Arbeiten aus dem

OSTEUROPA-INSTITUT
REGENSBURG

Wirtschaftswissenschaftliche Abteilung

Working Papers

Nr. 270 Dezember 2008

The Creative Class, Bohemians and Local Labor Market Performance -
A Micro-data Panel Study for Germany 1975-2004

Joachim MÖLLER* and Annie TUBADJI**

* Correspondence to: Joachim Möller, Institute for Employment Research (IAB), IZA and University of Regensburg,

** Annie Tubadji, Osteuropa-Institut und. Institute for Employment Research (IAB),

OSTEUROPA-INSTITUT
REGENSBURG

Landshuter Str. 4
93047 Regensburg
Telefon: 0941 943 5410
Telefax: 0941 943 5427
E-Mail: oei@osteuropa-institut.de
Internet: www.osteuropa-institut.de

ISBN 978-3-938980-19-4

Contents

List of Tables

List of Figures

Abstract

The paper aims at testing Florida's concept of the Creative Class using panel data for 323 West German regions for the time period 1975 – 2004. We apply two different estimation methods, a panel VAR for the complete data set and a dynamic system approach based on GMM for a modified data set collapsed to six five-year periods.

We find that the local concentration of the Creative Class has predictive power for the economic development of a region and tends to outperform traditional indicators of human capital. However, our results do not support Florida's assertion that the creative workers flock where the Bohemians are. According to our findings, the Creative Class is attracted by favorable economic conditions as indicated by employment growth or an increasing wage bill.

JEL-classification: Z10, C23, R1, O1, O3

*Keywords***:** Culture, Regional Development, Bohemians, Creative Class, Dynamic Panel Methods

Introduction

The influence of culture on local growth and development is one of the most debated themes of regional economics in the last five or ten years. Especially Richard Florida's bestseller *The Rise of the Creative Class* (Florida 2002a) has led to a highly controversial discussion inside and outside the discipline. For many observers the concept is attractive with its plea for diversity and cultural richness as a prerequisite for superior economic performance in a knowledge society. The cornerstones of Richard Florida's concept are appealing for policy makers, both on the local as well as on the national or supernational level[1]. Yet, the unconventional ideas have been subject not only to exalted applause of decent disciples, but also faced many critics and attacks. The tone of some of Florida's opponents led the author to writing his reply 'The Revenge of the Squelcher'. In his review of Florida's main work Glaeser (2005: 593) states that: "The natural response of an academic to seeing a fellow academic experience such success is, of course, unbridled envy". Although there might be enough scope for reasonable criticism, Glaeser argues for taking the concept seriously. In the passionate debate over the 'blessing' or 'curse' of the Creative Class[2] the untested assumptions in Florida's argumentation and possible deficiencies in his or his follower's empirical methodology are sometimes overlooked. Therefore it is important to scrutinize the role of creative persons for local growth and development as well as to investigate factors that might lead to a local concentration of creative workers.

The adherents of Florida's concept can be divided into the 'believers' and academic supporters. Among the 'believers' are urban administrators, politicians and other decision makers who draw a justification of alternative forms of investments, in cultural amenities and events, for instance. The academic advocates try to strengthen the theoretical basis of the creativity concept and look for sound empirical strategies to corroborate the main assertions. However, little has been done in order to obtain "hard" econometric testing of the major assumptions underlying his concept.

The aim of our paper is to shed some light on the basic relationships asserted by the creative-class concept using a large German micro panel data set and applying (dynamic) panel data methods. The remainder of the paper is structured as follows: In the next section we survey the pros and the cons of Florida's concept as viewed in a fast growing strand of theoretical and empirical literature. Section 3 provides an outline of the data source and gives some descriptive evidence. In section 4 we present our estimation strategy and the achieved econometric results. Section 5 concludes.

[1] As an indication of the latter, the European Commission has recently launched a research agenda on the role of culture and the EU's cultural industries as a booster of creativity, innovation and growth in the EU (European Commission 2008).

[2] See, for instance, Malanga (2004).

1 The concept and previous studies

1.1 Florida's concept of the Creative Class

We start with briefly sketching the original lines of thinking being elaborated in Florida's monographies on the Creative Class (Florida 2002a, 2005) and in a series of articles together with coauthors (Florida and Gates 2001, Florida 2002b, 2004, Lee et al. 2004, Knudsen et al. 2005). Florida concept builds on classical contributions on bohemia as well as on urban development pioneers such as Jacobs (1961) who recognize creativity and diversity as 'engines' for city growth. Florida's notion of creativity goes beyond the technological, information and knowledge aspects of it. Activating the full potential of this key factor for economic development would require harnessing creativity in all its forms (Florida 2002a).

According to Florida, the Creative Class possesses a specific type of human capital being associated with high level creative skills. This group consists of two parts: the creative core and the creative professionals. The creative core includes:

"… scientists and engineers, university professors, poets and novelists, artists, entertainers, actors, designers and architects, as well as the thought leadership of modern society: nonfiction writers, editors, cultural figures, think-thank researchers, analysts and other opinion makers. Whether they are software programmers or engineers, architects or filmmakers, they fully engage in the creative process…" (Florida 2002a:69)

The creative core produces a climate in which new ideas, blue prints, forms and designs are generated that are readily transferable into new products or services. The transferability depends on a further specific group of workers, the creative professionals. This group is able to support the implementation of the innovative process. It encompasses an ample range of professional activities. According to Florida creative professionals can be found especially in knowledge-intensive industries such as high-tech sectors, financial services, the legal and health care professions, and business management. What characterizes these specialists is that they:

> "… engage in creative problem solving, drawing on complex bodies of knowledge to solve specific problems. … They apply or combine standard approaches in unique ways to fit the situation, exercise a great deal of judgment, perhaps try something radically new from time to time." (Florida 2002a: 69).

The author stresses that being a creative professional typically requires a high degree of formal education. Typical examples are "… physicians, lawyers and managers and also a growing number of technicians…" (Florida 2002a: 69). The presence of the Creative Class triggers knowledge spillovers which generate synergies for endogenous growth (Knudsen et al. 2007).

