

The Effects of Bohemians on Regional Economic Growth

A literature study on the relationship between creativity and the economy

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Abstract

Many academic researchers, urban planners and politicians have tried to either defend or attack the hypothesis that artists are of great importance on economic growth, making this topic a heated debate in the contemporary social and academic world. This paper aims to shed light on this debate by testing whether bohemians, which are the people in artistic occupations, are causing economic growth, using the creative class theory of Richard Florida as a proxy to test this statement with. The effects of bohemians on economic growth will be explained by resynthesizing existing quantitative research that has been performed on this particular subject. To test for the effects of bohemians on economic growth, the concept of economic growth has been split up in four different indicators, the four indicators being employment growth, gross domestic product, entrepreneurship and innovation, to come to clearer conclusions on which specific indicators of economic growth clear conclusions can be drawn regarding the effect of bohemians. Furthermore, since Florida also proposes that bohemians are indirectly responsible for economic growth through the creative class, this relationship has also been researched. The main findings of this research are that human capital tends to be of stronger influence than Bohemian Indices on employment growth and gross domestic product measures. Furthermore, the relationship between entrepreneurship and bohemians happens to be only strong in the largest cities in Europe, while the quantitative research on American cities has provided ambiguous results. Regarding innovation, the main conclusion is that high-tech clustering is only related with bohemians in Canada and the United States and not so much in Europe, where the bohemians are usually concentrating in other cities than high-tech businesses. As for the influence of bohemians on other creative class categories it can be concluded that they are found to be responsible for explaining the presence of other creative class members in both Europe and North America with the magnitude of the influence of bohemians being bigger on the super-creative core than on creative professionals.

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Introduction

Creativity has become a popularised component for causing urban economic growth ever since the introduction of the creative class theory by Richard Florida (2002a). This theory describes the creative class as part of the total workforce employed in professions with a primary job to create new approaches to problems. Florida divides the creative class into three sections, being the super-creative core, the bohemians and creative professionals. In his book, Florida proposes that the creative class either fosters a major shift away from traditional economies or a general restructuring of the economic system. This proposal of Florida can be linked to Schumpeter's theory of creative destruction, explaining that a mutation of the current economic system leads to innovation and thus economic growth (Schumpeter, 1942). Hence, by combining both of these economically accepted theories, one can derive that creative people spur economic development. This finding is supported by earlier research by Jane Jacobs who argues that if cities are able to attract creative people, economic growth is stimulated (Jacobs, 1984). Furthermore, Robert Cushing of the University of Texas has tested the creative capital theory of urban economic growth in the United States and found that there is strong significant evidence that existence of the creative class causes regional economic growth, with the predictive power of the Bohemian Indices being particularly high (Florida, 2003a). This paper uses the definition of Florida when speaking of the bohemians, which are a group of people within the creative class that live an unconventional lifestyle and are employed in artistic professions, for example actors, musicians, writers and artists. Similarly, Boschma and Fritsch (2009) also tested Florida's theory on the creative class in European countries and found significant evidence that creative class measures had a positive effect on employment growth in the Netherlands, while in Germany this positive effect was only present for the share of bohemian occupations within the creative class.

The conclusions of these writings and academic papers have led to the fact that many geographic regions, like provinces and municipalities are trying to change their image in order to attract creative human capital. For example, the Dutch province of Limburg has a long-term vision of creating a suitable environment for younger people where they can develop their ambitions which will in turn foster creativity and economic renewal (Provincie Limburg, 2005). With a similar idea in mind, the municipality of Amsterdam

had started *Bureau Broedplaatsen*, a project to economically strengthen certain dying districts, such as the IJ-banks and their Eastern Harbour by attracting bohemians in order to create synergies among cultural entrepreneurs and therewith also more employment in these districts (Gemeenteraad Amsterdam, 2000).

The question is whether these projects should be stimulated since despite the fact that many academics have found significant positive relationships between art and economic growth, there is also some noise in a different direction. Marlet (2009) concluded that in the Netherlands there is no correlation between the presence of bohemians and cultural amenities on one side and economic growth on the other side. Furthermore, Glaeser found that there is no significant connection between art museums and county growth in the U.S. (Glaeser, Kolko, & Saiz, 2001). The sounds of this camp of the academic world have led to the fact that many politicians question the use of subsidies for bohemians and cultural amenities (van der Ploeg, 2005).

The academic and social relevance of this topic certifies the importance of the attention for the relationship between creativity and economic growth. As is shown in the examples of the projects that are being undertaken in the Netherlands, some politicians and urban planners believe that if they wish to create employment growth, creating an attractive environment for creative people, and the bohemians in particular may be a relevant action from their perspective. However, although academics have found a significant correlation between cultural amenities and bohemians on one hand and economic growth on the other hand, the direction of this causality is under discussion as it may also be that economic growth stimulates creativity and not the other way around. This is illustrated by a measure by Boschma and Fritsch who concluded that there is a significant effect of regional job opportunities on the creative class (Boschma & Fritsch, 2009).

Due to the disunity among academics and politicians on the effect of the creative class on economic growth, it is an interesting topic of discussion which has therefore often been researched. Since it can never be objectively and precisely defined which workers are part of the creative class and whether these employees are truly creative, the outcomes that these researches have generated have thus far never been precise either. Furthermore, also the concept of creativity has no universal definition, leaving a lot of

uncertainty with these previous researches. Therefore, to avoid disputable outcomes as much as possible, this paper will solely test for the effect of bohemians to leave behind any uncertainty on what constitutes the creative class. Thus, the research question is:

What are the effects of bohemians on regional economic growth?

The effects of bohemians on regional economic growth have to some extent already been researched by Boschma and Fritsch, as well as by Marlet and van Woerkens (2004). Other academics, such as Lee, Florida, and Acs (2004), conducted research on the influence of bohemians on entrepreneurship which is one of the main indicators of economic development (Fritsch & Mueller, 2004; Carree & Thurik, 2003; Van Stel & Storey, 2004). The results of these studies varied from country and study, with Boschma and Fritsch testing this hypothesis in Germany and Scandinavia concluding that Bohemian Indices had a very small effect on economic growth measures, while Lee *et al.* arriving at more positive conclusions for the United States. The objective of this paper is to provide additional value to the researches that have already been done by resynthesising all this existing literature in a way in which it is broadening the geographical and theoretical bases of this subject matter to see in which specific countries and on which specific indicators of economic growth clear conclusions can be drawn regarding the effect of bohemians. Also, this paper will identify the specific aspects academic literature has not touched upon yet to give further possibilities for future academic research. Besides, by going more in-depth into the history of creativity and the growing interest in bohemians within the field of economics in particular, this paper aims to clarify where this growing interest in urban economic literature comes from in the first place.

The following sections will commence with explaining the growing importance of creativity within the field of economics while also outlining its historic relationship to bohemians. Afterwards, the creative class theory will be explained and discussed in more detail, followed by outlining several measures of economic growth and relating all of them individually with Bohemians Indices before concluding this paper by answering the research question.

Historical Background

As has been mentioned in the introduction already, this study is interesting because of the growing importance of the concept of creativity within the fields of economics and business. Creativity, which was initially related to art only, has transcended art in the twentieth century and started to be applied in other academic fields as well, such as the exact sciences, psychology and economics. According to Sternberg in his *Handbook of Creativity*, creativity is currently one of the main selection criteria for hiring people in companies (Sternberg & Lubart, 1999). Thus, it means that this particular study on the relationship between bohemians and economic growth can therefore be seen as an examination on the connection of economics to the group of people who were initially at the core of the concept that is of great importance in the contemporary economic world. This chapter will examine the conceptual history of creativity, starting with when this concept was introduced in the seventeenth century and leading to how creativity is defined and used within the field of urban economics nowadays.

In *The Rise of the Creative Class*, Florida defines creativity as the making of new approaches to problems (Florida, 2002a). Although new solutions to problems have been made for as long as mankind has existed, there were no academic terms that corresponded with creativity for many centuries. Before the seventeenth century, academics and philosophers defined the making of new things merely as developing imitations of that what already was established. Based on the ideas of Plato, academics had thought that the people who are nowadays defined as creative were making things based on the laws of nature. Hence, there was nothing inventive about them. Therefore, only in the seventeenth century, the word *creation* was used for the first time by the Polish theoretician of poetry Maciej Sarbiewsky in his dissertation *De perfecta poesi* where he writes that poets create something new. In the same essay, Sarbiewsky also speaks of the word *inventive* in its relation to poets and their work, therewith linking creativity to inventions (Sarbiewsky, 1595-1640).

Ever since the introduction of the word *creativity* by Sarbiewsky, the concept had found its way beyond poetry as well. After poetry, it was first examined in relation to visual art by art theorists, such as André Félibien and Baltasar Gracián, in the late seventeenth and

eighteenth century when speaking of painters. According to these writers, creativity had a positive connotation, for the creative person was gifted with the ability to make something tangible and valuable out of nothing. Other writers had a different approach than Félibien and Gracián. Denis Diderot rejected the idea that artists create new things out of something that is not present yet. Instead, he stated that creativity was primarily based on the act of combining existing elements into making a new whole. The existing elements he was referring to had to do with thoughts and ideas that were already out there. Hence, as opposed to Félibien and Gracián, creativity was according to Diderot not about inventing solutions out of the blue but more about the effective combination of existent ideas that together form something that has not been present before (Tatarkiewicz, 1980).

