endogenous or exogenous growth caused by migration (Hansen and Niedomysl, 2009).

Migration motives can partly be identified by the analysis of the shift in regional concentration. McGranahan and Wojan (2007) analyse the change in the employment rates of the creative class in the US. They find that in rural regions natural and outdoor amenities and education opportunities foster the employment rates of the creative class. With respect to urbanity, the results are ambiguous. The relation to population density follows an inverted u-shaped pattern; it is only positively correlated up to a certain threshold. Thus, a growth of the employment rate can be observed mostly in moderately populated suburbs. Moreover, the authors suspect that life cycle migration is relevant, because creative employees in rural regions are older and more likely to be married. This indicates that family-friendliness seem to be an overlooked factor that could attract creative class members (McGranahan and Wojan, 2007).

Drawing on survey data of high-skilled migrants, Niedomysl and Hansen (2010) showed employment prospects were the most important factors in migration decision-making. Furthermore, in another article they provide empirical evidence for Sweden that the creative class is only marginally more mobile compared to the rest of the population²⁶ and that they most frequently move after finishing university to find a job (Niedomysl and Hansen, 2010). Moreover, Niedomysl (2008) reveals that the relevance of migration motivation varies depending on the spatial unit of analysis. With regard to inter-regional migration, social relations and occupational factors are most relevant. Amenities seem to play a role when it comes to intra-regional migration and migration between neighbourhoods.

Scott's (2010) analysis of migration data of engineers in the US stresses the importance of job opportunities and the compatibility of a migrant's skills with the local industry structure.

The ACRE²⁷ research project analyses the migration motives of creative people from 13 cities across the EU. The results from their survey point to the ut-

²⁶ The rate is 4.0% for highly and 2.8% for low qualified people. However, from the author's point of view, it can be questioned, if these rates are only marginally different.

²⁷ Accommodating Creative Knowledge – Competitiveness of European Metropolitan Regions within the Enlarged Union, see http://acre.socsci.uva.nl for details

most importance of social ties. However, participants from Germany (Munich and Leipzig) rank hard location factors more often at first place. Amenities seem secondary, especially cultural amenities. Only in Amsterdam were they ranked relatively high (26% in Amsterdam compared to 8% in total). But, social ties and hard factors are also more important for participants from Amsterdam (Martin-Brelot et al., 2010; Musterd and Murie, 2010). Case studies from Ireland and Scotland again illustrate that job opportunities and social relations are dominant in migration decisions and destination choices (Boyle, 2006; Houston et al., 2008).

Moreover, amenities or quality of life are perceived differently depending on the region people live in and their current life phase. For instance, Verdich (2010) shows that creative class members in Launceston, Tasmania, value smallness and rurality and are put off by dense and hectic cities. Moreover, the effect differs depending on the size of the city. The effect of amenities hold true for larger cities in the main (Andersen et al., 2010b). Andersen et al. (2010a) demonstrate that amenities highlighted by Florida might be relevant to young singles, but families have different demands and thus are attracted to more rural and family-friendly environments (Andersen et al., 2010a).

Grant and Kronstal (2010) interviewed creative class members in Halifax, Canada. They found that depending on the occupational background, people had different motivations to move to, stay in or leave Halifax. People from health research mainly came there for a job. Other attractors are the universities and hospitals. Moreover, they highlighted the natural environment and the lively art and cultural scene as attractive. Workers from the consulting field came to study in Halifax or for job reasons. They also mentioned the natural beauty as an amenity. Musicians were attracted by a collaborative and active music scene. The environment in Halifax is less competitive compared to Toronto, Vancouver and Montréal. Especially, the high number of students is a decisive demand factor. Overall, people appreciate the manageable size of the city that offers spatial and social proximity within a professional work environment. The lack of ethnic diversity and tolerance seems not to be perceived as a crucial disadvantage. However, the relative small size of the city leads to a limited market and career opportunities, forcing some workers to look outside the region for career prospects (Grant and Kronstal, 2010).

Another case study of Canada looks at the peripheral region of Newfoundland and its province capital St. John's. In this relative small and disconnected city amenities did not play a role, neither to attract nor to retain creative people. Hard factors like salaries and taxes were mentioned, instead. The study questions the relevance of Florida's concept for rural and remote regions in general (Lepawsky et al., 2010).

There are only a few studies that explicitly address the migration of bohemians, which is of particular interest for this chapter. Alfken et al. (2015) focus on regional growth rates of freelance artists in Germany to describe the dynamics of the agglomeration of creative occupations. The authors show that urbanity in particular and the initial concentration of artists in a region both have an impact on subsequent growth rate of artists' population.

Faggian et al. (2014) analyse the migration behaviour of bohemian graduates. They distinguish between five types of migrants: repeat, return and late migrants as well as university stayers and non-migrants. Compared to other graduates, bohemian graduates are most likely to stay in the university region or return to their home region (even most likely to return to their parental domicile). Moreover, they are less likely to become repeat or late migrants. Strikingly, the latter are the most successful in the labour market in terms of their entry salary. The authors conclude that bohemian graduates have difficulties to enter the job market and that migration is not a strategy to maximise their income, but to capitalise on existing networks in order to reduce the risk of failure on the job market (Faggian et al., 2014).

In a case study of artists from Stockholm, Borén and Young (2013) reveal that "...artists are not simply footloose individuals who can choose to live anywhere." (Borén and Young, 2013, p. 202). Their findings suggest that the migration decision of artists is shaped by the interplay of push and pull factors in combination with life cycle stages. They highlight the role of job opportunities and higher education institutes to attract artists to Stockholm. Moreover, social relations and networks influence their mobility. Mobility is less likely to occur if artists have started a family and already established a professional network. Among the regional factors, city size and thus the market demand is pointed out. Most artists are sceptical about policy interventions. However, public or private grants for their

work allow for international mobility (Borén and Young, 2013).

Another case study on migration of artists again demonstrates the importance of job opportunities. Artists from Western Australia are forced to leave smaller communities to migrate to metropolitan regions, because of a greater audience, thus a higher market demand for their work. Moreover, mobility of artists is influenced by social relations like family and friends (Bennett, 2010).

Markusen and Johnson (2006) confirm the role of life cycle stages. They found that young artist concentrate in city centres, because of education opportunities and a vital creative milieu. On the contrary, older artists move to the suburbs for reasons of lower living costs, family planning and outdoor amenities (Markusen and Johnson, 2006).

Dellbrüge and de Moll (2006) interviewed international artists, who migrated to Berlin. These artists listed low living costs, the reputation gain of being an artist from Berlin and the vital exchange of ideas within the artistic community and an open audience as key advantages of Berlin (Dellbrüge and de Moll, 2006).

In conclusion, most studies point to the fact that hard location factors such as job or qualification opportunities are most relevant. Even studies dealing with the migration of bohemians reveal that soft location factors are not as important as Florida suggests. If at all, amenities only seem to play a role in the national context of the US or on the level of intra-regional mobility. Surveys and qualitative research highlight the fact that social relations (personnel and professional networks) are significant in shaping migration decisions. Moreover, preferences and migration behaviour vary with the occupational background. However, there only a few studies analysing one occupational group in-depth and these studies seldom have a dynamic perspective.

4.4 Data

Florida introduced the creative class as an alternative measure for human capital. Members of the creative class "...add economic value through their creativity" (Florida, 2002a, p. 68) and "...engage in complex problem-solving that involves a great deal of independent judgement and requires high levels of education or human capital" (Florida, 2002a, p. 8). The creative class consists of the

4.4 Data

so-called core and professionals. Members of the core are scientists, engineers, university professors, artists, designers etc. Professionals work in knowledgeintensive industries, financial and legal services, healthcare and business management (Florida, 2002a). However, the most creative group are the bohemians, as they are culturally or artistically creative and often work in creative industries. They belong to occupations like artists, musicians, writers, models and designers (Florida, 2002b).

The chapter focuses on designers and advertisers. These occupations are part of Florida's creative core and belong to the bohemians, thus they are members of the most creative of occupations Alfken (2014). Moreover, the rationale behind the emphasis on a particular subsector or occupation is twofold. Firstly, creativity is a prerequisite and the essential factor for products and services of creative industries. If there are locations that are conducive to creativity, theses occupations should benefit the most. Moreover, the occupational field is marked by a high rate of self-employment making it easier to choose a location and be more footloose (Wojan et al., 2007b). Indeed, Florida's creative class originated in the analysis of bohemians and cultural creative individuals (Florida, 2002b). Consequently, if the mechanisms claimed by Florida are at work, one should most likely observe them in case of bohemians (Wojan et al., 2007b).

Secondly, the limitation of the investigation to the field of design and advertising leads to less biased and clearer results than the analysis of the whole fuzzy and diverse creative class. As Markusen puts it: "To the extent that creativity is embedded in workers who make independent location decisions, which is plausible, it is best studied occupation by occupation." (Markusen, 2006, p. 1922). Additionally, there is a general trend to concentrate on specific occupations or industries. Especially, creative industries received increasing attention since the 1990s from scientists and policy makers. This resulted in research on creative industries in general (Caves, 2003; Scott, 1997) and its specific subsector like the film industry (Scott, 2004), fashion (Rantisi and Leslie, 2006), advertising (Grabher, 2001, 2002), to name a few. The increased interest in the creative sector has to do with its rapid expansion in terms of employment and turn over (Mossig, 2011). In addition, the creative industries have an important role for innovation in other sectors through the increasing importance of aesthetic and symbolic val-

		companies		employees		turnover (mio.)	
		abs.	rel.	abs.	rel.	abs.	rel.
Design	Lower Saxony	3,234	19.0%	4,973	10.4%	825	10.9%
Design	Germany	55,729	22.4%	141,544	12.4%	18,931	13.0%
۸. <u>ا</u> مریک	Lower Saxony	2,487	14.6%	6,916	14.4%	1,029	13.7%
Advertising	Germany	32,722	13.2%	212,372	18.6%	24,890	17.1%
CI	Lower Saxony	17,026		47,884		7,538	
CI	Germany	248,271		1,143,378		145,285	
Source, DMUE (2012), Söndermann (2014)							

Table 4.1: Relevance of design and advertising within creative industries

Source:BMWi (2013); Söndermann (2014)

ues as well as bohemian lifestyles into mainstream economy and society (Lash and Urry, 2002). Furthermore, policies regarding the support of creative individuals or companies in Germany (and other European countries) mainly aim at the creative industries (Mossig, 2011). Thus, this study focuses on individuals from design and advertising and thus can form a bridge between the literature in the US that concerned with the creative class and the debate on the creative industries centred in Europe and Germany (Comunian et al., 2010).

Why design and advertising? Especially, bohemians have the potential to generate 'spill-acrosses' through interaction with more traditional and technologyoriented companies. They can "accelerate human capital externalities and knowledge spill-overs" by "the spread of new ideas and knowledge transfer across firms and industries" (Florida et al., 2008, p. 621). Above all, design and advertising companies cooperate with companies from other sectors to develop new products, brands or increases sales through improved communication and advertising.

Moreover, design and advertising are important sub-markets of the creative industries as they constitute a large share of companies, employment and turnover of the sector. Together both branches account for over 30% of all companies, employees and turnover in Germany (see Table 4.1).

The research is funded by the Ministry for Science and Culture of Lower Saxony and a motivation for the regional focus of the empirical investigation. Moreover, design and advertising are also important sub-markets of the creative industries in Lower Saxony. In sum they account for 33.5% of all companies from the creative industries. However, the share of employees (24.8%) and turnover



Figure 4.1: Creative hubs vs case study regions



(24.6%) is lower compared to the German average.