An important aspect is the mobility of the Creative Class. Florida emphasizes that monetary incentives have only a limited effect, because creative workers are motivated primarily intrinsically and value individuality, challenge and responsibility. Hence these people cannot be attracted by offering high salaries or stock options alone. Factors that are perhaps more decisive are the cultural amenities in a location and a diverse and open

milieu (see Florida 2002a, 2004). For the latter the presence of Bohemians is of paramount importance. Hence the spatial concentration of the Creative Class might crucially depend on the spatial concentration of Bohemians because the latter indicates an environment "… that attracts other types of talented or high human capital individuals," (Florida 2002b:55). According to the author, innovative hot spots are characterized by the three big T's, "technology, talent and tolerance". These ingredients are simultaneously required to attract creative people as well as to stimulate economic growth and development. For operationalizing the concept, Florida measures 'technology' using the Milken University index representing the concentration of high technology companies as well as an innovation index which counts patents per capita. For 'talent' he takes information on focus groups from interviews and surveys. Finally, 'tolerance' is measured by the proxy of gays' concentration in a locality. As Florida puts it – the presence of gays' best indicates that the area is highly tolerant – they are simply the best "canaries of a creative economy". They signal where the environment is favorable for development of creativity as well as for entrepreneurship-favorable conditions in a locality in general (Lee et al. 2004). Combining the three components, Florida is able to construct a quantitative measure, the Creativity Index, which he applies to metropolitan areas in the USA. The author claims that variations in the index across regions are highly correlated to measures of economic performance.

1.2 Pros and cons

Most of the debate on Florida's concept (for instance, Malanga 2004; Kotkin 2004, 2005; Daly 2004; Nathan 2005) is based on theoretical reasoning rather than on empirical evidence. Besides this, some authors critically discuss the interpretation and implementation of Florida's concept in local policy debates. Others attempt to substitute the concept of the Creative Class with some 'creative city' effect of globalization (Scott 2006).

In the following we concentrate on the main topical lines of criticism based on empirical evidence. First of all, Florida is criticized for using "suggestive correlations" to corroborate his basic arguments (Markusen and Johnson 2006). According to his opponents, his empirical strategy is based on simple descriptive evidence or regression analyses which do not provide a robust test of the main hypotheses. The logic of testing is criticized for disregarding causality and the logic of the main assumptions itself is accused of circularity. Observation and characteristics of the Internet bubble burst cities are taken as a model in his measure of economic success. Hence it is not surprising that these particular cities rank highest in Florida's estimates of economic performance according to his creativity concepts (Malanga 2004). Another objection in this context regards the claim that "jobs follow people". It is argued that a more standard economic explanation would be rather that a skilled workforce attracts the employers.

Florida is also criticized for providing non-reliable empirical results. If re-ranked according to job growth as a well-established measure for the economic growth of a locality, the leaders in Florida's ranking go among the last – like New York for example

(Malanga 2004; Kotkin 2004, 2005; Nathan 2005). Moreover, the construction of the Creative Class and its value system is seen as deficient. The critics question whether the attraction power of cultural amenities deserves to be highlighted and whether these "weak" locational factors are really important as an incentive for all different types and categories of creative people. These preferences seem to differ between age groups (Clark 2002; Nathan 2005) and type of locality (Gautier et al. 2005; McGranahan and Wojan 2007).

A further strand of the literature questions the transferability of Florida's concept to the European context (Nathan 2005 for the UK and Mattsson 2007 for Sweden). An important aspect is the difference in mobility. Cultural differences and in particular differences in languages are a barrier for mobility between European countries (see, for example, Belot and Ederveen 2005). Moreover, cultural amenities and cultural sites might be much more decentralized in the European context compared to the US because of historical reasons. For instance, Germany was characterized by a large number of minor states before 1871. Both factors would lead to a less obvious concentration of creative workers in the EU.

Finally, the implications of Florida's concept for local economic policies are highly debatable. Even if there is such a relationship between creativity and economic growth, the question arises whether it is a prudent strategy to invest in attractive amenities in order to pool creative people (Turok 2004). Real evidence that such a 'bohemistic' investment will be an efficient instrument for spurring economic growth is lacking. Some of the critics are claiming that there are some cases where following Florida's strategy has led to a lag in development and an increase in the crime rate (Malanga 2004).

Despite these critical arguments, the ideas of the existence of a Creative Class and its importance for economic development have found a lot of adherents also in the academic profession. What makes Florida's concept special is the fact that his classification primarily focuses on professions, not on qualifications or industries (Glaeser 2005, Nathan 2005). Behind this stands the implicit assumption that the analysis of occupational activities might open a superior way of measuring the contribution of human capital to regional economic development.

Florida (2004) has given some detailed answers to the mentioned criticisms. However, it seems that he himself (as most of his critics) fails to recognize the need of "hard" econometric testing of the major assumptions underlying his concept. Several studies have recently tried to fill this gap which will be surveyed in the next subsection.

1.3 Previous studies

The attraction of the Creative Class by a bohemian milieu has been repeatedly the focus of econometric research. Fritsch and Stuetzer (2008) regress the share of the Creative Class on a contemporaneous artist-Bohemian index and other variables describing local amenities and living conditions for the creative milieu. Using German cross-sectional data for 2004, the authors find highly significant positive effects for the artist-Bohemian

index and interpret this as evidence for the view that soft locational factors play a key role in attracting creative people.

In the same vein of research, Boschma and Fritsch (2007) analyze the regional distribution of the Creative Class and its effects for more than 450 European regions in eight different countries. They find a highly uneven geographic distribution which is influenced not only by the level of urbanization but also by factors such as climate of tolerance and openness. Boschma and Fritsch first make a more precise differentiation of the groups of Florida's Creative Class. While Florida determines the Creative Class as composed by creative core and creative professionals, Boschma and Fritsch extract the Bohemians from the creative core and therefore recognize three groups forming the Creative Class: Bohemians, creative core (excluding Bohemians) and creative professionals. Using this differentiated concept Boschma and Fritsch run regressions with various specifications in order to test Florida's thesis that the spatial concentration of Creative Class is influenced by the concentration of Bohemians. In particular, they regress the three endogenous variables – the log of the creative core, creative professionals, Creative Class – on independent variables such as the share of Bohemians, an openness index, a public provision index, a cultural opportunity index (the share of work force active in cultural and recreational activities), long-run employment growth and population density. The latter is thought of as a 'catch-all' variable explaining factors like land prices, regional wage levels etc. In order to check the explanatory power of the specific regressors, the authors omit the share of Bohemians and the cultural opportunity index, respectively, and compare the reduced model to a full specification. Since the goodness of fit markedly drops especially if the share of Bohemians is excluded, Boschma and Fritsch conclude that there is an important effect of this group on the size of the Creative Class in its different modifications. Additionally, the authors find a positive significant effect on employment growth and new business formation. They support the view that the creative occupation indicator is more significant a measure for human capital than formal education.