For the two centuries after, the word creativity had only been used in relation to the making of art, such as sculpting, painting and writing. Therefore, it was only linked to the group of people that are referred to as bohemians nowadays. It was in the nineteenth century when creativity stopped being seen as a synonym for art when philosophers like Bergson and Łukasiewicz were starting to discuss creativity in regard to science and nature (Tatarkiewicz, 1980).

As the concept of creativity expanded into other sciences than art in the twentieth century, it also became widely used in economics and business. One of the first economists that is known for working with the concept of creativity was Joseph Schumpeter. In his book *Capitalism, socialism and democracy*, he introduces the term creative destruction, explaining that capitalist enterprises that foster economic growth are the ones that are able to revolutionise a current economic system by destroying old structures and building new ones. New economic structures are seen by Schumpeter as a collective merger of new goods, new consumers, new markets, new methods of production and transportation, and new forms of industrial organisation (Schumpeter, 1942). Besides Schumpeter, there were other writers that helped popularising creativity among economic and business research, albeit with a more pragmatic approach. Alex Osborn introduced the concept of brainstorming as a creative problem solving technique to the mainstream public in 1953, which is now being used by businesses worldwide when fostering new ideas (Osborn, 1953). Another creative problem solving technique

that has merged with business analysis in particular is the SWOT analysis, which is an evaluation method on strengths, weaknesses, opportunities and threats of an organisation or particular project (Learned, Christensen, Andrews, & Guth, 1969).

The importance of the concept of creativity in relation to business is also underscored by William Whyte. In *The Organization Man* he writes that creativity and individuality produce better work outcomes than collectivist processes. Whyte further elaborates that, different from industrial-age employees, creative workers are on the search for metropolitan areas that are diverse and tolerant hence approving personalised activities and expression (Whyte, 1956). The theory of Whyte can therefore be linked to the creative class theory of Florida that was firstly introduced in 2002. In this theory Florida explains, going a step further than Whyte, that the population group which is defined as the creative class does not just serve as the catalyst for the production of better work inside organisations, but this group of people is also nourishing urban economic growth for the collective in general (Florida, 2002a). It should be noted, however, that according to both the definitions of Florida and Whyte, the creative class is defined as the group of people that are able to create new approaches to problems. With all this information in mind, it can be concluded that these writings assume that not just the bohemians are creative anymore, but around forty percent of the total working population.

To conclude this chapter, the definition of creativity has developed itself from art into other fields of study over the years. When the concept of creativity was initially introduced in the seventeenth century, bohemians were the only group of people that were regarded as creative by academics. After the concept of creativity was transferred from art criticism into different academic fields, such as economics and business, its definition expanded as well. With the expansion of the definition of creativity, this concept also reached a bigger group of people than just the bohemians, hence leading to the moment when forty percent of the working population is seen as creative. The development of creativity thus started with bohemians marking this group of people at the historical base of this conceptual evolution. The following chapters will continue analysing the current relation of this group of people to economic growth to see whether the influence of bohemians is still as relevant currently as it is historically.

The Creative Class Theory and the Role of Bohemians

The creative class is identified by Florida as a socioeconomic group of people whose work is to create meaningful new forms. These new forms must be economically useful and transferable. According to Florida, the creative class ranges over many different work sectors and professions. This socioeconomic group included 40 million workers in the U.S. in 2002, which was approximately 30 percent of that country's workforce at that time. In his study, Florida argued that this number was even expected to increase with ten million jobs over the next ten years, which means that by the time now this class should contain more than forty percent of the total working population. Florida states that the creative class is the leading engine of economic growth since it spurs regional economic growth through innovation (Florida, 2002a).

To identify which particular workers are part of the creative class, Florida broke the class into three main sections which were derived from Standard Occupational Classification System codes. Hence, the workers that can be classified into one of these sections are considered creative. The three main sections that were set up by Florida were:

- The super-creative core: These professionals are identified by Florida as innovative and creative. Commercial products and consumer goods are created by them. Florida argues that along with problem solving, problem finding is also entailed in their day-to-day work activities. Among this group are a wide range of occupations, within for example the fields of science, engineering, education, research, design, media and computer programming.
- Creative professionals: This group of people are, contrary to the super-creative core, not creators of goods, but they offer services instead. According to Florida, these professionals rely on complex knowledge to solve specific problems. Therefore, the majority of this group of people are usually highly educated. Examples of this category are people working in healthcare, education and consulting (Florida, 2002a).
- Bohemians: This group of people are the ones engaged in occupations of cultural and artistic form. Bohemians have two main roles. Firstly, they are part of the creative class and secondly they are a sign of a tolerant urban culture. Despite

being usually much smaller than the two other categories, Florida states that this section is a crucial part of the population, since bohemians are the ones that are attracting the two other groups of the creative class (Florida, 2002b).

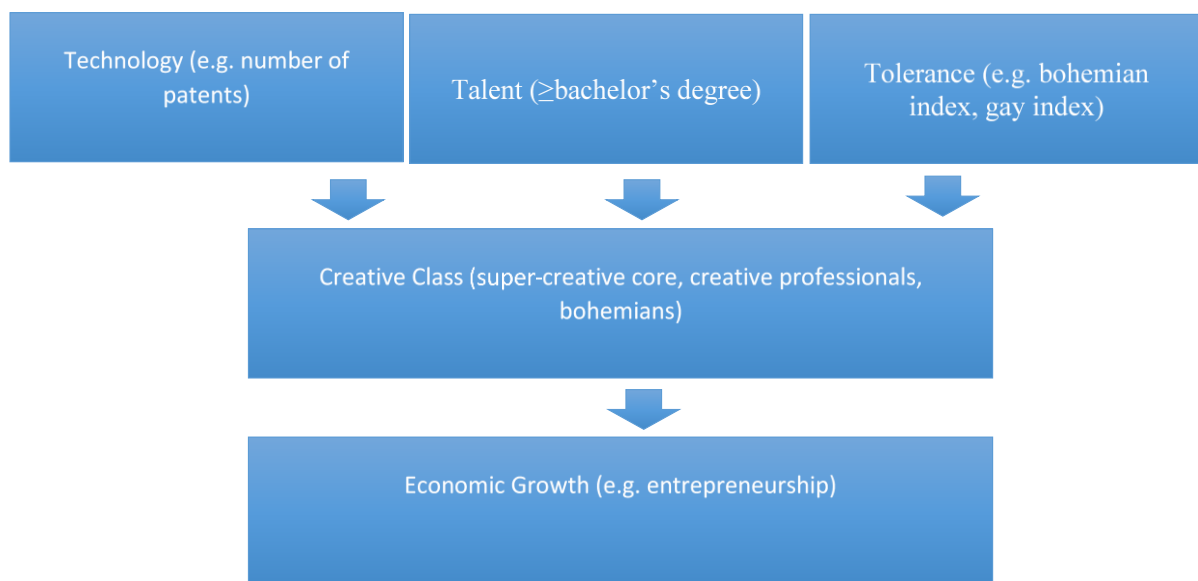
The Creative Occupations

<i>Groups of Creative People</i>	<i>Occupations (ISCO Code)</i>
Creative core	Physicists, chemists, and related professionals (211)
	Mathematicians, statisticians, and related professionals (212)
	Computing professionals (213)
	Architects, engineers, and related professionals (214)
	Life science professionals (221)
	Health professionals (except nursing) (222)
	College, university, and higher education teaching professionals (231)
	Secondary education teaching professionals (232)
	Primary and preprimary education teaching professionals (233)
	Special-education teaching professionals (234)
	Other teaching professionals (235)
	Archivists, librarians, and related information professionals (243)
	Social sciences and related professionals (244)
	Public service administrative professionals (247)
Creative professionals	Legislators, senior officials, and managers (1)
	Nursing and midwifery professionals (223)
	Business professionals (241)
	Legal professionals (242)
	Physical and engineering science associate professionals (31)
	Life science and health associate professionals (32)
	Finance and sales associate professionals (341)
	Business services agents and trade brokers (342)
	Administrative associate professionals (343)
	Police inspectors and detectives (345)
Social work associate professionals (346)	
Bohemians	Writers and creative or performing artists (245)
	Photographers and image and sound recording equipment operators (3131)
	Artistic, entertainment, and sports associate professionals (347)
	Fashion and other models (521)

The creative class with its sections and their professions

According to Florida, an attractive environment for the creative class must satisfy the three T's of economic development, the three T's being technology, talent and tolerance. Technology implies high level innovation and high concentration of technological companies and is measured by the number of patents and the amount of technical companies in an urban area. Talent is defined as the percentage of people in the city with a bachelor's degree and above. Tolerance indicates openness to race, gender, lifestyle and sexuality and it contains all diversity measures that indicate an open atmosphere. Indices that are used by Florida to measure tolerance are the Gay Index, implying the percentage of homosexuals of the total amount of people living in that area, the Bohemian Index, which is measured as the percentage of artists of the total population, and an index

indicating the percentage of foreign-born residents which is defined as the Melting Pot Index. Florida argues that when an urban area satisfies the criteria of technology, talent and tolerance, economic growth will occur, due to the the relocation of creative people into that specific area. According to Florida, economic vitality of urban areas as well as entrepreneurship are created by people directly, meaning that the three T's correlate with economic growth through the creative class as intervening variable (Florida, 2003a).