Interviews were therefore conducted in the planning regions Hanover, Osnabrück and Göttingen. They are three of the most populated regions in Lower Saxony, which implies a certain degree of urbanity in Florida's sense. More importantly, these cities are sufficiently similar to be comparable, because they all possess higher education organisations like universities and universities with applied science curricula and have a critical mass of creative industries.

By comparing the case study regions of this study with the creative hubs in Germany, it becomes obvious that the study regions fall far back behind. Hanover's regional share of employees in creative industries corresponds to the Germany average, but the share is only half as high as in Hamburg for instance. Osnabrück and Göttingen score even considerably lower than Hanover. The share of Göttingen is only about one-fifth of Munich, which has the highest share. Altogether, the case study regions belong at best to the league of second-tier cities in terms of the relevance of creative industries for the regional labour market (see Figure 4.1).

Nevertheless, Hanover holds a key role for creative industries in Lower Saxony. It accounts for nearly one-third of the turnover and labour force of creative industries in Lower Saxony. With a 2.7% turnover and 4% of the total workforce²⁸ of all sectors in Hanover, creative industries score above the average of Lower Saxony (1.5%; 2.4%). Compared to Germany the relevance of the sub-sectors design and advertising are disproportional high (Arndt et al., 2014).

Likewise, Göttingen's creative industry is characterized by an average share of the regional turnover (2.9%) and workforce (3.6%). The most important submarket of the creative industries is publishing. Design and advertising are less important (ICG, 2011).

With 11.7% of all companies from the creative industries in Osnabrück, the sector is more important compared to the German average of 7.6%. The submarket of design makes up 16.9% of all companies from creative industries, which is similar to the German average (17.3%). Advertising is the most important submarket with 27.7% of companies and scores disproportionally high compared to the German average of 12.2% (IHK, 2014).

In conclusion, the chapter focuses on individuals from design and advertising, both belonging to the creative class and part of the creative industries, thus bridges the two streams of literature. Design and advertising are identified as important sub-markets for creative industries in Germany. However, their contribution in terms of companies, employment and turnover varies considering the case study regions. Moreover, none of the case study regions play in the same league of creative hubs like Berlin, but represent second-tier cities. However, there are ambitions and policies in these regions that support cultural and creative industries as well as attract and retain talents.

²⁸ Employees and self-employed

4.5 Methodology

Analyses are based on a mixed-methods case study consisting of an online survey and in-depth interviews with individuals from the design and advertising field in three cities in Lower Saxony.

The online survey provides a general overview of the extent of migration and the main motives. It was sent to all managers and founders of design and advertising companies in the three regions. Addresses were gathered with the help of local economic promotion agencies and were supplemented by online searches in social media and business directories. In total, 818 addresses were collected. The online survey was filled out by 244²⁹ entrepreneurs at a response rate of 30 %. Among other topics, entrepreneurs were asked about their birthplace, and when and why they moved to the current region.

Qualitative methods were applied because they are best suited to answer 'why' and 'how' questions. Therefore, they are useful when motivations and processes are of interest (Yin, 2009). Case studies can establish causal inference by using within-case process tracing and cross-case comparison. Detailed knowledge about cases and processes allows the establishment of a link between cause and effect. Moreover, studying several cases ensures the reliability of the results. Another advantage is the holistic view that allows the identification of 'left-out variables' or more detailed nuances of a variable. Furthermore, a holistic view addresses the interaction effects between variables prevalent in complex social reality (Bennett and Elman, 2006a,b).

Qualitative data is derived from 58 semi-structured interviews³⁰ with individuals (entrepreneurs and employees) from the fields of design and advertising. Interviewees were selected on the basis of the 244 participants of the online survey. They were conducted between July and November 2013. The interviews were of up to 150 minutes in length. The topics of the interviews included:

- The career path
- Inter and intra-regional mobility

²⁹ Hanover: 166; Osnabrück: 49; Göttingen: 29

³⁰ Hanover: 36; Osnabrück: 15; Göttingen: 7

• The establishment and development of their businesses

Even though our interviewees lived in one of the case study regions at the time of the interviews, most of them had been mobile in the past and resided in other regions in Germany. Moreover, the longitudinal character of the interview covers different age and career stages. During their career, interviewees worked at small or larger companies, were unemployed, were self-employed or started their own business. Hence, the data has a panel-like structure with several observations per case. Consequently, information is included on migration decisions and destination choices of individuals from different genders, ages, career and regional contexts. However, the 'sample' is not representative in a statistical sense. The purpose of the interviews was to obtain in-depth insights into the mobility of creative people. Results of the analysis might be biased, particularly because of the regional and occupational background of interviewees. Therefore, results are compared to findings from other studies to overcome this potential problem.

To obtain the career paths and the mobility patterns of interviewees, the LHC method was adopted. LHC is a tool for gathering retrospective data from interviews while avoiding memory bias. The method uses a calendar as a visual cue and records important life events in the history of individuals to support the recollection of past events (Freedman et al., 1988; Harris and Parisi, 2007).

In the first phase of the interview, the interviewees and the interviewer simultaneously compile the calendar. Important dates in life such as the date of birth, high school graduation, university enrolment and graduation, career changes and the time of starting a business are entered. In a next step, these anchor dates are used to identify what happened and where interviewees lived at the time of and between these events. Next, interviewees were asked about the motives for their behaviour: Why did they choose a certain university, apply for a new job or move to another region? Hence, we know where and why they lived at certain times.

The interviewees were asked to state their main reason for migration, then to list other reasons, motives and alternative destinations that may have been considered. Thus, we are able to rank motives relative to their importance. The description of the decision-making process further ensures reliability of the stated intrinsic motivation for migration. Another advantage of the data is its longitudinal nature, which allows us to obtain an individual's changes in preferences over a life time. We used a 50 km radius as proxy for administrative boundaries, because participants are not familiar with exact definition of administrative unities. Thus participants were asked to relate statements on regions to the city centre plus a 50 km perimeter.

All interviews were recorded and transcribed. NVivo 9 was used to provide qualitative content analysis. First, transcripts were coded into categories according to the motives deductively derived from the literature. Motives for interregional migration were roughly distinguished between qualifications, jobs, social relations and soft location factors. New sub-categories were obtained throughout the coding process from the text representing nuances or the particular qualities of a category. Other categories were dropped because they were considered to be irrelevant. Hence, in a second iteration, inductively derived categories were added and categories recoded. Iteration was stopped when all of the textual passages were coded and the categories remained 'stable'. Thus, the qualitative content analysis ended up as the final coding scheme illustrated in Table A.10 (Kuckartz, 2012; Schreier, 2012).

In addition, text passages were organised into three categories reflecting stages in the life course: student, young professional and (established) professional. The 'student' stage comprised all texts concerned with the phase after high school graduation and before a first job or self-employment. The second phase relates to the time after university or apprenticeship and the end of a first job or selfemployment. The last stage comprises the time as an established professional or entrepreneur. These interviewees had already gained substantial experience in their chosen field, which is mostly indicated by job changes or career steps. 'Crosscutting' life stages and motives allowed analysing the interdependency of spatial and career trajectories.

4.6 Changing relevance of motives for inter-regional migration

4.6.1 General overview of the extent and motives for migration

The results from the online survey are assessed in order to ascertain a general overview of the extent and dominating motives of inter-regional migration.

The numbers show that an average of 37.7% (Hanover 37.4%; Göttingen 34.5%; Osnabrück 40.4%) of the participants remain in the city where they were born. Thus, 62.3 % (Hanover 62.6%; Göttingen 65.5%; Osnabrück 59.6%) were born outside. Looking at the map³¹ in Figure 4.2, it is obvious most of the participants are from neighbouring cities. Many of the participants even originate from cities within the same planning region³². The rate is largest for Osnabrück with 39.2% of all creative immigrants born within the same region (Hanover 14.7%, Göttingen 21.1%).

The rate even increases, if one refers to a 50 km radius instead of administrative boundaries. In Hanover 34.3%, in Göttingen 50.0% and in Osnabrück 69.2% were born in the city centre or in a city within a 50 km radius.

Regarding federal states, the majority originate in northwest Germany (Lower Saxony, Hamburg and Bremen) and the northern parts of North Rhine-Westphalia. Only a few came from South or East Germany. Seven participants were born abroad. Thus, based on these figures, more than half of the participants were mobile in the past, but they moved for only relatively short distances.

Figure 4.3 gives first indications of the motives for migration. It shows the age when participants moved to their current region. There are peaks in the distribution when participants are in their early 20s and in their late 20s to mid-30s. These results suggest that people are especially mobile when they leave school and enter university or when they finish university and are looking for their first job.

³¹ Links do not necessarily represent actual migration flows. Other destinations between birth place and the current place of residence are possible.

³² German planning regions (Raumordnungsregionen) are spatial entities of functional regions that aggregate urban cores with their hinterland based on economic relations like commuting (BBSR, 2012b).





Source: own online survey



Figure 4.3: Age when moved to region (n = 244)



With regard to motives³³ for migration, participants were asked to choose the three most important reasons for moving to their current region (see Figure 4.4).

The most important motives were social reasons. In total, these were relevant to about 51.4% of all participants. Moreover, education (30.0%) and job-related motives (28.6%) are of high relevance. Openness and tolerance put forward by Florida comprise only 4.3%. Other soft location factors that seem to be more important include urbanity (16.4%), housing (12.9%) and recreation opportunities (12.1%).

In Figure 4.5 participants are grouped into migration categories³⁴, based on the age when they moved to one of the case study regions. It becomes obvious that the relevance of motives varies considerably over a lifetime. The main motive for participants between the ages of 18 and up to 25 are education-related motives. Moreover, social relations, job opportunities and urbanity are considerably

³³ The online survey stated 18 motives and one open category. These were aggregated as follows: social (friends; family; partner / spouse), education (study / apprenticeship), job (new job; looking for a job; self-employment), urbanity (urbanity; good travel; connections; image of the region), housing (availability of housing; affordable housing; fondness for children), recreation (appealing landscape; good recreation and leisure opportunities; variety of cultural supply), openness (open and tolerant climate, creative milieu)

³⁴ Education migrants: between the ages of 18 and 25 years; job migrants: between the ages of 25 and 30; family migrants: under 18 or between the ages of 30 and 50 (Flothmann, 1993).



Figure 4.4: Motives of migration (percentages of cases) (n = 244)

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Source: own online survey
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Figure 4.5: Motives by migrant age group (percentages of cases) (n = 244)





important. Particularly participants between the ages of 25 and 30 move to find a job. However, social relations even play a more dominate role in the migration decision. Social reasons are clearly the most relevant motivation for the family migrants. Additionally, job-related motives are important. According to a Fisher exact test of independences, only the differences between the motives 'social', 'education' and 'job' are statically significant at the five percent level.



Figure 4.6: Motives by region (percentages of cases) (n = 244)

Source: own online survey

In migration literature the characteristics of a places are considered to be important determinants for migration decision (Greenwood, 1997). Table 4.2 shows some basic figures of the three case study regions. Statistically these regions differ with respect to the relevance of cultural and creative industries, population size and its dynamics, the share of students, net migration and economic performance.