Wojan et al. (2007) apply a two-step procedure for U.S. data. In a first step, they regress the regional share of the Creative Class on a large set of explanatory variables in a cross section. From this equation they calculate an expected size of the Creative Class for each location. Positive deviations from this expected value –the residual of the regression– are interpreted as an indicator of a favorable cultural milieu and vice versa. In a second step, the authors regress different indicators of local economic performance on a set of explanatory variables including the residual from the first stage regression. Taking into account different forms of spatial autocorrelation they find evidence for the positive impact of a creative milieu on economic development.

Evidence for a significant effect of Bohemians on the concentration of creative workers is provided also by Glaeser (2005). To test the validity of Florida's claims, Glaeser uses data for 242 U.S. areas in the 1990s. Glaeser runs separate regressions of population growth on the share of local workers in the creative core, patents per capita in 1990, the Gay Index and the Bohemian Index additionally to a schooling variable. The share of Bohemians turns out to be the only variable which does eliminate the schooling effect. Hence Glaeser concludes: "The raw correlation between the Bohemian Index and growth is almost about the same as the raw correlation between growth and the number

of college graduates. Maybe there is something to this bohemianism after all." (Glaeser 2005: 596). All in all, Glaeser expresses a differentiated view on Florida's work. On the one hand he sees it as a popularization of the standard concept for local development stressing the high importance to cities of attracting human capital. On the other hand he is at odds with Florida's polarization between Creative Class and human capital. Glaeser argues that there is lack of empirical evidence for this differentiation.

1.4 Methodological weaknesses of previous attempts to test Florida's concept

The reviewed empirical literature has some major deficiencies. Although some of these studies use sophisticated econometric methods, they do not deal adequately with the severe problems of causality and endogeneity in which Florida's concept is trapped. Most of the literature so far has interpreted correlation or a positive estimated coefficient in a multivariate regression as a causal linkage. Although the main claim of Florida that Bohemians attract the Creative Class is plausible at first glance it may well be the other way around. A traditional explanation could simply be that the Creative Class is interested in theatres and cultural environment and expresses a demand for "culture". Hence when a locality with a concentration of creative people starts to develop economically, new market opens for the product of the Bohemians. As a consequence of this, Bohemians are flocked to this locality. A higher concentration of Bohemians in places where the Creative Class is concentrated then might generate a creative milieu. The crucial point for a sound empirical approach is to take this reverse causality adequately into account. Moreover, the question arises which variables can be truly considered as exogenous. For example, McGranahan, Wojan (2007) include population density, human capital and labor market indicators as exogenous variables in their specification. These variables, however, are determined by economic forces which themselves are influenced by the Creative Class according to Florida's theory.

To the best of our knowledge, the empirical attempts to test Florida's main hypothesis have not used panel data methods so far. The advantage of panel data is the possibility to include regional fixed effects. This seems to be important in our context, because unobserved heterogeneity of different locations may play a major role. The fixed-effects method eliminates at least the part of this heterogeneity which is constant over time. Moreover, with dynamic panel methods it is possible to tackle the endogeneity problem. Therefore, we will apply these particular methods in the empirical part of our paper.

2 Data and descriptive evidence

2.1 Data and definition of variables

The data source used in this paper is a two percent random sample from the Employment Statistics of the Institute for Employment Research, Nuremberg (IABREG).[3] It includes all workers, employees and trainees obliged to pay social insurance contributions for the time period 1975 to 2004. Not included in the data are self-employed persons, civil servants, marginally employed persons and students enrolled in higher education. The employment register contains detailed histories for each worker's time in employment. Here we consider all persons who were employed on 30th June of each year. Besides detailed information on professions, the data set contains personal characteristics of workers like gender, age and education as well as some basic information about the employer (industry affiliation, location, firm size).

The qualification of the workers in the sample can be subdivided into three broad categories: (i) low-skilled: persons with no occupational qualification regardless of level of schooling, that is, with or without upper secondary education (Abitur); (ii) skilled: persons with an occupational qualification whether or not they have an upper secondary education (Abitur); (iii) highly skilled: persons with upper secondary education who are holding a degree from a university, polytechnic, or college of higher education.

Because there are still large structural differences between the eastern and the western part of Germany, we restrict the analysis to workers in West Germany. We exclude part-time workers, apprentices, and workers with more than one employment contract. Moreover, we drop all observations with no valid information on earnings, age, skills or the region of the workplace.

Since our aim is to test the validity of Florida's assumptions, we will stick to his original definitions as far as possible. However, following Boschma and Fritsch we extract the Bohemians as a separate entity.[4] According to these authors we define Bohemians as writers and creative or performing artists; photographers and image and sound recording equipment operators, artistic, entertainment, and sports associate professionals; fashion and other models (see Boschma and Fritsch 2007:8). We further recast the grouping of the Creative Class which is divided into Bohemians (BOH), Other Creative Core (OCC) and Creative Professionals (CPR). As an alternative to Florida's concept we also defined three further indicators: the share of high-skilled workers (HS), the share of workers in Mathematics, Engineering, Natural Sciences and Techniques (MENT) and the share of workers with a background in Humanities (HUM).

[3] For a description of the data source see Bender and Haas (2002).

[4] Boschma and Fritsch also stick to Florida's definitions and try to create an internationally comparable definition of Bohemians and the other professions in the Creative Class. Their classification aims to be applicable in European context with minor adjustment of the national data available. To achieve this, they are using the International Standard Classification of Occupations (ISCO 88), tailored by the International Labour Office (ILO), at the 3-digit level to define Florida's Creative Class according to the European definitions of occupations.

These classifications are applied to West German data for the period 1975 to 2004. Information on professional activities in the data set consists of a three-digit index of occupations which roughly differentiates between 300 categories (for a detailed view on the classification see Table A1 in the appendix).

2.2 Descriptive evidence

We first consider the correlations between the regional indicator variables in 1990 and 2004. Perhaps not surprisingly, Table 1 shows a high correlation between the share of high-skilled workers (HS) and the Creative Class excluding Bohemians (OCC). The correlation is especially strong in 1990 (0.92), but declined somewhat in 2004 (0.88). A markedly lower correlation is found between OCC and the share of Bohemians (BOH). The share of workers in MENT professions is highly correlated with OCC and HS. The same is true for Bohemians and the share of workers with a background in Humanities. In general, all correlations appear to be smaller in 2004 as compared to 1990.