Florida's creative class theory illustrated

Based on the idea of Florida using the Bohemian Index as a measure of tolerance, one can derive that bohemians attract the rest of the creative class (Florida, 2002b). This makes them both directly and indirectly responsible for economic growth because bohemians are also one of the three categories where the creative class consists of. Using this information, the hypothesis can be developed that bohemians are exponentially causing the creative class in a specific area to grow and therewith they are also responsible for the indicators implying the economic prosperity of cities, such as entrepreneurship.

Florida's Theory Discussed

The ideas behind the theory of the creative class have been put in practice in many countries, seeing evidence in the Netherlands (Gemeenteraad Amsterdam, 2000), Denmark (Bayliss, 2007), Italy (Vanolo, 2008), and Canada (Lewis & Donald, 2009), to name a few examples. Florida's theory is also relevant nowadays because of the switched paradigm in economic geography that went from people following jobs to jobs following people (Glaeser, Kolko, & Saiz, 2001). Albeit there are also other academic theories underscoring Florida's vision, he is met with much criticism too. Both sides of the story will be discussed in this chapter.

Although Florida has helped to boost recent endeavours for building cultural cities, his philosophy is not new and can be linked to other academic sources. Both Robert Park as well as Jane Jacobs say that cities should be seen as centres for diversity, innovation and creativity (Park, Burgess, & McKenzie, 1925; Jacobs, 1984). According to Jacobs, in order to encourage its economic livelihood, a city should attract people that are diverse and creative since these people are able to connect all the knowledge and technology that is present in the city (Jacobs, 1961). As is mentioned in the previous chapter, bohemians foster economic growth in two ways. The first way is by creating a diverse atmosphere with which they are able to attract other members of the creative class. The second is by being part of the creative class themselves hence directly influencing economic growth. So, bohemians are included in both diversity as well as creativity measures, with both diversity and creativity being named by Jacobs as the variables affecting economic growth.

Despite the academic and social support for the importance of bohemians, there is also backfire on this theory. Markusen questions the causal arrow of Florida's theory saying that bohemians are not drawn to places because of artist communities, but more due to the wealthy patrons that are living there (Markusen, 2006). Hence, it is the economy that attracts bohemians, and not the other way around. Allen Scott writes that it is superficial of Florida to present the creative class theory as a causal subject matter, claiming that there are complex interrelationships between the variables within that theory that are synchronic and diachronic (Scott, 2006). Michele Hoyman concluded that tolerance

measures, including the Bohemian Index, are limited in explaining economic growth, and that university diplomas are the only factor of influence (Hoyman & Faricy, 2009). Her vision is related to Edward Glaeser's, who states that it is not creativity, but human capital that is the most important variable in predicting urban economic growth, for it are the highly educated people that have the right skillset to come up with creative ideas. With this vision, Glaeser links creativity to human capital, giving confirmation that without human capital, creativity cannot be seen as a separate cause for urban success (Glaeser, 2003). Jamie Peck is critical of the creative class theory in general, ridiculing its causal mechanism by mentioning the circular effect of bohemians on other bohemians whilst also influencing economic growth simultaneously, saying that this scenario is highly optimistic (Peck, 2005). Next to the academic critique, there is also a conceptual matter at stake. In the creative class theory, diversity measures are used to indicate tolerance, but the relationship between diversity and tolerance remains untested (Hoyman & Faricy, 2009). Tolerance is not a synonym for diversity (Sullivan, Piereson, & Marcus, 1993) and drawing conclusions on the assumption that all artists are tolerant is therefore not correct. This statement may be linked to the research of Thomas and Darnton who investigated whether diversity is indeed promoting the economic development of metropolises. They found that, as Florida suggests, diversity does matter, however the dimensions of diversity that are being touched upon by Florida, such as the Bohemian Index and the Gay Index, are in fact not strongly associated with economic development (Thomas & Darnton, 2006).

Literature Research

In the following sections, the effects of bohemians on economic growth will be analysed by combining the outcomes of several academic studies on this theme. The goal of this literature research is to test Florida's assumptions about the role of bohemians within the creative class theory. As is mentioned in the previous chapters, Florida proposes that economic growth is nourished by bohemians in two ways. The first way is direct by being part of the creative class, and the second way is indirect by attracting other members of the creative class.

To analyse whether there is a direct positive effect of bohemians on economic growth, it is first important to define what economic growth essentially means. Because the term economic growth is very broad, there are infinite ways in which this phenomenon might be defined or measured. Most of the studies that have tested the effects of bohemians on economic growth, used employment growth, gross domestic product, entrepreneurship and innovation as indicators of economic prosperity. Therefore, this paper will dedicate separate chapters to discuss the relationship between bohemians and these four indicators individually before they are combined in the overall conclusion.

After testing for the direct effect of bohemians on economic growth, the other assumption of Florida will be analysed using academic literature that examined whether people with an artistic profession are indeed positively causing other members of the creative class to live in that area. The main conclusions regarding the effects of bohemians on the creative class members will in the end be combined with the conclusions regarding the direct effects of bohemians on the separate indicators of economic growth to come to terms whether Florida's vision on the role of bohemians within the creative class theory should be certified or rejected.

Bohemians and Employment Growth

As previously discussed, Florida's theory is being criticised because some academics believe that Florida mistakenly assumes the effect of the creative class, bohemians included, to be separate from human capital (Glaeser, 2003; Hoyman & Faricy, 2009). For that reason, Glaeser (2004) and Marlet and Van Woerkens (2007) tested the effect of both human capital and bohemians on urban employment growth to conclude which of these two independent variables is of stronger influence on the increase in jobs. Employment growth is often used to indicate economic dynamism (Wojan, Lambert, & McGranaham, 2007). Both Glaeser and Marlet and van Woerkens ran several regression models, one of these regression models using human capital as the only independent variable, while the other one testing for the effect of bohemians on regional employment growth, using human capital as a control variable. The results of the papers of Glaeser and Marlet and van Woerkens will be discussed in this chapter, as well as other papers testing for the effect of bohemians on employment growth.

In Glaeser's research on 242 metropolitan areas in the United States, the influence of education is eliminated when bohemians are included in the analysis, with both human capital and bohemian measures being of 1990 and the job growth being measured over the years 1990-2000 in this research. Thus, the Bohemian Index comes out as having a much stronger effect on urban employment growth than human capital. However, this cause is entirely due to only two regions, which are Sarasota, Florida and Las Vegas, Nevada. When both Las Vegas and Sarasota are not included in this statistical analysis, human capital needs to be controlled for, and once that is done, the effect of bohemians does not provide any added value to urban employment growth (Glaeser, 2004). Another research by Donegan *et al.* on 263 metropolitan areas in the U.S. has shown that human capital, measured as the percentage of the population with a college degree and aged 25 or older in 1990, is insignificantly related to job growth over the years 1994-2003, while the bohemian count of 1990 is also insignificantly related to the variable explaining employment growth of 1994-2003 (Donegan, Drucker, Goldstein, Lowe, & Malizia, 2008).

Besides Glaeser and Donegan *et al.*, Wojan *et. al* researched the effect of bohemians on employment growth in the U.S., but then also in the non-metropolitan areas, next to the

metropolises. Also in this research, human capital was used as one of the control variables, but here it was defined as the number of college graduates from the age of 25 up and until the age of 44, meaning that graduates outside that range were not included in the count of human capital. Wojan *et al.* found that when a surplus of bohemians occurred in a non-metropolitan county, it led to faster rates of employment growth in that same area, while their results on metropolitan areas suggested the same effect, albeit being not reliable enough due to the insignificance of the bohemian variable. However, also the human capital variable proved to be insignificant in the model of urban areas, while being significant in the rural model. This indicates that bohemians probably share similar traits with young college graduates, which are not shared with college graduates that are older than 45. More research needs to be conducted to see which traits are the same between bohemians and young college graduates. Another noticeable thing from this research is that the creative class without bohemians was also used as an independent variable and this variable was significant in both the urban as well as the rural model, suggesting that Glaeser's (2003) saying that human capital in general is more influential on economic growth than the creative class might be rejected. However, since not all college graduates are included in their analysis, this cannot be done with certainty yet (Wojan, Lambert, & McGranaham, 2007).