Figure 4.6 reveals the migration motives depending on the participants' current region. It indicates that there are differences considering social relations, education and job as motives. However, these differences, as all others, are not statistically significant at the five percent level. In addition, the interviews yield no obvious differences in migration motives between the three regions. Thus, the influence of life stages seems more important and will be analysed in-depth in the following chapter.

le 4.2: Characteristics of case study regions	ts Net Migra- Unem- GDP per tion rate (1,000)	4.3 8.3 33.7	-0.9 7.6 27.2	3.6 5.0 29.8	- 5.9 30.5	
	Studen per 1,000 inhab.	26.5	54.0	35.6	31.3	112a)
	Pop. Growth (2006 – 11)	-0.1	-3.6	0.3	-0.8	ce: BBSR (20
	Population	1,417,925	544,617	657,505	82314900	Sour
Tal	Share of employ- ees in cultural and creative industries	3.3	1.6	1.8	2.7	
	Planning region	Hannover	Göttingen	Osnabrück	Germany	

4.6.2 In-depth insights from the interviews

The first stage is called 'student'. It begins after finishing school when individuals first make their own choices about their career and where they want to live. This stage is dominated by qualification as a pull factor. First and foremost, students or apprentices are concerned with the choice of an occupation or a subject of study. This leads to the decision about where they want to live. However, a major obstacle is the distance from social relations or the psychological cost of leaving their home region. Most interviewees searched in close proximity to the parental domicile; sometimes for practical reasons such as a lack of financial resources in order to live independently and sometimes because of their attachment to family, parents and friends.

"I am from the North. And there weren't so many options at these times. The term 'graphic design' was still not as common as today. I think Bremen, Hildesheim and Hanover were the places to go. Or Hamburg. I didn't want to be too far away from my roots. It was really only by chance that two guys I knew from Wilhelmshaven wanted to study there, too." (12)

"And then of course there were financial reasons. My salary as a trainee was not very high... of course it made sense, I could stay and live at home." (5)

Social relations not only shape an individual's search scope; they often determine spatial inertia.

"In principle, there was no alternative for me, because I am - both then and now - very well embedded here - through friendships. These friendships from school, normally cease if you go somewhere else; but they still exist and some of us are business partners today." (2)

In addition, social relations can become a form of locally bound social capital. It is only valuable if individuals remain in a certain region to exploit existing networks.

"My mother and brother already had extremely good networks in the city. To be honest I, wanted to make use of them. If I had gone to another city, I would have had to start from zero." (26)

In the case of design students the application process for university is another obstacle. Candidates have to prepare a portfolio of their artwork for the application process. Normally, they only have the time and resources to prepare a limited number of portfolios. Thus, in practical terms, the number of universities they can apply to is limited.

"You have to narrow [it down] because you need an individual portfolio for each application. If one manages to prepare three portfolios, which are always submitted at the same time, and they don't look like a kind of copy of one other, you have to limit yourself. I sent portfolios to Hamburg, Darmstadt, Hanover and Brunswick: they were sent at the same time, and more than four portfolios wasn't feasible." (9)

If candidates were successful and had more than one option, they were more concerned with the quality of the university than with the city in which the university was located.

"And since the course in Wuppertal was relatively new, I thought that they should have the best equipment. And I got a commitment from Wuppertal for printing and media technology, so it was clear to me that I wanted to go to the most modern location." (20)

"It was important for me to find a university that is excellent in the field and has first-class professors. So in Dusseldorf, for example, for photography, film, print, there are a lot of different facilities or workshops, for wood and metal crafting. They are well equipped. This is not the case in many other universities, simply because the money is not there." (21)

Push factors were rarely mentioned. However, the availability of a desirable university program or the presence of companies from the field of design and advertising were necessary prerequisites to start a career in a creative field. The second life course stage is the 'young professional' stage. This starts with the end of university or apprenticeship and covers the first job or self-employment phase. As Hansen and Niedomysl (2009) reveal, this is a stage of high mobility. Employees in their early career phase depend mainly on the availability of jobs, which is then the major pull factor to another region.

"So I made quite a few applications. I've been in Hamburg, also in Cologne, for job interviews. But it didn't work out. And then it was, I would say, the fifth application or so, when I got my first job." (5)

The majority of interviewees that completed an apprenticeship had the chance to stay on at the company that had invested in their qualifications. Thus, these interviewees had little reason to think about changing a company, let alone move to another region. In-house career opportunities therefore often determine the levels of spatial inertia. The quality of the actual job was also relevant. On the one hand, the quality of the job and career opportunities in the current job was the main reason for remaining in a company and therefore in a particular region. On the other hand, if a better quality job came up elsewhere they might decide to move.

"It was exciting concerning the profile; it was a big company offering many opportunities, just after finishing university." (1)

"And then I started my career in the company. Firstly, you become a junior consultant, then a junior contact man, then a senior contact man and so on ..." (26)

When it came to deciding where to look for a job, the interviewees either searched within their current region or in regions regarded as 'media cities'. Thus, the reputation of a region is an influential pull factor.

"There were job interviews in Hanover, Cologne, Frankfurt. So, regarding media cities, I would say. Frankfurt is a traditional advertising city; Cologne a media city." (3)

"In the 80s/90s there were two major centres for advertising agencies: Hamburg and Frankfurt." (17) "There are many agencies in Hamburg and there is such a big market. Hanover, because I've lived here and I could imagine staying here. Cologne, because my girlfriend at the time had a prospect of a job there." (5)

However, again social relations are important in shaping the mobility of interviewees. Some interviewees said they moved because of their partner or family. Others decided to stay in the region or commute, because of their social relations.

"Actually I wanted to move to Berlin - this was my plan while still studying. But all my friends are here and at some point that was more important than the professional career." (11)

"This had to do with my former partner, my ex-wife, she is a textile designer. We met in Hanover and she had a job offer in Stuttgart. That was very interesting to her, for a textile designer, just like fashion design, which – then as well as today - is unprofitable art. I still studied in Oldenburg. If you wanted to meet each other from time to time, Oldenburg - Stuttgart is a long way. I then decided to look for a job in southern Germany. I then applied in Stuttgart." (10)

For those interviewees who were in a relationship at that stage, it was important for both partners to have job opportunities in the desired region.

Self-employment or starting a business could be a reason not to migrate. There are interviewees that decided against a job outside the region and to become self-employed in order to stay close to family and friends. Others moved to another region and then become self-employed, because their business is independent of a location and they could be near their social relations.

"The company we mainly depended on declared bankruptcy... Both of us have our family and social roots in North Germany. She in Oldenburg, me in Brunswick. Moreover, many contacts from university still were here. We then thought: 'Okay let's return to Hanover'." (9)

However, for the majority, self-employment is a reason to stay. Self-employed individuals and entrepreneurs normally stay in the region to exploit already established business relations.
"We were actually well-connected and already had customers here. It really wasn't an alternative to go to a different region. If you leave out closeness to the family and only assume location factors, it is because the network, the target group is here." (6)

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The last stage 'professional' relates to the time when an entrepreneur or employee has become established. According to Hansen and Niedomysl (2009) the frequency of intra-regional moves is comparatively low. Most interviewees who had a good job or had already established a company saw little reason to leave the region.

The relevance of social relations is higher compared to the young professional stage. A couple of interviewees used to commute on a weekly or daily basis when they were young professionals; however preferences mostly shifted towards being near family and partners. This became stronger following the birth of a first child.

"It was this situation of commuting to my family from Berlin. I thought I can't bear it any longer. Thus, there was the decision: I had to find a job near Göttingen or find a job with career prospects and the whole family moves. But then, it was a happy coincidence that there was a job ad for a Hanoverian agency." (1)

Interviewees were even willing to relegate their career opportunities and forego attractive job opportunities.

"And in the evaluation or assessment of the three sites, I made my decision dependent upon the travel time to my family... Even though the agency would have been extremely attractive and the owner had called me repeatedly to try to convince me." (1)

In general the search for new jobs is limited to the current region or a short commute.

"...more or less all [my jobs were] in Hanover or at least within commuting distance, since I had a family with three children, in school or just before." (14) "I had my apartment here, I had my friends here. And looking for a job in all of Germany was out of the question. So, I just looked for what was available here on the spot." (25)

At this stage of life the quality of the job and career opportunities are more important than the mere availability. Being unsatisfied with the current job could be a motivation to look for another one. Also, people gained experience, built a reputation and gathered a network of professional relations which sometimes led to them being head-hunted by other companies. Thus, the quality of jobs in another region can be a pull factor - or the lack of job prospects in the current region can be a push factor.

"I had been with the company for almost six years. And I wanted to experience something different. There was no progress. There were no opportunities regarding career or salary in the old company." (14)

"There were no prospects in the current company. Very inhumane working hours. Then I decided to quit." (19)

"I've been poached. They knew me. I got to know them during my apprenticeship. It was a relatively large company in Hameln and they were looking for a new art director. They tried to lure me and they succeeded." (5)

Soft location factors were rarely mentioned. Some interviewees who returned after a while to their home region expressed the view they could not become comfortable with the habits or the mentality they had encountered elsewhere. However, these reasons were not the most important ones.

"We've been to Swabia and we didn't become comfortable there. My wife is from the North, too. So, we said: 'Let's go back to Hanover'." (10)

"We are both North German. We didn't feel comfortable in South Germany, didn't like the mentality somehow." (9)

Normally, there is more than one single motive for migration and interviewees often had to adapt their preferences to new circumstances. This is obvious from the following example:

"And then something unexpected happened. One of the art directors, with whom I was working at the agency, came to me and told me that he had teamed up with a fellow and they wanted to quit their old jobs and start something on their own. But, they needed someone else and they wanted me. I then had the option to go to Hamburg or Frankfurt or to start a business...

I had my family here and a bunch of friends. And then, I decided against an international career. Even though, this had always been my plan. But, I chose to stay here, which was small, familiar and friendly...

Moreover, we thought there were no other agencies like ours in Hanover. We saw an opportunity to become big and successful very soon." (23)

4.7 Discussion of results

Due to potential bias through the small sample size of interviewees from a specific occupational background and only three cities, the results are compared to other findings from inter-regional migration research corresponding to the three life stages discussed above.

In the first phase interviewees were concerned with the choice of a qualification. They searched – mostly in the proximity of their home towns – a city which offered their desired qualification. This result is supported Falk and Kratz (2009) who show that students are rather immobile - 78% of all students in Bavaria grew up in the same federal state. When it comes to the choice of a location, the quality of university seems to play a more important role than the region itself. This observation is supported by research on interstate migration of high school graduates to colleges in the US. States with high quality colleges exhibit a positive net migration from high school graduates (Cooke and Boyle, 2011).

In the second stage, the availability of jobs is the major pull factor. Moreover, interviewees expressed the wish to stay near partners and friends. Therefore especially for couples, regions with a large and diverse labour market are attractive (Hansen and Niedomysl, 2009). In the US there is a clear trend that more and more so-called 'power couples' locate in urban metropolitan areas. This phenomenon is mainly explained by the collocation problem of highly qualified couples and to a much lesser extent by higher returns of human capital in urban locations (Costa and Kahn, 2000). Research by Krabel and Flöther (2014) indicates that in Germany about 61% of the students leave their university region after graduation. However, the majority of mobile graduates tend to migrate to neighbouring regions or to return to their home region (Hell et al., 2011). Falk and Kratz (2009) reveal that the percentage of graduates that remain in the university region varies considerably. In regions with sound economic conditions, up to 80% of graduates stay; this number decreases to 40% in less prosperous regions. The likelihood to remain in a region further increases, if graduates were able to establish links to local employers through internships during university or if they became selfemployed (Krabel and Flöther, 2014).