– include Table 1 about here –

Figure 1 depicts the development over time of the share of Bohemians (BOH) and the remainder of the Creative Class (OCC) in metropolitan areas (region type 1), urban areas with a core city of intermediate size (region type 2) and rural areas (region type 3). It is shown that both indicators are highest for metropolitan areas and lowest for rural regions. Hence there is some evidence that the share of Bohemians and the other Creative Class is increasing with population density. Moreover, both time series show a clear upward trend in all region types.

– include Figure 1 about here –

We next reproduce one of the "suggestive correlations" which have been interpreted as evidence for Florida's hypotheses. In a cross section for 2004, we ran a regression for the share of the Creative Class excluding Bohemians (OCC) using a constant and the share of bohemians (BOH) as explanatory variables. This gives a coefficient for BOH of 1.6 with a t-statistic of 6.5. Using robust heteroscedasticity standard errors shows that the t-statistics is not significant (1.55). However, excluding an outlier and the few observations where the share of Bohemians is zero yields a coefficient of 4.20 with a heteroscedasticity robust t-statistic of 7.16. At first glimpse one might therefore conclude that there is a strong and statistically highly significant influence of Bohemians on the Creative Class. Figure 2 gives a scatter plot of the relationship between the two variables and the corresponding regression line. This again shows a strong correlation. However, this descriptive evidence cannot be considered a valid test of the hypothesis.

– include Figure 2 about here –

3 Estimation strategy and econometric results

3.1 Estimation strategy

Our two main hypotheses to be tested will be:

> H1: A higher regional concentration of the Creative Class is followed by higher economic performance of the region.
>
> H2: A higher regional concentration of the Bohemians attracts other Creative Class people to those regions.

A possible indicator of economic performance is the growth of the regional Gross Domestic Product (GDP). However, as statistics for local GDP on county level are not available for a long-term analysis, we concentrate on the growth rate of employment and the wage bill. The empirical investigations of the two hypotheses are seriously plagued with endogeneity and reverse causality issues. Does the Creative Class trigger employment growth and a higher wage bill or does a successful economic environment lead to an inflow of creative people into the region? Is it that the Bohemian environment that attracts creative and economically successful people or is it the demand for cultural activities expressed by the (typically high-income) members of the Creative Class? Since both directions of causality are theoretically plausible, correlation or static regression analyses are not adequate for assessing Florida's hypotheses. In contrast to a simple approach, an empirical investigation also has to control for a bulk of other influences on regional economic performance as well as the spatial concentration of creative workers. Moreover, it is likely that the concentration index for both groups at the regional level changes only slowly over time. This sluggishness is typically modeled by an autoregressive specification.

In a first step, we used a panel version of a vector autoregression (VAR) model to check the influence of lagged explanatory variables on the dependent variables. This estimation method is applied to the full data set with an observation period from 1975 to 2004. Note that the number of observations in our sample is large enough to overcome the well-known bias in dynamic panel estimation (Nickell 1981; Bond 2002). In a second step, we collapsed our data to six five-year periods by taking averages over regional variables. To this modified data set we applied different versions of a GMM system estimator which takes account of endogeneity of the relevant variables.

3.2 Empirical findings using a panel VAR

The specification of the VAR model is as follows:

$$\mathbf{y}_{it} = \boldsymbol{\nu}_i + \boldsymbol{\mu}_t + \sum_{k=1}^{m} \mathbf{A}_k \mathbf{y}_{i,t-k} + \boldsymbol{\varepsilon}_{it}\,, \qquad (1)$$

where $\mathbf{y}_{it}$ is a $(k \times 1)$ vector of dependent variables, $\mathbf{v}_i$ is a corresponding vector of fixed effects for region i, $\boldsymbol{\mu}_t$ captures fixed time effects and $\boldsymbol{\varepsilon}_{it}$ is a vector of stochastic disturbances of the same dimension. The influence of the lagged explanatory variables is tested using a Wald-F-test. The maximum lag length is chosen as 10 years. For determining the optimal lag length

The results are shown in Table 2. It turns out that all variables considered here are significantly influenced by their own lagged values. Hence there is a considerable inertia in these indicators.

– include Table 2 about here –

According to the test results, lagged values of the Creative Class excluding Bohemians (OCC) have a statistically highly significant effect on both of our indicators for economic performance: the log of employment (LEMP) and the log of the wage bill (LWBILL). By contrast, lagged values of the share of high skilled have a statistically significant effect neither on the regional employment nor on the regional wage bill with only one exception. This supports the view that the concept of the Creative Class outperforms traditional indicators of human capital in explaining regional economic performance. The results for the reverse Granger causality reveal that a positive regional employment development and – somewhat weaker – also the regional wage bill feed back on the share of the Creative Class. The same is true for the high skilled variable.

The evidence suggests Granger causality for the Creative Class and regional economic performance in both directions, i.e. interdependence: a favorable economic environment attracts creative people and the concentration of creative people fosters further economic development. Note that at least for the results based on the Schwarz criterion we do not find evidence for Granger causality of the share of high skilled on regional economic performance, whereas the reverse is true especially for the effect of lagged employment on the share of high skilled. According to the findings the high skilled in general flock at locations where the number of jobs is increasing.

Table 3 gives first evidence on hypothesis H2. Again we find highly significant influence of lagged endogenous variables indicating the sluggishness of the share of Bohemians and other creative people over time (not reported in the Table 3). The findings, however, are not supportive to the hypothesis derived from Florida's work. According to the test results lagged values of the regional concentration of Bohemians have no statistically significant effect on the spatial concentration of the Creative Class. The same is true for the reverse effect. Hence there is no indication for Granger causality between Bohemians and the Creative Class in the German data. Testing the relationship between Bohemians and the share of high-skilled workers suggests that a spatial concentration the high-skilled in the past affects the actual concentration of Bohemians, whereas no evidence can be found for the reverse.

– include Table 3 about here –

The next step is to extend the specification of the model and to test the effect of the Creative Class and high-skilled workers simultaneously. Moreover, we included two other control variables: the share of female workers (FEM) and the log of average firm size in the region (LFSIZE). Note that the share of female workers also captures an ef-

fect of the industry structure because the share of females is industry specific.[5] According to the Schwarz criterion the optimal lag length for the employment equation is 1 and for the wage bill equation 2 (years). Again the influence of the lagged endogenous is statistically highly significant where the sum of coefficient is slightly above 0.8 (see Table 4). Moreover, the regression corroborates our finding from above that the concept of the Creative Class outperforms the traditional human capital indicator. The long-run effect of the share of the Creative Class (excluding Bohemians) is positive and the Wald test clearly rejects the null. By contrast, the long-run coefficient of the share of the high skilled is even negative and the Wald test does not contradict the exclusion of this variable from the specification. The same is true for the firm-size variable. The share of female workers is negative in the long run. In this case the Wald test is weakly significant for employment growth and significant at the 5 percent level for the wage bill specification.