Marlet and Van Woerkens conducted a research similar to Glaeser's, but then in the 50 largest cities in the Netherlands. Their results also found that Bohemian Indices are strongly influencing employment growth, more so than human capital. However, this effect is in its entirety caused by just one city, which is Amsterdam. When the Dutch capital is excluded from the equation, the influence of bohemians becomes insignificant (Marlet & van Woerkens, 2007). Furthermore, Stam *et al.* arrived at exactly the same conclusion as Marlet and van Woerkens, but adding that the creative class in total, bohemians included, has a stronger influence on regional employment growth than just the bohemians, with the influence of the total creative class on regional job growth still being significant when Amsterdam is excluded, but the significance level of bohemians changing from significant to insignificant with the exclusion of the Dutch capital (Stam, De Jong, & Marlet, 2008).

While Stam *et al.* tested for the effect of the total creative class on employment growth, Boschma and Fritsch ran a regression model for Dutch and German data using employment growth as a dependent variable and testing for the effect of all three sections of the creative class individually. In their outcomes, they found that in the Netherlands, all creative class categories had a significant positive influence on employment growth, while in Germany, the bohemians were the only creative class section where this influence proved to be significant. Human capital was being controlled for in their models, and its corresponding parameter was of greater magnitude than the parameter corresponding to bohemians in both countries. Moreover, in the Netherlands, the parameter belonging to bohemians had the smallest magnitude, indicating that the creative core and creative professionals are of stronger influence on employment growth in this country (Boschma & Fritsch, 2009). This research thus indicates that regarding the comparison to other creative class categories, countries might differ in which of the categories of the creative class are of stronger influence on urban employment growth since in Germany the effect of bohemians is much more important than in the Netherlands. Thus, more research in more countries needs to be conducted to get more insight into general patterns.

Next to the Netherlands, Germany and the U.S., the effect of bohemians on employment growth has also been tested in Italy and the United Kingdom. From the study of Piergiovanni *et al.* on the factors influencing regional economic growth in 103 NUTS 3 regions in Italy, the conclusion can be drawn that regional employment growth is stimulated by the growth of the share of firms in creative industries of the total amount of firms. However, in this research, human capital has not been controlled for so it is unclear whether the significance of the creative industries will remain should human capital be included in their model (Piergiovanni, Carree, & Santarelli, 2012). Also, the statistical study of Lee among 183 travel-to-work areas in Britain shows that a growth in creative industries leads to both wage and employment growth in other economic sectors. However, when rural areas are filtered out, creative industries do not increase employment growth anymore, for the variable corresponding to creative industries becomes insignificant then. This outcome is explained by the writer saying that creative industries squeeze out other economic sectors from the employment market in urban areas, but more research is required to test this assumption. Furthermore, human capital

is being controlled for in this model too, but here it is defined as *high skills* and it is measured as the people with a master's degree or above, thus including a smaller group than Florida suggests. The effect of the high skills variable proved to be insignificantly related to employment growth in all models of this research, but more research is needed to see whether the high skills variable would change to significant should bachelor graduates also be included (Lee, 2014).

What is remarkable that, it can be derived that Amsterdam holds an extraordinary powerful position among Dutch cities and towns, while Las Vegas and Sarasota have the same function in the United States. Without these cities, the effect of bohemians on urban employment growth is inexistent when controlled for the effect of education. Hence, the conclusion for both the Netherlands and the United States is that bohemians have a strong influence on regional employment growth, due to just a few cities where this effect is extremely impressive. This means that more research may be conducted on these cities that lift the effect of bohemians for the whole country to see if there are similar matters at stake that make the influence of bohemians so strong in these areas. Another interesting phenomenon is that when the studies of Wojan *et al.* and Lee are put next to each other, the influence of bohemians on employment growth is positive and significant only in rural areas in both the United Kingdom and the United States. Since the separation of urban and rural areas has not been done in other countries, it might be interesting to test whether this same conclusion that is found in the UK and the U.S. can be extrapolated to other geographic territories.

Despite studies indicating that employment growth is caused by the share of bohemians in a specific area, the causal arrow might be pointing in both ways in some countries. Boschma and Fritsch concluded from their regression analyses that in England and Wales, Finland and Sweden employment growth is causing bohemians to come a specific area, confirming the critique on Florida's assumption that this causal relationship is one-sided. Despite proof of reverse causation, the effect of employment growth on the share of bohemians is very small once other variables are controlled for in their empirical study. Interestingly, the Netherlands were also included in their analysis. However, for this country, the cause of employment growth on bohemian employment proved to be insignificant in their regression model (Boschma & Fritsch, 2009). Combining this with

the study of Marlet and Van Woerkens (2007), this might imply that in the Netherlands the causal arrow is only pointing in the way Florida suggests, however, drawing this conclusion might be dangerous since both studies might have used different ways of measuring employment growth and bohemians. All this information indicates that the causal relationship between bohemians and employment growth might be pointing two ways. However, every country might be unique for in some countries there might be a one-sided causal relationship between employment growth and bohemians. Also, if a two-sided causal relationship between these variables is found, one may also test which of these causal arrows is stronger. Therefore, more research in more countries needs to be done on these matters to answer these questions more thoroughly.

All in all, it might be concluded that bohemians have a positive influence on regional employment growth in the largest cities of the Netherlands and the U.S. due to just a few outliers, which are Amsterdam, Las Vegas and Sarasota. Without the inclusion of these cities, the effect of human capital crowds out the influence of bohemians. Also, as is concluded from the analyses of Wojan *et al.* and Stam *et al.*, the creative class in total has a stronger influence on urban employment growth than the bohemians, indicating that other categories of the creative class are of greater importance in the Netherlands and the United States. This finding is supported by the research of Boschma and Fritsch who tested this in the Netherlands. However, in Germany the bohemians are found to be the only creative class category that are of influence on employment growth. Furthermore, also in Italy the creative industries are positively influencing employment growth, although more research is required to see what will happen to this effect once human capital is being controlled for. What is also interesting to mention is that the effect of bohemians on job growth is only significant in rural areas in both the U.S. and the UK, hence indicating that bohemians are competitive with other industries in big cities, while being cooperative in rural areas. For future research it might be good to therefore separate the urban from the rural areas in other countries too to see if this phenomenon also holds in more nations. Furthermore, it might be the case that in some countries employment growth influences the stay of bohemians, which is so already in England and Wales, Finland and Sweden, but not in the Netherlands. More research in more areas needs to be conducted to see in which direction this causal arrow in each country is pointing and, if it is pointing both ways, which of the two arrows is of greater magnitude.

Bohemians and Gross Domestic Product

Gross Domestic Product, often abbreviated as GDP, is frequently used to indicate economic progress and it is a measure which is compiling the total value of all final goods and services that are being produced within a geographic region during a specific time period (Glaeser, Rosenthal, & Strange, 2010; Audretsch, Keilbach, & Lehmann, 2006). When speaking of GDP, academics either might use total GDP, GDP per capita, or GDP growth as signs of economic prosperity, with GDP per capita being the total GDP in a region divided by the number of its inhabitants, while GDP growth is operationalised by the change in percentage of the total GDP over a specific timeframe. This chapter will discuss the papers that have tested the causal relationship of bohemians on either of these three GDP measures.

Steven Rausch and Cynthia Negrey ran four regression models to test whether the different measures of diversity that Florida speaks about, such as the Bohemian Index, the Gay Index and the Melting Pot Index, are influencing economic prosperity of 276 metropolitan areas in the United States. The writers of this paper test for the GMP per capita for the year 2000, with GMP meaning Gross Metropolitan Product. To operationalise the independent variables, the writers measure the distribution of artists, gays and foreigners individually and combined of the same metropolitan areas for the year 2000. Their findings are that bohemians are the only group of people that Florida has developed a diversity measure for that are positively and significantly influencing the gross metropolitan product in all four regression models, with the Gay and Lesbian Index being only significant in one of the four regression models, and the Melting Pot Index being insignificant in all of them. Furthermore, when an educational attainment variable is added to the models, the significance level of the Bohemian Index drops from five to ten percent, while also making the value of the parameter of the Bohemian Index drop. Despite positively influencing Gross Metropolitan Product per capita, when being regressed on GMP growth for the years 2000-2004, the value of the Bohemian Index proved to be insignificant in all four models, while the three diversity measures combined and the Melting Pot Index proved to be statistically significant on a one percent level in all of the models. What is more is that, while being regressed upon GMP growth, the human capital variable was insignificant as well. Therefore, it can be concluded that in the metropolitan areas in the United States, the Bohemian Index is the only diversity

measure that is positively and significantly influencing GMP per capita, also when educational attainment is being controlled for. On the other hand, the effects of bohemians on overall GMP growth proved to be statistically insignificant (Rausch & Negrey, 2006). Similarly, Donegan *et al.* found that the Bohemian Index of 1990 is insignificantly related to GDP growth of 1994-2003 in 263 metropolitan areas in the U.S., while the human capital measure of 1990 is (Donegan, Drucker, Goldstein, Lowe, & Malizia, 2008). More research needs to be done to conclude what explains the difference in significance of human capital between these two papers.