However, the percentage of students who remain in the university region also depends on the type of university and field of study. In Germany, graduates from universities with an applied science curriculum are more likely to stay in the region, even in more rural regions, than those from classical universities. Falk and Kratz (2009) hypothesize that applied universities are better embedded into the local economy and more often cooperate with local companies. Therefore, graduates fit the local labour demand and they could already establish contacts to local companies during their university time. Furthermore, students of engineering, economics and arts are more specialised have to be more mobile compared to those studying other fields. Hence, if there is a good skills match between students and the local labour market, the percentage of 'stayers' increases (Falk and Kratz, 2009). This result for Germany contradicts the findings from Faggian et al. (2014) who show that bohemian graduates in the UK are less mobile compared to graduates from other disciplines. However, the definition of bohemian graduates in the UK and graduates from arts in Germany is not congruent, which makes a comparison of the results difficult.

The reputation of a region also seems to be relevant. Young professionals focus their job search on renowned places that promise an availability of jobs and attractive employers in their occupational field. As in the case of engineers in the US, interviewees seem to migrate "... to locations whose economic structure and job opportunities correspond closely to their particular professional expertise ..." (Scott, 2010, p. 60).

Moreover, the reputation of a region can be a competitive advantage. In creative industries the products and the reputation of a place are often interlinked (Scott, 1997). Thus, designers and advertisers who worked in Berlin, for instance, can capitalise on the positive reputation of Berlin in terms of their career.

In the last stage of their life, the interviewees were rather immobile. The most important motivation for staying is associated with costs. Foremost among these are the psychological cost of leaving social relations. Moreover, opportunity costs arise when interviewees hold senior positions and have good job opportunities in their current company or when they run a successful business on their own. These results are in line with other studies on family migration. The number of household members and the ownership of a house dramatically decreases the likelihood of moving (Kulu and Milewski, 2007). This finding is also supported by results from Sweden. Niedomysl (2008) shows that the relative importance of being near family members rises with age. Moreover, people with children put more emphasis on the proximity to their family. Nivalainen's study on family migration in Finland reveals that the likelihood of moving decreases with age. In addition, children, the ownership of a house and the participation of a spouse in the labour force also tend to lower the probability of migration Nivalainen (2004).

In summary, most of the results of the interviews are consistent with the evidence from other studies on life cycle migration. This indicates the validity and robustness of the results of this study.

4.8 Conclusion

So, why did Kraftclub's song gain such popularity? Supposedly 'creative' and 'hip' locations like Berlin might attract students and young professionals from creative industries. However many of them change their preferences during a

4.8 Conclusion

lifetime and instead favour the proximity to social relations and to good jobs. Moreover, empirical results challenge the importance of amenities for migration in general. Job opportunities and social relations are much more important.

The aim of this chapter was to analyse the relative importance of migration motives for people from the field of design and advertising over their life course. The existing literature on the migration of the creative class fails to adequately address the life course perspective, which is essential to understanding migration decisions and choices of destinations (Mulder and Hooimeijer, 1999). Therefore, migration behaviour and motives during three different life stages were compared: student, young professional and (established) professional stages.

In the first life course stage, obtaining a qualification is the main motive for moving, but the choice of destination is also guided by the wish to stay near family and friends. For young professionals the availability of a job or the opportunity of being self-employed mainly determines the decision to move or stay. Social relations are important, but most interviewees were willing to subordinate these for their careers. In the last stage, social relations play the dominant role. Interviewees started a family, became house owners, established an enterprise or occupied a leading position in a company. Only unemployment or the enticement of a position with very good conditions motivated them to move at this stage. Thus, interviewees have other motives that shape their decisions and choice of destination than Florida suggests. Moreover, preferences change over a lifetime.

When looking for job outside their current place of living, interviewees repeatedly named a number of metropolitan regions: Hamburg, Berlin, Düsseldorf, Cologne and Munich. This might explain the results from most quantitative research that show an association between openness, tolerance and amenities and the concentration of creative occupations for these regions (Florida, 2002a; Clark et al., 2002; Glaeser and Gottlieb, 2006; Mossig, 2011). An abundance of soft location factors is – in fact – a feature of these regions, but the interviewees did not highlight these among the important motivations for migration. Thus, the causality might be the other way around. First, students are attracted to universities and acquired skills and human capital. After graduation they are looking for places with jobs and career prospects in their respective fields. A concentration of creative occupations then leads to an expansion of amenities, because their earnings are high and they are willing to spend money on cultural products and services (Storper and Manville, 2006; Storper and Scott, 2008; Möller and Tubadji, 2009).

Moreover, the reputation of a place in a certain field might be advantageous, because the positive characteristics of a place are projected to individual skills (Scott, 1997).

This case study revealed some implications for policy makers who want to attract creative people. First of all, creative people are most mobile after finishing school and/or university. When it comes to attracting students who are interested in a creative career, the choice of a university is decisive. Universities that offer creative courses and are well-equipped with technical facilities and posses well-regarded professors are likely to attract students interested in a creative career. Moreover, there is a window of opportunity to retain students after university. If there are good job or entrepreneurial opportunities in a region in the respective industry, students will likely stay there.

To attract young professionals from outside the region, it seems to be important to market that region as a place with well-regarded companies and a thriving labour market. However, Niedomysl (2004) could not find evidence on the effect of marketing campaigns on the immigration in municipalities in Sweden.

The results suggest a process involving the matching of skills with industryspecific regional labour markets. Thus certain policies can play an important role as information brokers. Job matching programmes can help to foster the efficiency of information exchange and thus more effectively match labour demand and supply (Storper and Scott, 1995). Moreover, policy makers should develop a holistic strategy. This strategy should involve stakeholders from local companies, higher education organisations and economic promotion agencies. Establishing links between universities and local companies could help to retain graduates in the region and foster knowledge transfer into the local economy. Support of university spin-offs is an accompanying measure of knowledge transfer; and selfemployment constitutes an alternative to dependent employment outside the region. However, it seems advisable to tailor policies towards a specific occupation or industry, rather than trying to attract or support an inhomogeneous group such as the whole creative class.

The aim of the case study was to provide rich insights into individual mobility

4.8 Conclusion

trajectories and decision-making processes with regard to the individual and regional context. Concerning transferability of results from this case study to other contexts, some limitations must be considered. The case study regions are not representative for all German regions. Thus, some of Florida's arguments might be valid for cities like Berlin, Hamburg, Munich. Similarly, in rural regions the absences of urban amenities or education opportunities might be considered a substantial push factor. This study's findings apply primarily to second-tier cities in Germany possessing higher education intuitions. Furthermore, the case study cities constitute a single urban core of the region surrounded by rural regions. This is in stark contrast to the dense and polycentric urban setting in, for instance, the Ruhr area or Rhine-Main area, where the direct competition for talents from neighbouring cities is higher. Moreover, the interviews were limited to people from design and advertising. Thus, results might be biased due to the very specific spatial structure and the distribution of design and advertising companies as well as the university programmes in arts, design and media. Hence, further case studies on different regions and/or occupations can help to provide a more comprehensive picture of the migration of the creative class. Moreover, future research should investigate the relative role played by universities, the reputation and industrial structure in a region as attractor of talents from different occupational backgrounds. Likewise, social relations of migrants should play a more central role regarding research on mobility of the creative class in general.

Chapter 5

Conclusion

5.1 Summary

The economic growth of regions mainly depends on the ability to generate or attract human capital. Recently, the spatial mobility of human capital gained considerable attention by scientists. Above all, Richard Florida and his hypothesis of the "creative class" stimulated a controversial debate within the scientific community. However, his ideas appealed to politicians and practitioners from urban planning and administration. Thus, decision-makers and planners tended to adopt a concept before there was enough empirical verification. This bears the risk of misallocation of public funds in times of scarce governmental resources.

The cumulative dissertation is composed of three scientific publications that dealt with three major shortcomings in the existing literature on the creative class which gained too little attention so far. Therefore, the dissertation concentrated on: (1) the definition of the creative class, (2) the spatial concentration and its dynamics and (3) the inter-regional mobility of creative individuals. Moreover, most studies relate to the context of U.S. regions. Only recently, is there a growing literature that delivers evidence for regions outside the U.S. (Fritsch and Stützer, 2009, 2014; Boschma and Fritsch, 2009; Wedemeier, 2010, 2014; Möller and Tubadji, 2009; Clifton, 2008; Westlund and Calidoni, 2010; Marlet and Van Woerkens, 2007; Marrocu and Paci, 2012a,b; Mossig, 2011). However, there is still a lack of studies for Germany as a whole and of case studies for specific German regions.

5.1 Summary

Chapter 2 addressed the first major shortcoming: the definition of the creative class. Therefore, it presented an alternative approach in order to identify creative individuals. Florida identifies creative individuals based on their occupation. However, this approach was heavily criticised by the scientific community, mainly because there is no objective criterion that qualifies an occupation as creative or not (Glaeser, 2005; Markusen, 2006; Peck, 2005; Scott, 2010). The alternative approach presented in chapter 2 utilized a well-recognized concept from psychology to describe an individual's personality – the five-factor model or big five model. It is based on five basic dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. The dimension of openness describes the creative, innovative, and artistic performance and interests of an individual (McCrae and John, 1992). Thus, it should be a more direct method for identifying creative individuals than the approximation by occupations.

Moreover, the chapter tried to overcome a methodical deficit. Previous studies empirically relied on aggregate regional numbers (e.g. share of creative class). Thus, these results are potentially distorted due to ecological interference fallacy meaning that correlations on a higher level are not identical with the corresponding correlations on a lower level (Robinson, 1950).

Therefore, the analyses in this dissertation are based on multi-level regressions. These models include individual and regional characteristics simultaneously which should reduce the risk of ecological fallacy (Hox, 2010). Individual level variables that are closely related to corresponding regional level characteristics were considered. Thus, if significant correlations on both levels were observed, a causal relationship could have been more confidential presumed. Thereby, the chapter contributes to the creative class literature by using a new approach to identify creative individuals, a more advanced method and unique data. The guiding questions were:

- Which regional characteristics known from the creative class literature shape the geography of creative individuals identified by the psychological approach?
- How do these results differ in comparison to the conventional creative class definition?

To answer these questions, hypotheses from creative class literature were derived and multi-level logistic regressions were applied. Creative individuals defined by their personality and creative class members were compared to the rest of the workforce.

A summary of these results show that there is only little statistical support for the relevance of the creative class hypotheses for creative individuals defined by their personality. Only soft location factors reflecting openness and tolerance are positive and significantly correlated. This relation is also found for creative class members (professionals and bohemians). Moreover, this effect seems not to be caused by self-selection. Creative individuals, professionals and bohemians are less (or not more) likely to be foreign-born or to live in a same-sex relationship, but their regional environment is characterised by significant higher shares of foreigners and/or same-sex marriages.

Regarding regional effects, supportive evidence is found for the conventional approach which is based on occupations. Professionals who on average have a high level of human capital and often work in high-tech sectors seem to contribute to regional innovation activities in terms of patents per inhabitants. Moreover, some overall creative class models show significant correlations with GDP per capita on the regional level. Although most creative class members (except core) and creative individuals identified by the psychological approach are themselves more often entrepreneurs or self-employed, there are no positive correlations with regional entrepreneurial activities. Contrarily, negative effects are found for the new definition and bohemians – both disproportionally engaged in the cultural sector and more often self-employed – indicating that freelance artists are particularly affected by local demand conditions.