– include Table 4 about here –

We then checked the influence of variables on the concentration of the Creative Class. It turned out that the share of females and average firm size had no influence on OCC. We therefore omitted these variables and included the share of high-skilled workers and an indicator for wage inequality (INEQ) which measures the log difference between the eighth and second decile of the wage distribution. The consideration of the latter variable is motivated by the fact that the expected income of highly motivated and creative people increases with the inequality of the earnings distribution.[6] The results are shown in Table 5. On the one hand we find that the share of the Creative Class (OCC) is clearly influenced by lagged performance variables (LEMP and LWBILL). On the other hand, there is no effect of lagged values of the share of Bohemians in total employment on the regional concentration of the Creative Class. Table 5 also identifies the concentration of high-skilled .workers and the inequality of earnings as two factors attracting the Creative Class.

These findings are at least partly at odds with Florida's assertion that the Creative Class is less interested in material values and more in the cultural amenities and liberality of a location as indicated by the concentration of Bohemians. According to our results, the Creative Class flocks at locations where economic conditions are favorable with respect to employment and the wage bill. Instead of the concentration of Bohemians, it is the concentration of high-skilled persons in general that seems to play the key role.

– include Table 5 about here –

[5] The share of females in service industries is typically lower than in manufacturing.

[6] This result follows from a search theoretic framework where the value of search increases with inequality especially for those workers with higher abilities or intensity of search. For the influence of inequality on the search process see Aldachev, Möller (2007).

3.3 Empirical findings using a dynamic panel approach

The second estimation approach assumes that the relationship between the key variables become effective over a longer time span. We collapsed our data to six five-year periods by taking averages over regional variables. To this modified data set we applied different versions of a dynamic panel estimator. We started by testing H1 (superiority of the Creative Class concept). In principle, two main variants of dynamic panel approach are available, both based on the generalized method of moments (GMM). These are the classic Arellano-Bond (1991) difference estimator and the Blundell-Bond (1998) system estimator. Whereas the former uses lagged level information as instruments for variables transformed to differences (or orthogonal deviations), the latter does the reverse by employing level variables by past differences. As, for instance, Roodman (2006: 29) points out, "… for random walk–like variables, past changes may indeed be more predictive of current levels than past levels are of current changes …".

Let x_{it} be an endogenous variable. Then the lagged difference $\Delta x_{i,t-1}$ and all higher lags should not correlate with the error term ε_{it}, provided there is no serial correlation in the error process. Note that in case that x_{it} is assumed to be predetermined, the current difference, $\Delta x_{i,t}$, can serve as an instrument as well. In system GMM an assumption on initial conditions has to hold implying that – controlled for other covariates – the deviations of the initial observations, x_{i1}, must not correlate with the regional fixed effects. The technique proposed by Blundell-Bond (1998) exploits these and other moment conditions in a system approach (for a closer description see Bond (2002)).

Note that stationarity is required for the Blundell-Bond approach, i.e. the (sum of) coefficient(s) on the lagged dependent variable must have absolute value less than unity.

For explaining regional economic performance as measured by the log of regional employment we used the log of median wage (earnings), the log of average firm size (LFSIZE) and the share of female workers (FEM) as regional variables.[7] Additionally, we included alternatively the share of the Creative Class workers (OCC) or the share of high-skilled workers (HS). In the specification we used (lagged levels) GMM-type instruments for the log of employment (LEMP), the log of the median daily gross wage (LW) and the human capital variables (OCC or HS).[8] As standard instruments differences of all twofold lagged variables were employed. Moreover, in all specification we included dummy variables for each time period in the sample, and – insofar levels were concerned – dummy variables for the type of the region.[9] Throughout the following estimates we used Windmeijer's (2005) correction of standard errors.

[7] The share of female workers, however, was significant in neither specification and therefore excluded from the model.

[8] This implies the introduction of separate instruments for each period unless collapsed.

[9] We used a classification from the *Bundesamt für Bauwesen und Raumordnung* (BBR) in Bonn, ranging from metropolitan cities (regional type 1) to rural areas in the periphery (type 9).

Besides the GMM estimators we used a simple OLS regression disregarding the panel structure of data and a fixed effects panel (FEP) model. Theoretically the former should produce an upward bias for the coefficient of the lagged endogenous variable, whereas the latter should do the reverse. As recommended by Bond (2002), the (theoretically unbiased) GMM estimates of these coefficients should lie in the range spanned by FEP and OLS estimates.

Using the GMM system estimator for the regional economic performance indicators (employment, wage bill) leads to a sum of coefficients on the lagged endogenous variables which is very close to unity. We therefore decided to go back to the Arellano-Bond (1991) difference estimator for the investigation of H1.[10] The maximal lag length was chosen to three 5-years periods.

The coefficient of the 1-period lagged endogenous variable is estimated between 0.279 (FEP) and 1.352 (OLS), and the sum of coefficients of the lagged endogenous variable between 0.432 (FEP) and 0.991 (OLS). The estimate for the difference GMM approach fits well to the requirements: the coefficient of $LEMP_{i,t-1}$ is 0.873 and the sum of coefficient of all three lagged endogenous is 0.831 (see Table 6).

In Table 6 we present one and two step estimates for three different specifications. In the first we used the Creative Class as a regressor, in the second the share of high-skilled workers and in the final one both. First one can note that the 1 and 2-step estimates of the coefficients are quite similar for a given specification. In all variants we find a high degree of inertia in regional employment and the same sign pattern for all coefficients. For the current log median wage and average firm size there is a positive effect on employment. In both cases this effect is mitigated by the coefficient of the one-period lag of the corresponding variable which bears a negative sign. The share of workers from the Creative Class in the first specification exceeds the value 2 and is higher than the coefficient of the share of high-skilled workers in the second specification. Both are statistically highly significant. However, if included simultaneously in the third specification, only the coefficient of the Creative Class remains (weakly) statistically significant. According to the result, the Creative Class concept seems to outperform a traditional measure of human capital also here.