In Canada, when testing for the influence of bohemians on total GDP of a region, the direct influence proved to have a significant but negative value. The relationship between bohemians and total GDP was shown to be only significantly positive through the intervention of other variables, such as creative class, human capital and high-tech industry clusters, hence confirming the hypothesis of Florida that there is an indirect positive influence of bohemians on the economy but rejecting the hypothesis that there is a direct positive relationship between bohemians and economic prosperity (Florida, Mellander, & Stolarick, 2010).

From their analysis on 187 cities in 15 countries in the European Union, Belitski and Desai also concluded that, controlling for human capital, people employed in artistic professions have a positive and significant effect on GDP per capita. Furthermore, culture was only one in four sectors of the employment sectors of the creative class, together with ICT, high-tech manufacturing and trade and hospitality that had such an effect on GDP per capita (Belitski & Desai, 2016). Since these results are valid for the European Union as a whole it is interesting to see how these results would be for the countries separately since this has only been done in Germany so far, where it is shown that the positive influence of bohemians on GDP per capita in urban areas is only indirect through the intervention of a variable corresponding to highly skilled and creative workers, while the direct influence of bohemians on GDP per capita proved to be negative (Tubadji, 2012).

Regarding the test of the causal relationship of bohemians on GDP growth, the only European country where this analysis has been performed in is Germany. For this country, Falck *et al.* found that in their regression models, the coefficient of the share of

bohemians is only positive and significant when human capital is not being controlled for. Also, the bohemians are found to be of influence on attracting workers with a university degree (Falck, Fritsch, & Heblich, 2009). Therefore, the results of this study are in line with Glaeser (2003) suggesting that the effect of bohemians is at most indirect in the sense that artists attract university graduates but do not have a direct effect on economic growth.

So, it can be concluded that, controlling for human capital, in the big cities of the United States and the European Union, bohemians are of positive statistical influence on GDP per capita, although in German urban areas the direct effect of bohemians on GDP per capita is negative, and the effect in this country is positive only through the intervention of the variable of the creative class. Also, the effect of bohemians on GDP growth is inexistent in the metropolitan areas of the United States, while being overshadowed by the effect of human capital in Germany. Furthermore, bohemians do have a positive effect on human capital in Germany which in turn is positively influencing regional GDP growth. In Canada, the influence of bohemians on total GDP of a region proved to be negative, while it is indirectly positive through the variables of human capital, technology and creative class. Hence, it often occurs that human capital is more influential on measures of GDP than bohemians but research in more countries is needed to see what the differences between several countries are in particular and if there are emerging patterns in regions sharing the same characteristics.

Bohemians and Entrepreneurship

From the seminal work of Schumpeter (1942) onwards, entrepreneurship has been viewed as one of the indicators of economic development. There are several ways to measure entrepreneurship, although the most common ways are through the number of new businesses registered in a specific time period, the amount of self-employed in a geographic area, or the count of small and medium sized enterprises in a specific place (Storey & Greene, 2010). In *Entrepreneurship, Creativity and Regional Economic Growth*, Richard Florida distinguishes between three different types of creativity, being technological creativity (innovation), economic creativity (entrepreneurship), and artistic or cultural creativity (bohemianism). Florida argues that these three forms of creativity are mutually dependent and reinforce one another (Florida, 2003b). So, according to Florida, if one area wants to stimulate entrepreneurship, creating good conditions for stimulating innovation, arts and culture is a relevant action that may be undertaken. Of course, this means that it also works the same way for generating more innovation, where the creation of more innovation in an area may be due to the entrance of more bohemians or to the creation of new businesses. The relationship between bohemians and entrepreneurship will be examined in this chapter, while the next chapter will focus on the relationship between bohemians and innovation.

In the creative class theory, Florida argues that diversity measures, such as the Bohemian Index are an indication of tolerance and openness. Lee *et al.* (2004) state that these diversity measures are causing entrepreneurship, because more diverse regions have low entry barriers, which makes it easier for human capital from all backgrounds to arrive and also stay within a region. In other words, the more diverse a region is, the more comparative advantage it has in attracting and retaining entrepreneurs.

Another reason why bohemians are argued to be linked to entrepreneurship, is because entrepreneurship is regarded as a form of creativity in itself. In a similar way like Florida (2003b), Sternberg and Lubart (1999) define entrepreneurship as business and entrepreneurial creativity, arguing that new businesses are often useful and original. Also, as is stated by Cattell and Butcher, creativity is best acquired when associated with other (forms of) creativity (Cattell & Butcher, 1968). Assuming that bohemians are also

creative, it may be derived that therefore a high concentration of bohemians in an area leads to more start-up clustering, which results in more business creativity and vice versa.

In *The City as an Entertainment Machine*, Lloyd *et al.* also back up the influence of bohemians on entrepreneurship saying that as a specific neighbourhood provides the right environment for bohemia to live in, entrepreneurial efforts are popping up to reform that neighbourhood into a so-called “entertainment space” since that is what bohemians long for. Examples of entrepreneurial efforts that foster this entertainment space are night spots, restaurants, art galleries and associated businesses. To confirm their statement that bohemians are causing more entrepreneurship and therewith economic growth in a neighbourhood, the writers use the rehabilitation of SoHo and the East Village in Manhattan, New York, as relevant examples where this theory was successfully put into practice. Also, in the same paper, Lloyd *et al.* argue that this new creative milieu that is being created as a result of bohemians further benefits the creative pursuits of the bohemians, since the establishment of new bohemian entertainment destinations gives this group of the creative class more possibilities to market themselves as service workers (Lloyd & Clark, 2001). The qualitative work of Markusen and King on Minneapolis–Saint Paul further confirms that the decision of artists to move to certain regions is a stimulant to new firm formation (Markusen & King, 2003).

To statistically test these theories linking entrepreneurship to bohemianism, Audretsch and Belitski performed regression analyses in 143 cities in twelve countries within the European Union to test the effect of bohemians on three measures of entrepreneurship, the three measures being new business formation, the number of self-employed, and the number of small and medium sized enterprises. They found the effect of bohemians on all three measures to be positive and significant, with an increase in the share of bohemians by one percent being associated with an average increase of urban entrepreneurship by sixteen percent. Furthermore, the impact of bohemians on these measures of entrepreneurship was four times higher than the impact of creative professionals. Another interesting outcome of this research is that the human capital variable is only significant when the bohemians and creative professionals are not

included in the model, hence indicating the creative class to be more explanatory for the cause of entrepreneurship than human capital (Audretsch & Belitski, 2013).

Furthermore, Boschma and Fritsch analysed the effect of the Bohemian Index on the general start-up rate in Germany, Norway and Sweden for the year 2002. The start-up rate being defined in their paper as the number of start-ups per 1000 inhabitants. Their results had found to be statistically significant with the bohemians positively influencing the start-up rate in all three countries. However, when comparing the regression coefficient of bohemians to the coefficient of the other two creative class categories or to the coefficient of employees with a tertiary degree, the parameter corresponding to bohemians was always smaller compared to other parameters that were significant (Boschma & Fritsch, 2009). Hence, the assumed positive effect of bohemians on entrepreneurship is there, though overshadowed by the other categories of the creative class and human capital. Besides the study of Boschma and Fritsch, similar research in Portuguese regions has shown that the influence of bohemians on the number of new firms per 1000 inhabitants proved to be insignificant (Olim, Mota, & Silva, 2015). More research on the underlying differences between the countries in Northern Europe that were included in the analysis of Boschma and Fritsch and Portugal might be interesting to explain this difference in significance.

When closely comparing the results of Boschma and Fritsch to the results of Audretsch and Belitski, who also used German, Swedish and Norwegian cities in their measures, there are some remarkable differences. From the paper of Boschma and Fritsch, it may be concluded that in German and Norwegian regions, the effect of creative professionals on the start-up rate is three to four times higher than the effect of bohemians, while from the paper of Audretsch and Belitski the effect of creative professionals was found to be four times lower compared to the effect of bohemians. Another remarkable difference is the change from being significant to being insignificant of the human capital variable when bohemians and creative professionals are included in the paper of Audretsch and Belitski, while human capital stays influential with the inclusion of the creative class categories in Boschma and Fritsch's paper. The difference between the outcomes of these papers can be explained by the fact that Audretsch and Belitski tested the influence in the cities that were presumably led by entrepreneurship, innovation and knowledge

spillovers already, while Boschma and Fritsch included all regions in their analysis, not filtering out the ones with less economic dynamism. Therefore, one can derive that the influence of bohemians on entrepreneurship is especially felt more in cities with more economic activity, while this influence is less felt in smaller regions where the other creative class sections and human capital play a bigger role on influencing entrepreneurship.