Overall, the results revealed a complex interplay of individual creativity, human capital, entrepreneurial activities, and the occupational as well as regional context. However, due to the static nature of the analyses, the direction of causality remains unclear. Creative individuals are unevenly distributed across occupations and indeed, Florida's creative class is more creative than the rest of the workforce. Individual characteristics such as human capital and entrepreneurial activities are catalysed by the occupational context. While bohemians are the most creative members of the creative class, they earn less. On the contrary, pro-

5.1 Summary

fessionals and core members can capitalise on their creativity in terms of personal income. Moreover, professionals seem to contribute to regional prosperity via innovation activities. Concerning the alternative definition, creative individuals defined by their personality are most similar to bohemians.

Chapter 3 took into account some of the results and limitations of Chapter 2. Due to the high heterogeneity of creative class members and the unavailability of large datasets on personality traits, analyses were limited to the most creative part: bohemians. Moreover, bohemians are the most relevant group concerning German regional policies that aim at creative individuals.

The chapter dealt with the second major shortcoming: the lack of a dynamic perspective in existing empirical studies. It contributes to the ongoing debate on what regional factors make a region attractive for the creative class. In order to avoid the problematic definition of the creative class, analyses focused on the spatial distribution of freelance artists and the temporal change, by using quantile regression and panel data on 412 German districts.

The chapter contributes to the creative class literature by overcoming some of its shortcomings. First, in contrast to most existing studies, the analyses consider the dynamics of the spatial agglomeration, which better identifies the diachronic nature of causal relations.

Secondly, it focuses on one sub-group of the creative class, namely artists, who are are divided into four subgroups: visual artists, performing artists, musicians and writers. This allows for sounder theoretical discussions and empirical investigations of the spatial distribution and the spatial dynamics of creative people and avoids the fuzzy definition of the creative class.

Thirdly, besides the factors put forward by Florida (e.g. amenities, openness and tolerance), a broad array of economic factors that are known to influence the mobility and growth of human capital is considered.

The chapter focused on the following four questions:

- How are artists distributed across German regions?
- How does their distribution change over time?
- Which location factors are associated with the regional growth rates of freelance artists?

• To what extent can sub-groups of artists explain why their distribution, growth rates and other factors differ?

The chapter shows that the amenity-related factors put forward by Florida and his followers fail to explain the agglomeration processes of artists. In contrast, the results clearly confirm the relevance of economic factors which is a central topic in the literature on regional productions systems, local labour markets and externalities. Next to population growth and localization, externalities in particular play a significant role. Such externalities are related to negative effects which come into existence when the number of regional artists becomes too large in comparison to the population.

This chapter used the static – conventional – approach and analysed factors that explain the concentration of artists (e.g. the share of artists). Moreover, it advances the existing literature by considering the change of the concentration (e.g. the growth rates of artist's population). The static analyses seem to confirm the findings from this stream of literature. The concentration of artists is higher in urban regions that are characterised by high population densities, tolerance towards foreigners and higher productivity in terms of GDP per Capita.

Moreover, a local creative milieu (determined from the number of graduates of artistic and culture disciplines per inhabitant and the share of same-sex marriages) positively and significantly correlated with the share of freelance artists.

Looking at the effect size factor, the coefficients of the creative milieu are highest, followed by urbanity and the cultural demand.

However, when a dynamic perspective is applied – and thus a more appropriate approach – results changed substantially. The model for all artists revealed that population growth and the relative concentration of artists in 2007 are the best predictors for growth of regional artist populations. Results indicate a negative effect. Regional growth rates of artists between 2007 and 2010 are negatively impacted by a high relative concentration in 2007. The models for the four artist branches reveal significant differences. This finding might indicate the relevance of variations of production and consumption schemes among the branches.

Chapter 4 tackled the third major shortcoming: a lack of in-depth insights into the motives and decisions of inter-regional mobility of creative individuals.

5.1 Summary

It analysed the relative importance of migration motives over their life course of one group of bohemians – namely people from the field of design and advertising. The analyses in chapter 3 do not differentiate between endogenous growth and migration; and existing literature on the migration of the creative class fails to adequately address the life course perspective, which is essential for understanding migration decisions and choices of destinations (Mulder and Hooimeijer, 1999). Therefore, migration behaviour and motives during three different life stages were compared: student, young professional and (established) professional stages. Using an innovative research design – the life-history-calendar method (LHC) – in-depth interviews with individuals involved in the design and advertising industry from three different regions in Germany were conducted to shed light on the inter-regional migration motives of this particular occupational group of the creative class. This chapter analyses a rich and unique dataset of spatial and career trajectories of designers and advertisers to address the questions:

- Why and to where do people from design and advertising move?
- How do migration motives and destinations change over a lifetime?

In the first life course stage, obtaining a qualification is the main motive for moving, but the choice of destination is also guided by the wish to stay near family and friends. For young professionals the availability of a job or the opportunity of being self-employed mainly determines the decision to move or stay. Social relations are important, but most interviewees were willing to rank these as less important for their careers. In the last stage, social relations play the dominant role. Interviewees had started a family, become house owners, established an enterprise or occupied a leading position in a company. Only unemployment or the enticement of a position with very good conditions motivated them to move at this stage. Thus, interviewees have other motives that shape their decisions and choice of destination than Florida suggests. Moreover, preferences change over a lifetime.

When looking for job outside their current place of living, interviewees repeatedly named a number of metropolitan regions: Hamburg, Berlin, Düsseldorf, Cologne and Munich. This might explain the results from most quantitative research that show an association between openness, tolerance and amenities as well as the concentration of creative occupations. An abundance of soft location factors is – in fact – a feature of these regions, but the interviewees did not highlight these among the important motivations for migration. Thus, the causality might be the other way around. First, students are attracted to universities, the possibity to acquire skills and human capital. After graduation they are looking for places with good career prospects in their respective fields. A concentration of creative occupations then leads to an expansion of amenities, because their earnings are high and they are willing to spend money on cultural products and services (Storper and Manville, 2006; Storper and Scott, 2008). Moreover, the reputation of a place in a certain field might be advantageous, because the positive characteristics of a place are projected to individual skills (Scott, 1997).

5.2 Limitations and further need for research

This dissertation contributes to the literature by addressing three major shortcomings: (1) the definition of the creative class, (2) the spatial concentration and its dynamics and (3) the inter-regional mobility of creative individuals. However, every chapter has its limitations and leaves space for further research.

Regarding the results of Chapter 2, there is still need for further research in order to obtain a clearer picture of the relationship of individual and regional level variables and the direction of causality. Furthermore, the empirical approach of this chapter has some shortcomings. The dataset covers 10,176 individuals in 96 planning regions, thus on average, there are only about 100 individuals per region.

Furthermore, personality scores are obtained by a questionnaire and selfassessment. Some responses may be biased, because the interviewees may not answer truthfully, but what they think is the socially desirable answer. Moreover, the analyses are static in nature and cannot portray dynamics, which are relevant when exploring agglomeration effects and the causality of regional economic effects. Are these creative individuals attracted by soft location factors or do they create a tolerant and creative environment?

One way to further explore the relationship of creativity and geography could be to collect higher quality data on personality traits with larger sample sizes. As this data is more or less currently unavailable, occupational approaches to creativity seem, at the moment, unavoidable. Thus, to establish better causality, multi-level and dynamic approaches seem more practicable for the near future. Due to the high heterogeneity of results, even within the creative class, it seems feasible for further research to limit future analyses to specific occupations and/or industries.

Overall, the chapter has shown that the combination of the big five concept and theories from creative class literature helps to gain insights into the geography of creativity. The combination of economic geography and psychology can be useful for both disciplines, as can be demonstrated by studies such as Obschonka et al. (2013).

Regarding the empirical approach of Chapter 3, there are a number of shortcomings that need to be pointed out. First and most importantly, the dataset does not differentiate between endogenous growth and migration. The change in the number of artists in a region, i.e. migration, depends only to a certain extent on regionally exogenous factors. Despite the above average spatial mobility of artists that is postulated (but not empirically backed up) by Florida, the change in the number of artists in any given region should depend more on the behaviour of the endogenous artists than on migration to and from that region. In terms of the stock (the endogenous stock of artists in a region), the question arises whether it is growing or declining (independently of migration). In general, the characteristics of a region itself are likely to be more important for a change in the number of endogenous artists than those of other regions.

When investigating the importance of particular regional factors, many studies – including this present study – just look at the net change in the number of members of the creative class in a certain region. However, this number is subject to inter-regional migration of members and changes in the endogenous stock of members. Regional factors of the kind investigated in this present study may play completely different roles in the two processes. For instance, universities provide degrees to students from artistic or cultural disciplines and thereby 'transform' inhabitants into artists. They also attract young people interested in a career in a creative job or sector from outside the region. When they graduate, those students stay in their university's region and enlarge the population of the creative class (Florida et al., 2008). These two different roles are overlooked when investigating the net change in the number of regional creative class.

Accordingly, future studies should separate the net change into the net result of migration and the net change due to regional endogenous processes. Regional characteristics then should be evaluated to see whether they have an impact on migration decisions or if they stimulate a region's endogenous potential of the creative class. The second shortcoming of the present study is the potential underestimation of the role of amenities, because indicators predominantly focus on cultural and natural amenities. Other amenities might be relevant as well. For instance, the 'coolness' of German regions was not tested explicitly, which Florida claims to be relevant in this respect (Florida, 2002a).

It is generally difficult to empirically approximate intangible location characteristics such as amenity-related factors. Accordingly, the larger explanatory power of economic factors in the models might be due to the fact that the interregional variance of available statistical data is more precise than amenity-related factors. Moreover, the theoretically deduced factors may be insufficient, because they are derived from the human capital theory in general and/or specifically from the creative class literature. The analyses focus on very particular occupations. Thus, other occupation-specific factors might be more relevant to freelance artists.

Thirdly, the analyses made use of regionally aggregated data. Accordingly, processes at the micro (individual) level (e.g. gender, age, income, etc.) may not have been taken into account, which might be unrelated to regional characteristics. Future research therefore needs to employ data at the individual level, including information on the spatial mobility of artists. This leads to the last shortcoming. The use of quantitative data might not be sufficient to answer the research question. Qualitative methods could deliver valuable insights into individual behaviour, a topic which is complex and not easily available in quantitative datasets.

Chapter 4 presented results from a qualitative case study. Thus, some particularities of the results must be pointed out. The case study regions are not representative for all German regions. Thus, some of Florida's arguments might be valid for cities like Berlin, Hamburg, Munich and Cologne. Similarly, in rural regions the absence of urban amenities or education opportunities might be considered a substantial push factor. This study's findings apply primarily to second-tier cities in Germany which possess higher education institutions. Furthermore, the case study cities constitute a single urban core of the region surrounded by rural regions. This is in stark contrast to the dense and polycentric urban setting in, for instance, the Ruhr area or Rhine-Main area, where the direct competition for talents from neighbouring cities is higher. Moreover, the interviews were limited to people from design and advertising. Thus, results might be biased due to the very specific spatial structure and the distribution of design and advertising companies as well as the university programmes in arts, design and media. Hence, further case studies on different regions and/or occupations can help to provide a more comprehensive picture of the migration of the creative class. Moreover, future research should investigate the relative role of universities, the reputation and industrial structure in a region as attractor of talents from different occupational backgrounds. Likewise, social relations of migrants should play a more central role regarding research on mobility of the creative class in general.

Overall, the dissertation leaves room for further research. There is still no clear picture of the relation of creativity and geography. Therefore, research could investigate the interplay of individual creativity and regional characteristics. How does the relationship evolve over time? Is individual creativity reinforced by a specific regional environment? What is the effect on regional economic outcomes of a spatial concentration of creative individuals over time?