– include Table 6 about here –

With respect to the test statistics, the validity of the assumptions for the dynamic panel method differs widely across specifications. Whereas all tests do not reject the over-identification and exogeneity restrictions underlying the approach, this is not the case for the second and third specification. Note that the null is rejected especially for both variants of the Hansen test. Also under this aspect, the first specification is clearly preferable.

Table 7 shows the implied long-run effects on regional employment. The results show that a 10 percent higher regional wage would increase employment (through migration and higher participation) by between 0.2 and 0.5 percent. An increase of the share

[10] The fact that regional employment might be close to a random walk implies that the validity of the instruments has to be scrutinized by the corresponding tests.

of the Creative Class by 10 percentage points would increase regional employment by between 0.8 to 1.3 percent. This is higher than the long-run effect initiated by increasing the share of high-skilled workers. Finally, doubling average firm size would lead to 0.1 to 0.5 percent higher employment.

– include Table 7 about here –

For investigating the question "who is attracting the Creative Class?" the dynamic panel method for the data on 5 years periods is used again. Here we employed the Blundell-Bond (1998) system estimator. We find considerable inertia in the regional distribution of the Creative Class (see Table 8). Contrary to Florida's assumptions, our estimates show that employment growth and the growth of the wage bill affect the regional concentration of the Creative Class. Hence creative persons seem to be concerned with regional economic conditions. In specification 1 we additionally included the share of high-skilled persons as an explanatory variable and in specification 2 the share of Bohemians. It turns out that specification 1 clearly outperforms specification 2. Although both variants pass the test statistics with respect to the adequacy of instruments with only one or two exceptions, there is some indication for serial correlation in the latter. Moreover, the share of Bohemians is not significant in the 1-step estimates (where the corresponding standard errors are more reliable compared to the 2-step procedure). By contrast, the effect of the high-skilled on the Creative Class is highly significant in all variants. Again, this result does not corroborate a basic assertion in Florida's work.

– include Table 8 about here –

3.4 Conclusions

Richard Florida's thought-provoking concept of the Creative Class can be seen a fruitful contribution for our understanding of regional economic development because it stresses the importance of professional activities and the potential role of the cultural milieu for attracting knowledge carriers and innovative people to a location. However, previous attempts to corroborate the basic pillars of Florida's theory typically suffer from serious deficiencies. Since correlation does not imply a causal relationship and reverse causality might be an important issue in the context of regional development, modern empirical techniques are required to look deeper at the phenomena.

The present paper aims at scrutinizing two basic hypotheses of Richard Florida's concept of the Creative Class. The first is that the regional concentration of the Creative Class entails better economic performance as measured by employment growth or an increasing wage bill. Moreover, the Creative Class concept should outperform "traditional" indicators of human capital such as the share of high-skilled workers in the regional labor force. Using a large micro data set for West Germany for the observation period 1975 to 2004 containing information on professional activities, we are able to collect annual panel data for 323 NUTS 3 regions. Indeed, our results indicate that Florida's classification scheme for creative people seems to have remarkable explanatory power for regional economic performance. On the basis of two different econometric approa-

ches we find evidence for the Creative Class playing an important role in regional economic development. In addition, the concept of measuring regional innovative capabilities by counting high-skilled persons seems to be less adequate when it comes to identify the growth potential of a region. Our econometric investigation − relying on panel VAR Granger causality tests and on dynamic panel estimation methods − confirms the first part of Florida's story. The empirical findings, however, are at odds with the second part. According to Florida; the Creative Class has a taste for a liberal cultural milieu which is typically indicated by a regional concentration of Bohemians, whereas favorable economic conditions do not play a major role. For German data we cannot support this view. There is no evidence for the Creative Class following the Bohemians. By contrast, we find some support for the hypothesis that creative workers prefer living in economically prosperous regions. Moreover, the concentration of other high-skilled people seems to matter more than the concentration of Bohemians. Therefore, we are skeptical vis-à-vis a simplistic adaption of Florida's concept by local policy makers true to the motto "Let's create a liberal cultural scene; this will attract creative people and the region becomes an economic hot spot". Regional economic development seems to be somewhat more complex.

References

Arellano, M. and S. Bond. (1991): Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Review of Economic Studies 58: 277–97.

Arellano, M. and O. Bover. (1995): Another look at the instrumental variables estimation of error components models. Journal of Econometrics 68: 29–51.

Belot, M. and S. Ederveen (2005): Indicators of Cultural and Institutional Barriers in OECD Countries, CPB Memorandum, The Hague.

Blien, U., J. Südekum and K. Wolf, (2006): Local Employment Growth in West Germany: A Dynamic Panel Approach, Labour Economics, 13 445-458.

Blundell, R. and S. Bond (1998): Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics 87: 11–143.

Bond, S. (2002): Dynamic panel data models: A guide to micro data methods and practice. Working Paper 09/02. Institute for Fiscal Studies. London.

Boschma, R. and M. Fritsch (2007): Creative Class and Regional Growth – Empirical Evidence from Eight European Countries, Jena Economic Research Papers, 2007 – 066.

Clark, T. (2002): Urban Amenities: Lakes, Opera, and Juice Bars. Do They Drive Development, The University of Chicago Working Paper and prepared as a chapter for The City as an Entertainment Machine, Research in Urban Policy 9, New York: JAI Press/Elsevier in progress.

Daly, A. (2004): Richard Florida's High-Class Glasses, Grantmakers in the Arts Reader, Summer 2004.

Damelang, A., M. Steinhardt and S. Stiller (2007): Europe's Diverse Labour Force - The Case of German Cities, EURODIV Paper 49.2007

Dreher, C. (2002): Be Creative - or Die, Salon Publication, Salon.com Archive (06.06.2002) http://dir.salon.com/story/books/int/2002/06/06/florida/index.html?source=search&aim=/books/int.

Florida, R. (2002a): The Rise of the Creative Class: And how it's transforming work, leisure, community, and everyday life, New York: Basic Books.

Florida, R. (2002b): Bohemia and Economic Geography, Journal of Economic Geography, 2, 55 -71.

Florida, R. (2004): Revenge of the Squelchers, The Next American City Journal: 2004, June.

Florida, R. (2005): The Flight of the Creative Class: The new global competition for talent, London: Harper Collins.

Florida, R. and G. Gates (2001): Technology and Tolerance: The Importance of Diversity to High-Technology Growth, The Brookings Institution, Survey Series, 2001, June.