Moreover, entrepreneurship might be a cause and a conduit of bohemianism, next to being an effect. Fritsch and Rusakova showed from their analysis in Germany that entrepreneurs are more involved in cultural creativity than non-entrepreneurs as they attach a higher value to artistic experiences and they attend cultural events, like concerts and theatre performances, more frequently than their employed counterparts (Fritsch & Rusakova, 2010). Hence, entrepreneurs patronise bohemians more than non-entrepreneurs, at least in Germany. Furthermore, Belitski and Desai found on their research in the biggest cities in Europe that entrepreneurship also serves as a conduit when bohemians are being regressed upon GDP per capita. When a variable of entrepreneurship is included and multiplied with the variable corresponding to bohemians, the size of the influence of bohemians on GDP per capita is reduced. These findings imply that when entrepreneurs interact with bohemians, knowledge spillovers are created leading to a higher GDP per capita than when bohemians are not interacting with entrepreneurs (Belitski & Desai, 2016).

Besides coinciding on a regional level, entrepreneurship and bohemians also highly relate on an individual level, which is derived from a statistical analysis on German data by Fritsch and Sorgner. Firstly they found that people in an artistic profession are more likely to be self-employed than people in other sections of the creative class. Another finding in their paper is that the presence of the creative class in a region has a strong effect on a person's individual decision to start his or her own company, with the presence of bohemians to be of stronger influence on that decision than the presence of the other two categories of the creative class (Fritsch & Sorgner, 2013). More research in more countries needs to be done to see if these results also apply for other countries.

Outside of Europe, Lee *et al.* performed an analysis on the effect of bohemians on new firm formation in the metropolitan areas in the United States. Their statistical results concluded that the Bohemian Index is the variable that correlates most with firm birth, more so than other variables that are also assumed to be linked to entrepreneurship, such as human capital, population growth, income growth, number of patents, and other indices of diversity, like the Gay Index. Also, in the same research, their hypothesis is confirmed that after performing several regression analyses, when controlling for variables such as human capital, population growth and income growth, bohemians indeed have a strong, positive and significant causal effect on firm birth (Lee, Florida, & Acs, 2004). Similarly, Qian *et al.*, also performing their research in U.S. metropolitan areas, regressed entrepreneurship on several variables, such as tolerance, with tolerance being measured as a combined Bohemian Index and Gay Index. Their conclusion was that their tolerance variable influences the number of new firms per 1000 inhabitants in two ways, with the two ways being direct, and indirect through the intervening variable of human capital, measured as the percentage of adults holding a bachelor's degree (Qian, Acs, & Stough, 2012). However, it is unclear whether the causal influence will be the same when the Bohemian Index is separated from the Gay Index. Furthermore, Wojan *et al.* found that bohemians have a positive effect on the number of business establishments in the non-metropolitan areas in the U.S., with human capital being insignificant. Albeit when testing the same effect in the metropolitan counties, the effect of bohemians on the change in business establishments was insignificant (Wojan, Lambert, & McGranaham, 2007). It is interesting to test here what explains the difference between the outcomes of the research of Wojan *et al.* in the U.S. on one hand, and the researches of Lee *et al.* and Qian *et al.* on the other hand that makes the difference in significance for bohemians on new firm formation for U.S. metropolitan areas.

Although all this literature suggests that there is a link between a region's artistic milieu and the formation of new enterprises, these theories have been contrasted with other theories that focus more on the hypothesis that individual opportunity structures are the most important in explaining new firm formation. Examples of what is meant with individual opportunity structures are a person's financial resources, social status, age and level of education. Several academics have tested the effect of individual opportunity structures on entrepreneurship, and found a significant relationship between these

variables (Aldrich & Waldinger, 1990; Bates, 2006; Fischer & Massey, 2000). Since the influence of these individual opportunity structures on entrepreneurship has only been compared to the influence of bohemians in Germany so far with the conclusion that the regional share in an artistic profession is of greater positive influence on an individual's decision to start a business than for instance an individual's age, years of formal education or gender (Fritsch & Sorgner, 2013), it is interesting to do this in other countries as well to see what factors are of greater influence on entrepreneurship.

All in all, many academic theories have linked creativity and bohemianism, both directly and indirectly, to entrepreneurship. Therefore, it is quite explanatory that Florida is so confident about the existence of this relationship. Statistically, it can be derived that in the European cities with most economic dynamism, the influence of bohemians on entrepreneurship is stronger than the influence of other creative class categories or human capital. However, for cities which are not among the most economically prosperous, the effect of bohemians on entrepreneurship is much weaker than the effect of higher educated or of other creative class members. This indicates that synergies and collaborations between bohemians and entrepreneurs are likely in large cities only, which is to some extent confirmed by the tests of Fritsch and Rusakova and Belitski and Desai respectively, who concluded that entrepreneurs patronise bohemians more than non-entrepreneurs (in Germany) and that entrepreneurship serves as a conduit when bohemians are regressed on GDP per capita in European big cities. Also, when both economically viable and smaller regions are taken into account, bohemians have a small significant influence on entrepreneurship in Germany, Norway and Sweden as a whole, while being insignificant in Portugal. More research is suggested to come to a clear conclusion about this difference in significance. Furthermore it can be concluded for Germany at least that besides coinciding on a regional economic level, entrepreneurs and bohemians also relate on an individual level, because bohemians are more likely to be self-employed than super-creatives or creative professionals and their presence is of positive significant influence on the decision of non-bohemians to start their own business. Moreover, from American data (Lee, Florida, & Acs, 2004; Qian, Acs, & Stough, 2012) it is shown that, when being controlled for human capital, bohemians cause entrepreneurship both directly, as well as indirectly through the intervening variable of human capital with the magnitude of the effect of bohemians to be strong. However, the

results of the paper of Wojan *et al.* are opposing these outcomes for U.S. metropolitan areas, as they conclude that the effect of bohemians on new firm formation is insignificant instead. Therefore, more research is needed to explain these differences in outcome. Furthermore, since traditional literature is usually using individual opportunity structures as explanatory variables for entrepreneurship, it might also be interesting to statistically compare which of these opportunity structures are of stronger or weaker influence on entrepreneurship than bohemianism since this has only been done in Germany so far where the region's share of bohemians is found to be more influential than all individual opportunity structures. To conclude, it must be noted that, although much literature suggests that entrepreneurship is an indicator of economic growth (Fritsch & Mueller, 2004; Carree & Thurik, 2003; Van Stel & Storey, 2004), there is also some that contradicts this statement. Entrepreneurship is a broad concept that can be broken down into sections. Some literature has done that, concluding that only specific sections of entrepreneurs are responsible for economic growth, while the other ones are not (Wong, Ho, & Autio, 2005; Baumol, 1990). Therefore, one must be careful when using entrepreneurship as a synonym for economic growth.

Bohemians and Innovation

Innovation is another measure of economic development where bohemians have been regressed upon in academic research testing the creative class theory. Innovation is defined as the usage of improved solutions meeting new requirements and unstated and existing market needs (Maranville, 1992), and it is seen as an indicator of economic growth (Rosenberg, 2004). Since innovations are often revealed through engineering processes, they are usually related with high-technology industries and are therefore measured by the number of patents, while other academics have used levels of high-technology clustering to measure innovations. Other measures of innovation include input measures, such as R&D expenditures, and other intermediate output measures that are similar to patents, like copyright rights and trademark rights. Since copyright rights come into existence automatically when most works of art, like films or songs, are being created, it is too obvious to regress on this measure of innovation. There are also measures of innovation that are more direct by surveying businesses about their innovative activities (Storey & Greene, 2010). This chapter will look for the statistical relationships that have been examined between bohemians and these measures of innovation. As is the case with entrepreneurship, Florida and related researches argue that bohemians foster innovation because bohemians are an indicator of tolerance and low entry barriers, facilitating the arrival and development of high-tech industries (Lee, Florida, & Acs, 2004).

When looking at the Gini coefficients Boschma and Fritsch gathered, the conclusion can be drawn that in the Western European countries they studied, the spatial concentration of bohemians is about equal to the spatial concentration of high technology industries, while the other categories of the creative class and the higher educated people tend to be more distributed. However, the low correlation coefficients of the high Gini coefficients of high technology industries and bohemians suggest a low level of spatial coincidence of artistic occupations and high-technology employment, making causation between bohemians and innovation highly unlikely. Later in their paper, the duo ran a separate regression model to test for the effect of the creative class on innovation in Germany, innovation being measured as the number of patents per 1000 inhabitants. According to that regression model, the coefficient that corresponds with bohemians concluded to be

insignificant, meaning that there is a weak or non-existent relationship between patenting and artistic occupations (Boschma & Fritsch, 2009). Similarly, in his research on U.S. cities, Florida observed that the Bohemian Index correlates with the Innovation Index, which is defined in his study as a measure of patents per capita of the last ten years, at the value of 0.60, being statistically significant (Florida, 2003b). However, despite being correlated at first, later multivariate regression on primary metropolitan statistical areas of the United States proved that the Bohemian Index was insignificantly related with the amount of patents per 100000 inhabitants (Knudsen, Florida, Gates, & Stolarick, 2007).