The results also showed that creativity is related to other individual characteristics such as income, human capital and entrepreneurial activities. However, this relation seems to depend on the occupational or sectoral background. Why is creativity 'transformed' into economic success or entrepreneurial activities in one occupation more than in others? Or is creativity a too general term and the question of skills and tasks that are associated with occupations is more relevant than personality traits? Thus, studies on specific occupations and their skill composition are of interest to better understand their relation to a regional economy.

Concerning mobility, there are still few studies that really employ migration data. Therefore, in order to evaluate the relative importance of soft and hard location factors that influence migration behaviour, it seems necessary to make use of large quantitative datasets of migration of creative class members or of specific occupations. Moreover, an analysis of the relative importance of endogenous growth or exogenous immigration should be evaluated to guide the future emphasis of policies.

Finally, studying the causes and effects of migration and concentration of creative individuals, dynamic and/or multi-level approaches seem most suitable for further research.

5.3 Policy implications

Sternberg (2012) showed that Florida created a new mantra for regional policies that was rapidly adopted by decision-makers. Moreover, he revealed that it seems questionable, if and how policies influence the development and growth of regional 'creative' economies.

Each chapter of this dissertation works out policy implications that are aimed at creative individuals, especially at their mobility. Regarding possible policy implications from Chapter 2, it is obvious that creativity per se is not associated with regional effects. The occupational and/or sectoral context seems to matter in this respect. Especially, the focus on cultural and creative industries in Germany should be questioned, keeping the results for creative individuals and bohemians in mind. Moreover, investments in amenities are questionable as well. The share of bohemians was only significant in models for bohemians. However, an open and tolerant climate seems truly favourable for a concentration of creative individuals and creative class members. However, it takes a long time to alter attitudes and beliefs of people and thus suitable policy measures are difficult to conceive.

Consider results from Chapter 3, there are crucial implications for policy makers in general, and particularly for those who are potentially inspired by Florida's ideas for supporting the regional agglomeration of the creative class. Firstly, this concerns the questionable importance of amenities, because they are not found to be associated with any empirical effect on the agglomeration of artists. Secondly, support programmes need to seriously consider the significant differences among the groups of artists. Given the severe heterogeneity within this relatively small sub-group of the creative class, it is doubtful whether suitable policies can be designed for the creative class as a whole (see Sternberg, 2012, for a detailed discussion).

The results form the case study of Chapter 4 revealed some implications for

policy makers who want to attract creative people. First of all, creative people are most mobile after finishing school and/or university. When it comes to attracting students who are interested in a creative career, the choice of a university is decisive. Universities that offer creative courses and are well-equipped with technical facilities and posses well-regarded professors, are likely to attract students interested in a creative career. Moreover, there is a window of opportunity to retain students after university. If there are good job or entrepreneurial opportunities in a region in the respective industry, students will likely stay there.

To attract young professionals from outside a region, it seems to be important improve the reputation of that region and to market it as a place with well-regarded companies and a thriving labour market. However, Niedomysl (2004) could not find evidence on the effect of marketing campaigns on the immigration in municipalities in Sweden.

The results suggest implementing a process that matches skills with industryspecific regional labour markets. Thus certain policies can play an important role as information brokers. Job matching programmes can help to foster the efficiency of information exchange and thus more effectively match labour demand and supply (Storper and Scott, 1995). Moreover, policy makers should develop a holistic strategy. This strategy should involve stakeholders from local companies, higher education organisations and economic promotion agencies. Establishing links between universities and local companies could help to retain graduates in the region and foster knowledge transfer into the local economy. Supporting university spinoffs is an accompanying to secure knowledge transfer; and self-employment constitutes an alternative to dependent employment outside the region. However, it seems advisable to tailor policies towards a specific occupation or industry, rather than trying to attract or support an inhomogeneous group such as the whole creative class.

The results of the dissertation provide some general policy implications and holds room for future research. Regarding the results of the three publications it became obvious that the creative class is very heterogeneous. Members of the creative class differ substantially in regard to their individual characteristics as well as their regional preferences and effects. Policies makers should be aware of this heterogeneity. Rather than trying to implement a 'one size fits all' strategy, they should focus on a particular occupational group. Moreover, each group seems to be sensitive to different factors and incentives raising the question of the appropriate support measure for a specific target group.

Recently, regional policies in Germany have focussed on cultural and creative industries. Individuals from this branch mostly correspond to Florida's bohemians. The results of the dissertation do not indicate any direct positive effects of a concentration of bohemians on regional economic outcomes. Moreover, they are marked by lower wages and high rates of self-employment. But there is some evidence for openness and tolerance for attracting other creative class members. If bohemians are part of this kind of local climate or milieu, this could be a rationale to support this sector. Nevertheless, interviews and dynamic analyses showed that factors influencing the mobility and concentration of individuals from creative industries vary over a life time and by branch. Do decision-makers want to attract students interested in a creative career or young professionals instead? At which specific branch are measures aimed? Again it was shown that industry or branch specific measures seem most appropriate and soft location factors matter less. Moreover, a large part of destination choice is explained by individual preferences and social relation which are hardly influenced by policy measures.

Results suggest that policy makers who are interested in economic growth and innovation driven development, should better stick to 'traditional' structural policies that focus on high-tech and knowledge-intensive industries or services. The results of this dissertation show that professionals and core members are economically more prosperous, have a high level of human capital and work more often in high-tech industries or knowledge-intensive services. Moreover, professionals seem to be entrepreneurial and are concentrated in innovative regions. This concurs to the results from Marrocu and Paci (2012a,b), who showed that regional productivity is mostly driven by highly qualified creative class members.

The focus on mobility of human capital and soft location factors remains questionable. Most of the results indicate that endogenous growth seems to have a greater impact on the spatial patterns of creative individuals or their change over time. In addition, if people are mobile they seem to migrate in order to match their skills to local labour markets. Creative hubs in Germany are characterised by a concentration of well-regarded companies from cultural and creative industries that can attract young professionals, because of job opportunities and reputation gains that foster their careers. However, the fact that these regions belong to the top league of creative hubs seems not to be caused by their rich endowment with amenities. On the contrary, the causality is likely to be the other way around. Local demand seems necessary especially for individuals from cultural and creative industries to successful market their services and products.

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Appendix A

Tables

Variables	Description	Source
	individual level	
degree	Highest degree/diploma at- tained (0)'in school' or 'inadequately'; (1)'general elementary'; (2)'middle vo- cational'; (3)'vocational + Abi'; (4)'higher vocational'; (5)'higher education'	SOEP (2009)
income	Current net labor income in euros	SOEP (2009)
foreign-born	(0) 'domestic'; (1) 'foreign- born'	SOEP (2009)
same-sex relation- ship	(0) 'not living in a same-sex re- lationship'; (1) 'living in a same- sex relationship'	SOEP (2009)
self-employed	(0) 'not self-employed'; (1) 'self-empolyed'	SOEP (2009)
entrepreneur	(0) 'not self-employed'; (1) 'self-empolyed with employees'	SOEP (2009)

Table A.1: Variable description

high-tech	high technology manufacturing NACE 2-digit level (Rev 1.1): (30, 32, 33) (0) 'not working in high-tech manufacturing sector'; (1) 'working in high-tech manu- facturing sector'	SOEP (2009)
high KIS	high-tech, knowledge-intensive services NACE 2-digit level (Rev 1.1): (64, 72, 73) (0) 'not working in high-tech, knowledge-intensive services'; (1) 'working in high-tech, knowledge-intensive services'	SOEP (2009)
culture	cultural sector NACE 2-digit level (Rev 1.1): (92) (0) 'not working in the cultural sector'; (1) 'working in the cultural sec- tor'	SOEP (2009)
	regional level	
share of bohemians	share of freelance artists on the population in percent (2009)	KSK (2011)
share of same-sex marriages	same-sex marriages per 10,000 marriages (2011)	DESTATIS (2011)
share of foreigners	share of foreigners on the popu- lation in percent (2009)	BBSR (2012a)
start-up rate	new companies, new estab- lishments of existing compa- nies, self-employment as an sec- ondary activity as well as the re- locations and acquisitions of es- tablishments per 10,000 inhabi- tants (2009)	IfM (2011)
share of self-	share of self-employed on the	

patents per inhabi- tant	mean of EPO and PCT patents between 2005 and 2010 of patents per 100,000 inhabitants	OECD RegPat (2005-2010)
population density	inhabitants per squarekilometer	BBSR (2012a)

Variables	Ν	Mean	SD	Min	Max
degree	10,176	2.985	1.469	0	5
income	10,176	1,810.82	1,349.20	0	26,673
foreign-born	10,176	0.052	0.222	0	1
same-sex relationship	10,176	0.004	0.065	0	1
self-employed	10,176	0.054	0.226	0	1
entrepreneur	10,176	0.051	0.219	0	1
high-tech	10,176	0.012	0.108	0	1
high KIS	10,176	0.039	0.192	0	1
culture	10,176	0.014	0.117	0	1
share of bohemians	10,176	2.001	1.816	0.368	8.603
share of same sex marriages	10,176	17.091	13.612	2.156	67.144
share of foreigners	10,176	8.334	4.448	1.4	16.4
start-up rate	10,176	2,177.60	808.692	956.4	4,221.70
share of self-employed	10,176	10.995	1.648	6.7	17.2
patents per inhabitant	10,176	44.894	30.811	3.4	131.3
population density	10,176	2,068.47	1,060.19	603.9	5,581.40

Table A.2: Descriptives: Independent variables

	creative class	core members	profess- ionals	bohem- ians
Intercent	-0.496**	-2.564***	-1.115***	-4.874***
Intercept	(0.609)	(0.077)	(0.328)	(0.008)
dagraa	0.912***	1.57***	0.116***	0.404***
degree	(2.489)	(4.808)	(1.123)	(1.498)
incomo	0.698***	0.14***	0.267***	-0.203*
Income	(2.009)	(1.151)	(1.307)	(0.816)
fourier hour	-0.673***	-0.436**	-0.567***	-0.767
loreign-born	(0.51)	(0.647)	(0.567)	(0.464)
come car relationship	1.016**	0.982**	0.389	
same-sex relationship	(2.762)	(2.669)	(1.476)	-
calf amployed	1.026***	-0.186	0.684***	1.504***
sen-employed	(2.789)	(0.83)	(1.982)	(4.499)
antropropaur	0.641***	-0.599***	0.826***	-0.156
entrepreneur	(1.898)	(0.549)	(2.283)	(0.856)
high tach	0.023	-1.328***	0.618***	
mgn-tech	(1.024)	(0.265)	(1.854)	-
high VIS	0.81***	0.58***	0.219**	0.298
liigii KIS	(2.248)	(1.785)	(1.245)	(1.348)
culture	0.831***	-1.282***	-0.944***	4.255***
Culture	(2.294)	(0.277)	(0.389)	(70.447)
share of foreigners	0.15***	0.062	0.066*	0.583***
share of foreigners	(1.162)	(1.064)	(1.069)	(1.791)
CDP par conita	0.373	0.173	0.171	-0.324
ODF per capita	(1.452)	(1.189)	(1.186)	(0.723)
start ups	-0.062	-0.05	-0.038	0.07
start-ups	(0.94)	(0.951)	(0.963)	(1.072)
share of self employed	0.008	-0.001	-0.013	0.092
share of sen-employed	(1.008)	(0.999)	(0.987)	(1.097)
natente per inhabitant	0.016	-0.011	0.054*	-0.118
patents per initautant	(1.016)	(0.989)	(1.056)	(0.888)