Fritsch, M. and M. Stuetzer (2008): The Geography of Creative People in Germany, forthcoming in: International Journal of Foresight and Innovation Policy.

Gautier, P., M. Svarger and C. Teulings (2005): Marriage and the City. Centre for Economic Policy Research Discussion Paper 4939.

Glaeser, E. (2005): Review of Richard Florida's The Rise of the Creative Class, Regional Science and Urban Economics, 35: 593-596.

Glaeser, E., J. Kolko and A. Saiz (2001): Consumer City, Journal of Economic Geography 2001(1): 27-50.

Holtz-Eakin, D., W. Newey, and H.S. Rosen (1988): Estimating vector autoregressions with panel data. Econometrica 56: 1371–95.

Heilbrun, J. (1992): Art and culture as central place functions. Urban Studies 29(2):205–215.

Heilbrun, J. (1996): Growth, accessibility and the distribution of arts activity in the United States: 980 to 1990. Journal of Cultural Economics 20(4):283–296.

Jacobs J. (1961): Death and Life of Great American Cities. New York: Random House.

Johnson, R., A. Onwuegbuzie and L. Turner (2007): Towards a Definition of Mixed Methods Research, Journal of Mixed Methos Research, SAGE Publications 1(2):112-133.

Kotkin, J. (2004): The Capital of What, The New York Sun, February 19, 2004.

Kotkin, J. (2005): Uncool Cities, Prospect Magazine, Issue 115.

Knudsen, B., R. Florida and K. Stolarick (2005): Beyond Spillovers: The Effects of Creative-Density on Innovation, Rotman School of Management, University of Toronto and The Martin Prosperity Institute.

Knudsen, B., R. Florida, G. Gates and K. Stolarick (2007): Urban Density, Creativity, and Innovation, Working Paper http://creativeclass.com/rfcgdb/articles/Urban_Density_Creativity_and_Innovation.pdf.

Landry, C. (2000): The Creative City: A Toolkit for Urban Innovators London, Earthscan Publications Ltd.

Lee, S., R. Florida and Z. Acs (2004): Creativity and Entrepreneurship: A Regional Analysis of New Firm Formation, Regional Studies, 38(8):879-891.

Malanga, S. (2004): The Curse of the Creative Class, The City Journal: Winter 2004.

Markusen, A. (2006): Urban development and the politics of a Creative Class: evidence from the study of artists. Environment and Planning A 38(10):1921–1940.

Markusen, A. and A. Johnson (2006): Artists' Centers: Evolution and Impact on Careers, Neighborhoods and Economies Minneapolis: Hubert H. Humphrey Institute of Public Affairs: University of Minnesota.

Mattsson, H. (2007): Mobile Talent or Privileged Sites? Making Sense of Biotech Knowledge Worker Mobility and Performance in Sweden, Social Geography, 2007(2):115–123.

McGranahan, D. and T. Wojan (2007): Recasting the Creative Class to Examine Growth Processes in Rural and Urban Counties, Regional Studies 41(2):197–216.

Mellander, C. and R. Florida (2006): The Creative Class or Human Capital? Explaining Regional Development in Sweden, CESIS Electronic Working Paper No 79. http://www.infra.kth.se/cesis/documents/WP79.pdf (2007-10-10).

Möller, J. and A. Aldashev (2007): Wage Inequality, Reservation Wages and Labor Market Participation – Testing the Implications of a Search-Theoretical Model with Regional Data, International Regional Science Review, 30 (2), 120-151.

Nathan, M. (2005): The Wrong Stuff, Creative Class Theory, Diversity and City Performance, Centre for Cities, Discussion Paper no. 1, September.

Nickell, S. (1981): Biases in dynamic models with fixed effects. Econometrica 49(6): 1417–26.

Ottaviano, G. and G. Peri (2004): The Economic Value of Cultural Diversity: Evidence from US Cities, in Wood, P. (ed): The Intercultural City Reader, London: Comedia.

Rausch, S. and C. Negrey (2006): Does the Creative Engine Run? A Consideration of the Effect of Creative Class on Economic Strength and Growth, Journal of Urban Affairs 28(5):473-489.

Roodman, D. (2006): How to Do xtabond2: An Introduction to "Difference" and "System" GMM in Stata, Working Paper Number 103, December 2006

Scott, A. (2006): Creative Cities: Conceptual Issues and Policy Questions, Journal of Urban Affairs, 28(1):1-17.

Turok, I. (2004): The Distinctive City: 'Quality' as a Source of Competitive Advantage, unpublished paper, University of Glasgow.

Windmeijer, F. (2005): A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of Econometrics 126: 25–51.

Wojan, T., D. Lambert and D. McGranahan (2007): Emoting with Their Feet: Bohemian Attraction to Creative Milieu, Journal of Economic Geography, 2007:1-26.

Text figures and tables

Table 1: **Correlations between the shares of different group of workers in the total regional workforce**
(West Germany, 1990 and 2004)

Variables (share of the respective group in total regional workforce)		**1990**					
		BOH	**OCC**	**CPR**	**HS**	**MENT**	**HUM**
Bohemians	BOH	1.000					
Other Creative Core	OCC	0.384	1.000				
Creative Professionals	CPR	0.259	0.560	1.000			
High-Skilled	HS	0.467	0.915	0.551	1.000		
Math., Eng., Nat.Sc.,Techn.	MENT	0.278	0.915	0.566	0.848	1.000	
Humanities	HUM	0.962	0.363	0.229	0.438	0.246	1.000
		2004					
		BOH	**OCC**	**CPR**	**HS**	**MENT**	**HUM**
Bohemians	BOH	1.000					
Other Creative Core	OCC	0.342	1.000				
Creative Professionals	CPR	0.173	0.456	1.000			
High-Skilled	HS	0.430	0.880	0.405	1.000		
Math., Eng., Nat.Sc.,Techn.	MENT	0.216	0.894	0.463	0.756	1.000	
Humanities	HUM	0.969	0.339	0.142	0.421	0.200	1.000