The results of the researches of bohemians on patenting are not surprising, because, first of all, most artistic works cannot be patented. Also, as has been mentioned in other literature, not all innovations are patented or patentable, pointing to the limitations for using patent count data for measuring innovations (Griliches, 1990). It is therefore not sufficient to use patenting as the only measure of innovation, for some innovations, like service innovations, do not need to be generated through any technological know-how (Hipp & Grupp, 2005). However, further investigating the limitations of using patents as a measure for innovation goes beyond the scope of this research since the primary goal of this paper is to test Florida's assumptions on the role of bohemians within the creative class model.

Besides patent count data, other measures of innovation include measures of high-technology concentration and growth. Florida and Gates performed several correlation and regression analyses in the 50 biggest metropolitan areas in the United States to test for statistical relationships between various diversity measures, Bohemian Index included, and measures of high-technology industry concentration and growth. To get at the relationship between technology and creativity, the receptiveness to bohemians of a specific metropolitan area was examined. The correlation between the Bohemian Index and the tech ranking of the metropolitan areas proved to be strong, with ten of the fifteen areas with the highest concentration of bohemians appearing in the top fifteen of the high-technology areas. Furthermore, the results of their multivariate regression analysis back up that bohemians predict the concentration of high-tech industries in the United States, since the Bohemian Index is positively and significantly associated with the Tech-

Pole ranking measuring high-technology concentration. Although a positive and significant causal relationship had been found of bohemians on high-tech industry concentration, the relationship between bohemians and high-tech industry growth proved to be insignificant (Florida & Gates, 2005). A similar conclusion can be drawn for Canada, where arts and culture occupations have a positive and significant effect on the share of high-tech employment in a region (Florida, Mellander, & Stolarick, 2010). While it is undeniable that more research is required to examine the causal linkages between diversity and high-tech industries, these researches support the hypothesis that low entry barriers and tolerance help attracting high-technology industries, at least in North America.

However, despite the strong relationship between high-tech clustering and bohemians in the U.S. and Canada, Clifton and Cooke found that this association is not as strong in Western Europe. One of the explanations that is given for this phenomenon is that in Europe, the distances between cities are smaller, meaning that in North America it is more likely that both high-technology entrepreneurs as well as bohemians will cluster in the same cities. In Western Europe, by contrast, bohemians tend to cluster more in capital cities, while technology clusters are more common in university cities, such as Cambridge, Lund or Turku, which do not have a high concentration of bohemian population (Clifton & Cooke, 2009).

Different from testing the influence of bohemians on innovation of the geographic region in its whole, Stam *et al.* performed a qualitative analysis to test whether small and medium sized enterprises (SMEs) in creative industries were more innovative than SMEs in other sectors. Stam *et al.* broke down the creative industries into three domains, being arts, media and publishing, and creative business services. Their analysis was performed among Dutch firms in the years 2004-2006 and the researches use the definition of innovation employed by the Business Process Survey (BPS) provided by EIM Business and Policy Research, a research institute from the Netherlands. The definition of the BPS is much broader than the definition of innovation from solely a technological point of view, as they define innovation as all products and processes that are new and which goal it is to give the company some kind of economic benefit. Stam *et al.* found that the share of firms with new products, services and distribution systems is higher in creative

industries than in other industries, while the results on process innovation proved to be insignificant. Furthermore, creative firms report their innovation plans more often, use external networks to exchange knowledge more frequently, they cooperate more with other firms to develop innovations and they employ specialised innovation workers more than firms in other sectors. Furthermore, the same paper has shown that creative firms in urban areas performed better than creative firms in rural areas on all aspects of innovation (Stam, De Jong, & Marlet, 2008). To extrapolate these results, the suggestion is here to perform this analysis in other countries as well.

So, research on German and American data has shown that bohemians are insignificantly related to the number of patents per capita. This outcome is far from surprising because most artistic works are not patentable. Furthermore, it can be concluded that in the United States and Canada, bohemians are positively influencing the concentration of high-tech industries, but (at least in the United States) are insignificantly related to high-tech industry growth. In Europe, however, high-tech clustering is not affected by bohemians as much, with the difference in outcomes between Europe and North America explained by the fact that the spatial distance among North American cities is bigger so bohemians and high-tech companies cluster in the same city, while in Europe bohemians tend to choose for capital cities and high-tech industries prefer university cities to locate in. Future research on the underlying mechanisms is suggested to come to clearer conclusions regarding these outcomes. Also, from survey data in the Netherlands, the conclusion can be drawn that creative companies are more innovative than companies in other industries. The suggestion is here to perform this same analysis in other countries to see whether this conclusion holds there as well. As a final note it must be said that although innovation is seen as an indicator of economic growth by many academics, when looking at Florida's model, it may be argued that it is more appropriate to use innovation as an indicator of technology, hence arguing that innovation may also be a cause of bohemians besides being an effect. Markoff's book on the historical developments of the technology in Silicon Valley elaborates on the two-sided relationship between bohemians and technology saying that artists and technological innovators influence one another (Markoff, 2005). However, since academic literature has insufficiently tested the reverse causal relationship of this issue, no adequate conclusions can be drawn on this matter.

Bohemians and Other Creative Class Members

Besides directly affecting economic growth by being part of the creative class, Florida suggests that bohemians are also indirectly causing the economy of a region to grow by attracting other members of the creative class by ensuring a tolerant atmosphere. Despite his suggestions, the direction of this causal relationship remains questionable (Markusen, 2006). This chapter will therefore outline the papers that have researched this association to see whether there is indeed a relationship between bohemians and other creative class members to begin with, and, if there is any, in which direction the causal arrow is pointing.

Boschma and Fritsch were able to clarify the causal relationship between bohemians and the other members of the creative class. After performing their regression analyses, they found that, in six out of seven countries they studied, there was a strong significant positive causal relationship of the share of artists in an area on the same area's share of creative professionals and creative core. This confirms Florida's hypothesis at least for England and Wales, Finland, Germany, Norway, the Netherlands, and Sweden. Another notable outcome of their study is the fact that the parameter that corresponds to the share of bohemians is much higher when using share of super-creative core employment as a dependent variable than when bohemians are regressed on the share of creative professionals, indicating the influence of bohemians on creative core members to be much stronger than on creative professionals. However, once the bohemians are omitted from the regression models, only a small decline in the explained variance is noticed, meaning that other economic variables play a bigger role in explaining the creative class. Another finding in their research is that the *cultural opportunity index*, which is explained in their paper as the share of the working population in recreational or cultural activities is of very strong influence on explaining the share of bohemians in an area, hinting that bohemians attract other bohemians (Boschma & Fritsch, 2009). This outcome may be linked to the behavioural hypothesis of Markusen and Schrock who claim that other artists are the group of people that are most likely to patronise bohemians (Markusen & Schrock, 2006). However, it can obviously not be ruled out that there is a share of bohemians working in cultural industries in particular, causing overlap between these variables and hence explaining these strong parameters. What is also interesting to

mention is that in the research of Boschma and Fritsch, Bohemian Indices have a stronger parameter than employment growth in all their regression models, meaning that bohemians are of stronger influence on attracting other members of the creative class than employment opportunities (Boschma & Fritsch, 2009). However, a possible downside of the measures of Boschma and Fritsch is that human capital is not being controlled for in the regression analysis testing the effects of bohemians on the rest of the creative class. Other research among 323 NUTS 3 regions in West Germany for the period 1975 to 2004 had namely found that when human capital is used as a control variable, the effect of bohemians on other members of the creative class becomes insignificant (Möller & Tubadji, 2009). To conclude whether these results also apply to other countries Boschma and Fritsch have tested this relationship for, more research has to be performed.

Despite the research of Boschma and Fritsch proving that bohemians attract other members of the creative class, more detailed research by Andersen *et al.* in the Scandinavian countries has shown that this influence is only statistically significant in city regions with a population between 50000 and 100000 people, while the effect of bohemians on the rest of the creative class in city regions with smaller and larger populations proved to be insignificant. This finding for Scandinavia is explained by the typical hierarchy of city regions in Nordic countries, with usually one major capital and a few large city regions per country. Due to this hierarchy, many Nordic creative class members choose to live in the capitals or the other few large cities since that might be the only chance for them to build successful careers. Thus, the effect of the presence of a thick labour market crowds out the effect of the presence of bohemians in these large city areas (Andersen, Hansen, Isaksen, & Raunio, 2010).

Wojan *et al.* tested whether bohemians are attracting the rest of the creative class in the United States, the rest of the creative class being defined as all people employed in the professions that Florida has considered to be part of the creative class minus bohemians. They found that in both urban and rural areas, this effect was positive and significant, even when controlled for other variables such as human capital, population change and age. Furthermore, the magnitude of the variable corresponding to bohemians even suggests that in both metropolitan as well as in non-metropolitan areas, the presence of

artists is a critical asset in urban development strategies aimed at attracting the creative class (Wojan, Lambert, & McGranaham, 2007).