Table A.3: Multi-level regressions: Creative class models - share of foreigners

odss in parentheses, * p <0.1, ** p <0.05, *** p <0.01

	5%-	10%-	15%-	20%-
	quantile openness	quantile openness	quantile openness	quantile openness
	_2 289***	-1 865***	_1 73***	-1 015***
Intercept	(0.101)	(0.155)	(0.177)	(0.362)
	0.207***	0.222***	0.269***	0.257***
degree	(1.23)	(1.248)	(1.308)	(1.294)
	0.018	-0.013	-0.018	(11-)
income	(1.019)	(0.987)	(0.982)	-0.157766
	-0.097	-0.052	-0.1	0.015
foreign-born	(0.907)	(0.949)	(0.905)	(1.015)
	-0.286	-0.355	-0.454	-0.21
same-sex relationship	(0.751)	(0.702)	(0.635)	(0.81)
	0.752***	0.688***	0.683***	0.642***
self-employed	(2.121)	(1.991)	(1.98)	(1.9)
	0.272*	0.431***	0.352***	0.269***
entrepreneur	(1.312)	(1.539)	(1.422)	(1.309)
		-0.078	-0.054	0.195
high-tech	-0.4 (0.67)	(0.925)	(0.948)	(1.216)
1.1 1/10	-0.176	-0.103	-0.058	-0.099
high KIS	(0.839)	(0.902)	(0.943)	(0.906)
1 4	1.212***	1.195***	1.116***	1.104***
culture	(3.36)	(3.305)	(3.051)	(3.017)
share of foreigners	0.234**	0.207***	0.116*	0.148**
share of foreigners	(1.263)	(1.229)	(1.123)	(1.159)
CDP par conito	-0.407	-0.21	0.223	-0.043
ODF per capita	(0.666)	(0.811)	(1.249)	(0.958)
start ups	-0.032	-0.015	-0.059	-0.059
start-ups	(0.969)	(0.985)	(0.942)	(0.943)
share of self-employed	-0.117**	-0.09**	-0.037	-0.049
share or sen-employed	(0.89)	(0.914)	(0.963)	(0.952)
natents per inhahitant	-0.003	-0.023	-0.04	-0.042
patents per innaoitant	(0.997)	(0.978)	(0.961)	(0.959)

Table A.4: Multi-level regressions: Creative individuals models – share of foreigners

odss in parentheses, * p <0.1, ** p <0.05, *** p <0.01

	creative	core	profess-	bohem-
	class	members	ionals	ians
Intercent	-0.628***	-2.671***	-1.179***	-5.383***
Intercept	(0.534)	(0.069)	(0.308)	(0.005)
dagraa	0.908***	1.569***	0.114***	0.389***
degree	(2.478)	(4.804)	(1.121)	(1.475)
incomo	0.703***	0.142***	0.27***	-0.191*
nicome	(2.02)	(1.153)	(1.31)	(0.826)
fornian horn	-0.665***	-0.425**	-0.562***	-0.759
loreign-born	(0.514)	(0.653)	(0.57)	(0.468)
come car relationship	1.005**	0.993**	0.387	
same-sex relationship	(2.731)	(2.7)	(1.472)	-
calf amployed	1.023***	-0.185	0.682***	1.5***
sen-employed	(2.782)	(0.831)	(1.978)	(4.48)
antropponava	0.642***	-0.6***	0.826***	-0.14
entrepreneur	(1.9)	(0.549)	(2.283)	(0.869)
high took	0.021	-1.335***	0.616***	
mgn-tech	(1.021)	(0.263)	(1.851)	-
high VIC	0.809***	0.58***	0.218**	0.285
liigii KIS	(2.245)	(1.787)	(1.243)	(1.33)
aultuma	0.822***	-1.284***	-0.949***	4.222***
culture	(2.276)	(0.277)	(0.387)	(68.198)
donsity	0.118***	0.02	0.047*	0.28**
density	(1.126)	(1.02)	(1.048)	(1.323)
CDD par conite	0.492**	0.286	0.228	0.191
ODF per capita	(1.635)	(1.331)	(1.256)	(1.211)
start ups	-0.047	-0.051	-0.031	0.058
start-ups	(0.954)	(0.951)	(0.969)	(-1.06)
shows of colf ownlowed	-0.003	-0.005	-0.02	0.059
share of sen-employed	(0.997)	(0.995)	(0.98)	(1.061)
notanta nor inhabitant	0.052	0.007	0.071**	0.128
patents per innaoitant	(1.053)	(1.007)	(1.074)	(1.136)

Table A.5: Multi-level regressions: Creative class models - share of self-employed

odss in parentheses, * p <0.1, ** p <0.05, *** p <0.01

	5%-	10%-	15%-	20%-
	quantile	quantile	quantile	quantile
	openness	openness	openness	openness
Intercent	-2.604***	-2.086***	-1.786***	-1.197***
Intercept	(0.074)	(0.124)	(0.168)	(0.302)
dagnaa	0.204***	0.218***	0.266***	0.255***
degree	(1.226)	(1.243)	(1.305)	(1.291)
incomo	0.023	-0.009	-0.016	0.016
Income	(1.023)	(0.991)	(0.984)	(1.016)
forcian horn	-0.084	-0.042	-0.095	0.023
Toreign-born	(0.92)	(0.959)	(0.909)	(1.023)
come con relationship	-0.272	-0.35	-0.454	-0.207
same-sex relationship	(0.762)	(0.704)	(0.635)	(0.813)
calf amployed	0.75***	0.686***	0.681***	0.641***
sen-employed	(2.118)	(1.985)	(1.976)	(1.899)
ontropropolir	0.271*	0.432***	0.352***	0.27***
entrepreneur	(1.312)	(1.54)	(1.422)	(1.31)
high tooh	-0.408	-0.083	-0.057	0.192
IIIgii-teeli	(0.665)	(0.92)	(0.945)	(1.212)
high KIS	-0.176	-0.104	-0.06	-0.099
lligh KIS	(0.838)	(0.901)	(0.942)	(0.906)
oulturo	1.209***	1.189***	1.111***	1.102***
culture	(3.349)	(3.282)	(3.037)	(3.009)
density	0.119	0.136**	0.088*	0.087*
density	(1.127)	(1.145)	(1.092)	(1.09)
GDP per conito	-0.09	0.003	0.319	0.137
ODI per capita	(0.913)	(1.003)	(1.376)	(1.147)
start une	-0.019	0.001	-0.048	-0.05
start-ups	(0.981)	(1.001)	(0.953)	(0.951)
share of self-employed	-0.14**	-0.109**	-0.046	-0.057
share or sen-employed	(0.87)	(0.897)	(0.955)	(0.944)
natents ner inhahitant	0.06	0.031	-0.012	-0.004
patents per milaonant	(1.062)	(1.031)	(0.988)	(0.996)

Table A.6: Multi-level regressions: Creative individuals models – share of self-employed

odss in parentheses, * p <0.1, ** p <0.05, *** p <0.01

	creative	core	nrofess-	bohem.
	class	members	ionals	ians
Intercent	-0.529***	-2.602***	-1.141***	-5.166***
Intercept	(0.589)	(0.074)	(0.32)	(0.006)
dagraa	0.906***	1.567***	0.113***	0.376***
degree	(2.474)	(4.794)	(1.12)	(1.456)
incomo	0.702***	0.142***	0.27***	-0.192*
liicome	(2.018)	(1.153)	(1.31)	(0.825)
fourier hom	-0.659***	-0.427**	-0.558***	-0.758
loreign-born	(0.518)	(0.652)	(0.572)	(0.469)
	1.003**	0.984**	0.385	
same-sex relationship	(2.727)	(2.674)	(1.469)	-
alf annious d	1.021***	-0.188	0.682***	1.51***
sen-employed	(2.777)	(0.829)	(1.977)	(4.528)
	0.638***	-0.601***	0.824***	-0.15
entrepreneur	(1.892)	(0.548)	(2.279)	(0.861)
1'-1 4-1	0.026	-1.331***	0.618***	
nign-tecn	(1.027)	(0.264)	(1.855)	-
high MIC	0.807***	0.579***	0.218**	0.292
nign KIS	(2.24)	(1.785)	(1.243)	(1.339)
ov.14v	0.817***	-1.291***	-0.952***	4.202***
culture	(2.264)	(0.275)	(0.386)	(66.806)
shows of some one man	0.127***	0.039	0.048*	0.362***
riages	(1.136)	(1.04)	(1.049)	(1.436)
CDP par conito	0.39*	0.206	0.19	-0.078
ODF per capita	(1.477)	(1.229)	(1.209)	(0.925)
start ups	-0.055	-0.048	-0.035	0.101
start-ups	(0.947)	(0.953)	(0.966)	(1.106)
abore of calf amployed	-0.023	-0.016	-0.029	-0.074
share of self-employed	(0.977)	(0.984)	(0.972)	(0.928)
notanta non inhahitant	0.094**	0.02	0.089***	0.185
patents per innabitant	(1.099)	(1.02)	(1.093)	(1.203)

Table A.7: Multi-level regressions: Creative class models – share of same sex marriages

odss in parentheses, * p <0.1, ** p <0.05, *** p <0.01

	5%-	10%-	15%-	20%-
	quantile	quantile	quantile	quantile
	openness	openness	openness	openness
Intercent	-2.446***	-1.916***	-1.786***	-1.127***
mercept	(0.087)	(0.147)	(0.168)	(0.324)
dagraa	0.201***	0.215***	0.266***	0.255***
degree	(1.223)	(1.24)	(1.304)	(1.29)
income	0.022	-0.01	-0.016	0.015
Income	(1.023)	(0.99)	(0.984)	(1.016)
foreign born	-0.079	-0.035	-0.091	0.027
Toreign-born	(0.924)	(0.966)	(0.913)	(1.027)
some say relationship	-0.279	-0.362	-0.454	-0.209
same-sex relationship	(0.756)	(0.696)	(0.635)	(0.812)
self_employed	0.749***	0.683***	0.681***	0.64***
sen-employed	(2.114)	(1.98)	(1.976)	(1.897)
antranranaur	0.269*	0.428***	0.35***	0.268***
entrepreneur	(1.308)	(1.535)	(1.419)	(1.307)
high tech	-0.404	-0.077	-0.054	0.195
nigh-teen	(0.668)	(0.926)	(0.948)	(1.216)
high KIS	-0.177	-0.105	-0.059	-0.099
lingii Kis	(0.838)	(0.9)	(0.942)	(0.906)
culture	1.2***	1.179***	1.109***	1.098***
culture	(3.32)	(3.253)	(3.03)	(2.999)
share of same sex mar-	0.153**	0.169***	0.087*	0.095**
riages	(1.165)	(1.184)	(1.09)	(1.099)
CDP por conito	-0.261	-0.178	0.271	0.065
ODF per capita	(0.77)	(0.837)	(1.312)	(1.067)
stort ups	-0.024	-0.004	-0.054	-0.055
statt-ups	(0.977)	(0.996)	(0.947)	(0.947)
share of self employed	-0.163***	-0.133***	-0.059	-0.075**
share of sen-employed	(0.849)	(0.876)	(0.943)	(0.928)
natents per inhabitant	0.109	0.083	0.018	0.027
patents per minabitant	(1.115)	(1.086)	(1.018)	(1.027)

Table A.8: Multi-level regressions: Creative individuals models – share of same sex marriages

odss in parentheses, * p <0.1, ** p <0.05, *** p <0.01 Source: SOEP (2012), own calculation