Some researches even argue that the influence of bohemians on economic growth is only indirect through the creative class. For instance, in research on Canadian regions, the effect of the Self-Expression Index, measured as a combination of the Bohemian Index and the Gay Index with both indices given a weight of 0.5, proved to be positive and significant on regional income (GDP), but through the intervening variables of human capital, technology and the creative class, thus in a way confirming Florida's assumption that the influence of bohemians and gays is indirect through the creative class variable. Furthermore, the direct influence of the Self-Expression Index on GDP is negative, while the direct effect of creative class and human capital on GDP is positive. Also, as is the case with the European countries included in the analysis of Boschma and Fritsch, the effect of self-expression proved to be stronger on the super-creatives than on creative professionals (Florida, Mellander, & Stolarick, 2010). Similarly, in German urban regions, bohemians are found to be significantly positively influencing the composition of high-skilled and creative workers. However, as is the case in Canada, bohemians have a direct negative influence on GDP per capita in Germany too. This finding is explained by Tubadji with the argument that bohemians are negatively influencing the efficiency of these human capital workers (Tubadji, 2012). However, this statement of Tubadji has not been tested so no adequate conclusions can be drawn yet.

Besides Florida's suggestion that the causal arrow is pointing from bohemians to other members of the creative class, some academics focus more on this causation in a reverse direction. To illustrate this matter, Scott's book *On Hollywood* is highlighting the effect of some creative class industries other than the arts to be of major influence on the presence of bohemians (Scott, 2005). However, when looking at Florida's theory closely, one may arrive at the conclusion that, also in Florida's model, other creative class categories are causing the presence of bohemians since some members of either the super-creative core or creative professionals might be included in the technology or talent section of the creative class model. It is undeniable that some, if not many, members of creative class section are working in high-technology industries, or that they have tertiary degrees. Hence, the conclusion can be drawn that the causal arrow is pointing in two directions.

The studies of Becker and Rodgers focus on this two-sided causal mechanism, stating that artists are extraordinarily networked with other artists as well as with workers in other sectors (Becker, 1982; Rodgers, 1989). Despite deriving a two-sided causal relationship, more quantitative research needs to be done to test whether the influence of bohemians on the creative class is stronger or weaker than its reverse influence, since no literature has touched upon this matter yet.

To conclude, all this information implies that bohemians are indeed positively causing other members of the creative class to come to a specific area, with the influence of bohemians on the super-creative core to be stronger than on creative professionals in North-West Europe and Canada. However, when human capital is used as a control variable, the effect of bohemians on other creative class members becomes insignificant in West-Germany. More research needs to be done to see for which countries the same conclusion applies. Also, the presence of bohemians happens to be more important in explaining the presence of the creative class than employment opportunities in Germany, England and Wales, the Netherlands and Scandinavia, although when taking a closer look at the Scandinavian data, the found overall effect of bohemians on the creative class is due to the medium-sized cities, while in the larger cities employment opportunities are of more importance. It is not tested whether this same conclusion can be extrapolated to other geographic territories. Also, the effect of bohemians reinforcing other bohemians happens to be extremely strong in North-West Europe. Moreover, in the U.S., bohemians are found to be of positive significant influence on the presence of the other members of the creative class in both metropolitan as well as rural areas, even when human capital is being controlled for. It is also found that there are even some countries where the effect of bohemians on GDP (per capita) happens to be only through the creative class, like Canada and Germany. At last, as has been implied in Florida's theory as well as in other literature, the causal arrow might be pointing from other creative class categories to bohemians as well with no quantitative research testing for (the relative strength of) these causal arrows yet.

Conclusion

The social and academic relevance of this research has been underscored by the growing importance of the concept of creativity within the economic domain throughout the last century. Creativity, which was initially a concept that was seen as a synonym for art and bohemianism only, has now developed itself beyond the scope of art into other fields of study, in this case being economics. This research may therefore be seen as an attempt to justify the initial core values of this concept in regard to its current positive connotation with economic growth.

The way in which the abovementioned objective has been analysed is by testing Florida's hypotheses on the influence of bohemians on economic growth within the scope of his own creative class theory. As Florida states, bohemians foster economic growth in two ways. The first way is indirect by creating a diverse atmosphere in a specific geographic region which attracts the other two categories of the creative class which in turn positively influences economic growth measures. The second way is direct by being also one of the categories of the creative class. To answer the research question of this paper, regional economic growth has been broken down into several indicators to provide more clarity on the existing literature that has tested the assumptions of Florida regarding bohemians within the creative class theory. Also, by breaking down this conclusion into different aspects of economic growth, this paper aims to take away the unclarity that might be caused by the broad definition of this concept. The four indicators of economic growth on which sufficient quantitative research has been performed in its relation to bohemians to draw conclusions on are employment growth, gross domestic product, entrepreneurship and innovation. Furthermore, this paper also resynthesized the papers that were of profound enough quality that tested the effect of bohemians onto other members of the creative class.

Regarding employment growth, bohemians are found to be of positive influence in rural areas in the UK and the U.S. while being only positively influencing in urban areas in the U.S. and the Netherlands due to three cities that are extreme outliers. The explanation that might be given for this is that in most urban areas creative industries are competing with other industries, hence squeezing out employment. When comparing bohemians to

other members of the creative class and human capital, bohemians are usually of smaller influence on employment growth than these other factors, with the exception of Germany, hence being more in line with Glaeser than with Florida with the former saying that human capital is more explanatory on economic growth measures than bohemianism. Also, in some European countries, the effect of bohemians on employment growth is found to be two-sided, thus confirming the critique on Florida about the mistakenly assumed one-sidedness of this causality.

Speaking of gross domestic product, it is found that bohemians are of positive influence on GDP per capita in the EU and the U.S., although this influence might be caused by the intervening variables of human capital or creative class, with the direct effect of bohemians on GDP per capita even being negative in Germany. Regarding GDP growth, the influence of bohemians on this variable is not statistically significant in the U.S., while being crowded out by human capital in Germany. The only country where the effect of bohemians on total regional GDP has been measured for is Canada, where the direct effect is significantly negative, but positive through the intervening variables of talent, technology and creative class. So, also on this measure of economic growth, the conclusion can be drawn that in all the countries where this measure has been tested with bohemians, the effect of bohemians proved to be overshadowed by the effect of human capital, hence rejecting Florida's hypothesis.

When testing on entrepreneurship, bohemians are found to be more influential on entrepreneurship than other creative class categories or human capital in the largest urban areas in Europe, while in areas with less economic dynamism the influence of bohemians is weaker. Hence, only for large cities in Europe, the statement of Florida that artistic creativity and economic creativity are both reinforcing each other can be accepted with certainty. Research on U.S. metropolitan areas proved to have ambiguous results, so no final conclusion can be drawn on this country.

Speaking of the influence of bohemians on measures of innovation, bohemians are found to be insignificantly related to patent count data. Moreover, it is shown that in North America, bohemians are positively related to high-tech clustering, while the effect in Europe on this same measure is smaller. This finding is explained by the difference

between these continents in average spatial distance between two cities. Hence, only in North America Florida's statement that technological and artistic creativity are mutually dependent can be verified.

At last, bohemians are found to be influential on attracting other members of the creative class in Europe, the U.S. and Canada, with the influence on super-creatives to be of stronger magnitude than the influence on the creative professionals. Therefore, the hypothesis of Florida that bohemians are causing other members of the creative class to come to a specific area can be confirmed for the countries studied. An interesting phenomenon is observed in Scandinavia, where this influence is only significant due to the medium-sized cities.

Besides the limitations that have been touched upon in previous chapters, there are also more general limitations that are relevant mentioning. First of all, it is noticeable that all literature that has been studied for this research has focused on European and North American data. This is mainly due to the inexistence of data covering the effect of bohemians on measures of economic growth or on other creative class members in other economies. Although the creative class theory has been tested in China for instance (Florida, Mellander, & Qian, 2008), no conclusions regarding bohemians in particular can be drawn for this country due to lack of data. Another possible limitation of this paper is its focus on only the quantitative effect of art in relation to economic growth. As Markusen and Schrock have mentioned, art is also providing dividends that are not quantifiably measurable, such as psychic gratification, social consciousness and personal motivation (Markusen & Schrock, 2006). Solely focusing on the quantitative effect of artists on economic growth might therefore be limiting in explaining their value. Another limitation of this paper is that there are also other measures of culture than just bohemianism or people working in the creative sector, however these have insufficiently been tested with economic growth measures to do a literature research on. Furthermore, the interpretation of bohemians among academics might be varied, making academics selective in what they include and do not include in their measures (Stam, De Jong, & Marlet, 2008). Also, Florida's theory lacks clarity, especially regarding economic growth since he did not give a well-stated definition of this concept within his theory. Another lack of clarity within Florida's theory is the fact that he has concluded that some

occupations are part of the creative class because they *generally* require creativity, with *generally* obviously not meaning always (McGranahan & Wojan, 2007). Furthermore, it might be difficult to quantitatively measure a subjective concept like creativity. Even when bearing in mind Florida's definition of creativity, which is being able to come up with new approaches to problems, the classification of creative occupations might differ from researcher to researcher, hence possibly causing immense variation in academic research outcomes on the creative class, even when the research has been performed in the same areas and in the same time periods.

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