Variable	Ν	Mean	SD	Min	Max	Source
GDP per Capita (2007) [thousand EURO]	412	28.0	11.0	13.1	86.7	BBSR (2012a)
share of foreigners (2007) [%]	412	7.2	4.6	0.7	25.2	BBSR (2012a)
mixed marriage (2007) [%]	412	0.1	0.0	0.006	0.244	BBSR (2012a)
share of same-sex marriages on all marriages (2007) [%]	412	0.1	0.1	0.007	0.741	DESTATIS (2011)
population density (2007) [inhab. per qkm]	412	521.0	672.2	38.7	4,221.50	BBSR (2012a)
number of beds per tourist enterprise (2007)	412	38.9	52.4	3.7	594.7	BBSR (2012a)
number of overnight stays per tourist enterprise (2007)	412	4.9	6.7	0.4	76.9	BBSR (2012a)
property damages per inhab. (2009)	412	1.6	1.5	0.086	12.498	Lernatlas (2011)
street crime offences per inhab. (2009)	412	66.1	27.1	25.9	162.763	Lernatlas (2011)
robberies per inhab.(2009)	412	0.4	0.3	0	2.264	Lernatlas (2011)
visitors of museums per hundred inhabitants (2009)	412	124.6	87.3	20.876	503.913	Lernatlas (2011)
visitors of theatres and concerts per household (2009)	412	0.6	0.4	0	2.526	Lernatlas (2011)
share of inhabitants between 25 and 30 (2007)	412	5.8	1.1	4.1	10.1	BBSR (2012a)
share of inhabitants between 18 and 25 (2007)	412	8.3	1.0	6.3	14.9	BBSR (2012a)
number of graduates of artistic disciplines (mean 2007 -2010)	412	107.2	334.2	0	3,362.33	DESTATIS (2011)
number of graduates of culture disciplines (mean 2007 -2010)	412	26.5	96.0	0	1,299.00	DESTATIS (2011)
number of students (2007) [per thousand inhab.]	412	20.5	41.6	0	245.6	BBSR (2012a)
sunshine hours [yearly mean sunshine hours for 30 years]	412	1536.7	113.3	1,231.90	1,917.50	DWD (2011)
forest area per inhab. (2009) [qm]	412	1852.0	1864.7	8.7	9,117.50	BBSR (2012a)
water area per inhab. (2009) [qm]	412	149.3	295.2	3.4	3,887.70	BBSR (2012a)
recreation area per inhab. (2009) [qm]	412	5282.1	4891.2	86.4	25,212.20	BBSR (2012a)
share of citizen committed church and religion $[\%]$	412	7.8	2.9	1.6	17.3	Lernatlas (2011)
share of citizen committed youth [%)	412	9.7	3.5	0.7	19.8	Lernatlas (2011)
share of citizen committed elderly [%]	412	4.0	1.7	0.2	9.1	Lernatlas (2011)

Table A.9: Descriptives: Factor variables

Table A.10: Coding scheme

Motive	Content	Example
Job availability	Unemployment in the cur- rent region or job oppor- tunities in another region stated as an important mo- tive.	So I made quite a few appli- cations. I've been in Ham- burg, also in Cologne, for job interviews. But it didn't work. And then it was, I would say, the fifth applica- tion or so, when I got my first job.
Job quality	Dissatisfaction with the current job or good job op- portunities in another re- gion stated as an important motive.	I've been poached. They knew me. I got to know them during my apprentice- ship. It was a relatively large company in Hameln and they were looking for a new art di- rector. They tried to lure me and they succeeded.
Qualification	University or apprentice- ship is mentioned as the main reasons for migra- tion.	It was important for me to find a university that is ex- cellent in the field and has first-class professors. So in Dusseldorf, for example, for photography, film, print there are a lot of different facili- ties or workshops, for wood and metal crafting. They are well-equipped. This is not the case in many other uni- versities, simply because the money is not there.

Social Relations	All motives are connected to the wish to be near fam- ily, partner and friends.	And in the evaluation or as- sessment of the three sites, I made my decision depen- dent upon the travel time to my family Even though the agency would have been extremely attractive and the owner had called me repeat- edly to try to convince me.
Self-employment	Self-employment as a rea- son to leave or stay in the current region.	We were actually well- connected and already had customers here. It really wasn't an alternative to go to a different region. If you leave out closeness to the family and only assume location factors, it is because the network, the target group is here.
Reputation	The reputation of the re- gion is mentioned to be important for the migra- tion decision.	In the 80s/90s there were two major centres for advertis- ing agencies: Hamburg and Frankfurt.
Mentality	The mentality in the cur- rent and/or destination re- gion influenced the deci- sion to move.	We are both North German. We didn't feel comfortable in South Germany, didn't like the mentality somehow.

Appendix B

Figures



Figure B.1: Additional random intercepts (odds ratios with confidence intervals)

	15%-quantile openness	
Donau-Wald		
Göttingen Westpfalz		
Donau-Iller (BW)	_	_
Südthüringen		_
Bopp		
Halle/S.		_
Mittelhessen		
Vorpommern		
Lüneburg		
Südsachsen		
Schleswig-Holstein Süd		
Bremen-Umland		
Mittelthüringen		
Oberlausitz-Niederschlesien		
Oberpfalz-Nord		
Aachen Maaklanburgigaba Saannlatta		
Hochrhein-Bodensee		
Regensburg		
Südostoberbayern		_
Oberfranken-West		
Schleswig-Holstein Nord Braunschweig		
Schleswig-Holstein Ost		_
Oberland		_
Emsland		
Trier		
Nordschwarzwald		_
Osnabrück		
Würzburg		
Donau-Iller (BY)		
Allgäu		
Münster		_
Augsburg		
Westmittelfranken		
Hannover	•	_
Stuttgart		_
Westmecklenburg		
Schleswig-Holstein Süd-West		
Nordthüringen		
Osthessen		
Südheide Anhalt Ritterfeld Wittenherg		
Prignitz-Oberhavel		
Altmark		_
Schleswig-Holstein Mitte		_
Duisburg/Essen Pheinhessen Nahe		
Rheinpfalz		
Oderland-Spree		
Main-Rhön		
Mittlerer Oberthein		
Oberes Elbtal/Osterzgebirge		_
Hamburg-Umland-Süd	• • • • • • • • • • • • • • • • • • •	_
Bodensee-Oberschwaben		
Düsseldorf		
Industrieregion Mittelfranken		
Rhein-Neckar		_
Mittleres Mecklenburg/Rostock		
Ostthüringen		
Neckar-Alb		
Bochum/Hagen		
Arnsberg		
Hildesheim		
Oldenburg		_
Dortmund		
Siegen		
Nordhessen		
Bremerhaven		_
Emscher-Lippe		
Starkenburg		
München		
Ost-Friesland		_
Rhein-Main		
Vvestsachsen Ostwürttemberg		
Lausitz-Spreewald		
Bayerischer Untermain	_	
Oberfranken-Ost		
Paderborn		
Bremen		



	core members
Köln	
Bonn	
Berlin	
Dortmund	
Neckar-Alb	
Nordhessen	
München	
Rhein-Neckar	
Rheinhessen-Nahe	
Starkenburg	
Havelland-Fläming	
Cheres Elbtal/Osterzgebirge	
Mittleres Mecklenburg/Rostock	
Würzburg	
Oldenburg	
Bremen	
Hochrhein-Bodensee	
Mecklenburgische Seenplatte	
Magdeburg	
Oberpfalz-Nord	
Regensburg Oderland-Spree	
Mittelthüringen	
Ostthüringen	
Main-Rhön	
Uckermark-Barnim	
Lüneburg	
Münster	
Aachen	
Duisburg/Essen	
Altmärk Schleswig-Holstein Nord	
Oberland	
Mittelhessen	
Donau-Iller (BW)	
Stuttgart	
Bodensee-Oberschwaben	
Industrieregion Mittelfranken	
Vorpommern	
Braunschweig	
Augsburg Baverischer Untermain	
Oberlausitz-Niederschlesien	
Schleswig-Holstein Süd	
Siegen	
Schleswig-Holstein Mitte	
Mittlerer Oberrhein	
Lausitz-Spreewald	• • • • • • • • • • • • • • • • • • •
Prignitz-Oberhavel	
Dusseldorf	
Westsachsen	
Mittelrhein-Westerwald	• • • • • • • • • • • • • • • • • • •
Hildesheim	
Bielefeld Sebleawig Heletein Süd West	
Nordschwarzwald	
Halle/S.	• • • • • • • • • • • • • • • • • • •
Südlicher Oberrhein	
Bochum/Hagen	
Schleswig-Holstein Ost	
Saar	
Paderborn	
Emsland	
Nordthüringen	
Oberfranken-West	
Osnabrück	
Südsachsen	
Göttingen	
Rheinpfalz	
Donau-Wald	
Westmecklenburg	
Suaneide	
Anhalt-Bitterfeld-Wittenberg	
Emscher-Lippe	
Oberfranken-Ost	
Donau-Iller (BY)	
Bremen-Umland	
Octhessen	
Ostriessen	
Allgäu	
Allgäu Südthüringen	
Allgäu Südthüringen Westmittelfranken Schwarzwald-Baar-Heuberg	
Südthüringen Westmittelfranken Schwarzwald-Baar-Heuberg Arnsberg	

München Mittlerer Oberrhein Köln Starkenburg Hamburg Stuttgart Aachen Oberland Bochum/Hagen Düsseldorf Bonn Osnabrück Schleswig-Holstein Nord Rhein-Main Rhein-Main Rhein-Nackar Schleswig-Holstein Süd Nordschwarzwald Schlessen Schleswig-Holstein Süd-West Schleswig-Holstein Ost Halle/S. Berinn Schleswig-Holstein Sud-West Scheswig-Holstein Sud-West Bremen Donau-Iller (BW) Hamburg-Umland-Süd Worzburg Ingolstadt Worzburg Nitelfranken Braunschweig Bremen Donau-Wald Augsburg Oberfanken-West Paderborn Neckar-Alb Aligau Mittelitteringen Regensburg Westmecklenburg/Rostock Magdeburg Sudhuingen Westmecklenburg/Rostock Magdeburg Sudhuingen Westmecklenburg/Rostock Magdeburg Sudhuingen Westmecklenburg/Rostock Magdeburg Sudhuingen Westmecklenburg/Sostock Magdeburg Sudhuingen Westmecklenburg/Sostock Maddeburg Sudhuingen Nitellrein-Westerwald Armsberg





SOEP own calculation



Figure B.2: QR static approach: artists' branches

(a) Musicians



(b) Writers







Figure B.3: QR dynamic approach: artists' branches

(a) Musicians

0.2 0.4 0.6 0.8



(b) Writers



CULTURE



(c) Visual





(d) Performing

Abbreviations

BBSR	Bundesinstitut für Bau-, Stadt- und Raumforschung (Federal Institute for Research on Building, Urban Affairs and Spatial Development)
BMWi	Bundesministerium für Wirtschaft und Energie (BMWi) (Federal Ministry for Economic Affairs and Energy)
Destatis	Statistische Bundesamt (Federal Statistical Office)
GDP	Gross Domestic Product
INKAR	Indikatoren und Karten zur Raum- und Stadtentwicklung (Indicators and maps on spatial and urban development)
KIS	Knowledge-intensive services
KSK	Künstlersozialkasse (Social Security Insurance for Artists and Writers)
LHC	Life-history calendar
OECD	Organisation for Economic Co-operation and Development
OECD RegPat	Regional patent data of the Organisation for Economic Co-operation and Development
SOEP	Socio-economic panel
QR	Quantile regression

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