Table 2: **Granger Causality tests for the effect of creative and high-skilled workers on regional economic performance**
(results of VAR panel regressions, West Germany, 1985 - 2004)

lagged	**Criterion for choosing optimal lag length**							
explanatory	**Akaike**				**Schwarz**			
variable	**opt. lag**	**l-r. eff.**	**co-** **F-test**		**opt. lag**	**l-r. eff.**	**co-** **F-test**	
	dep.var.: ln employment (LEMP)							
OCC	2	0.633	4.94	**	2	0.633	4.94	**
HS	6	0.356	1.08		2	-0.260	0.13	
	ldep.var.: ln wage bill (LWBILL)							
OCC	2	1.173	5.39	**	2	1.173	5.39	**
HS	8	1.594	1.69	(*)	2	0.201	0.6	
	dep. var.: share of other creative (OCC)							
LEMP	6	0.014	5.61	**	2	0.011	6.34	**
LWBILL	6	0.011	2.42	*	2	0.008	2.51	(*)
	dep. var.: share of high-skilled (HS)							
LEMP	8	-0.033	1.75	(*)	4	-0.024	3.72	**
LWBILL	8	-0.030	1.4		6	-0.027	1.94	(*)

Notes: results based on fixed-effects panel estimates for 323 counties; **, *, (*) denote significance at the 1, 5 and 10 percent level, respectively; opt.lag: optimal lag; l-r. coeff.: long-run coefficient implied by the estimation; the specification includes fixed effects for counties and time periods; number of observations: 6460.

Table 3**: Granger Causality tests for the effect of Bohemians on creative workers**
(results of VAR panel regressions for 323 West German regions, 1985 - 2004)

lagged explanatory variable	**Criterion for choosing optimal lag length**							
	Akaike				**Schwarz**			
	opt. lag	**l-r coeff.**	**F-test**		**opt. lag**	**l-r coeff.**	**F-test**	
	dep.var.: share of other creative (OCC)							
BOH	10	0.009	1.28		2	0.020	0.52	
	dep.var.: share of Bohemians (BOH)							
OCC	6	0.873	1.46		2	0.370	1.85	
	dep.var.: share of Bohemians (BOH)							
HS	10	0.033	2.64	**	2	0.037	7.11	**
	dep.var.: share of high skilled (HS)							
BOH	9	-0.566	0.9		4	-0.031	0.48	

Notes:see table 2**.**

Table 4: **Long-run effects of alternative variables on the economic performance of regions**
(results of VAR panel regressions for 323 West German regions, 1990 - 2004)

	dependent variable: LEMP (opt lag length:1)				
	coeff.			**long-run effects**	
	lag. end.	**OCC**	**HS**	**FEM**	**LFSIZE**
coeff.	0.814	2.134	-0.832	-0.400	-0.004
F-stat.	1670.410	10.480	1.170	2.960	0.020
p-value	0.000	0.001	0.281	0.086	0.891
	dependent variable: LWBILL (opt lag length:2)				
	sum coeff.			**long-run effects**	
	lag end.	**OCC**	**HS**	**FEM**	**LFSIZE**
coeff.	0.824	2.298	-0.061	-0.300	-0.047
F-stat.	1090.300	7.820	0.180	3.050	1.300
p-value	0.000	0.001	0.838	0.049	0.275

Notes:. lag.end.: lagged endogenous variable; F-stat.: Wald test of exclusion of respective variable; the optimal lag length refers to the Schwarz criterion; the regression takes account of clustering with respect to regions.

Table 5: **Long-run effects of alternative variables on the concentration of the Creative Class**
(results of VAR panel regressions for 323 West German regions, 1990 - 2004)

	dependent variable: OCC (optimal lag length:1)				
	sum coeff.		**long-run effects**		
	lag end.	LEMP	BOH	HS	INEQ
coeff.	0.774	0.016	0.036	0.274	0.023
F-stat.	3025.750	9.560	0.090	40.680	31.230
p-value	0.000	0.002	0.767	0.000	0.000
	dependent variable: OCC (optimal lag length:1)				
	sum coeff.		**long-run effects**		
	lag end.	LWBILL	BOH	HS	INEQ
coeff.	0.773	0.015	0.035	0.264	0.024
F-stat.	2994.400	10.760	0.080	38.640	35.990
p-value	0.000	0.001	0.776	0.000	0.000

Notes: See table 4.

Table 6: **Dynamic Panel Estimates for Regional Log Employment**

(Difference GMM, 5 years periods 1975-2004, 323 West German regions)

	Diff-GMM - 1 step		**Diff-GMM - 2 step**		**Diff-GMM - 1 step**		**Diff-GMM - 2 step**		**Diff-GMM - 1 step**		**Diff-GMM - 2 step**	
Variable	**coeff.**	**t-stat**	**coeff.**	**t-stat**	**coeff.**	**t-stat**	**coeff.**	**t-stat**	**coeff.**	**t-stat**	**coeff.**	**t-stat**
	(1)		(2)		(3)		(4)		(5)		(6)	
ln Empl. L1	0.873	5.79	0.840	6.20	0.776	5.30	0.842	6.66	0.683	5.48	0.714	6.62
ln Empl. L2	-0.263	-3.24	-0.243	-3.14	-0.239	-2.99	-0.231	-3.09	-0.220	-3.21	-0.208	-3.25
ln Empl. L3	0.221	2.63	0.241	3.21	0.290	4.16	0.251	4.02	0.272	4.45	0.246	4.52
ln median wage	1.129	2.43	0.942	2.20	0.986	2.68	0.909	2.69	0.720	2.29	0.645	2.17
ln median wage L1	-0.507	-1.64	-0.335	-1.18	-0.443	-1.64	-0.224	-0.88	-0.200	-0.84	-0.115	-0.54
Other Creative Class	2.318	2.82	2.246	2.90	-	-	-	-	2.251	1.83	2.731	2.54
Share of high skilled	-	-	-	-	1.253	2.66	1.493	3.43	-0.180	-0.19	-0.508	-0.62
ln Firm Size	0.198	4.17	0.163	3.85	0.166	4.30	0.136	4.06	0.151	4.02	0.125	4.54
ln Firm Size L1	-0.120	-4.21	-0.107	-4.21	-0.100	-4.63	-0.105	-5.42	-0.092	-4.12	-0.086	-4.82
Year dummies	yes		yes		yes		yes		yes		yes	
	test-stat.	p.-val.	test-stat.	p.-val.	test-stat.	p.-val.	test-stat.	p.-val.	test-stat.	p.-val.	test-stat.	p.-val.
F-Stat.	35.43	0.000	44.61	0.000	45.01	0.000	58.62	0.000	55.17	0.000	70.20	0.000
Sargan Overid.Test	20.38	0.255	20.38	0.255	36.83	0.004	36.83	0.004	50.98	0.035	50.98	0.001
Hansen Overid.Test	18.98	0.330	18.98	0.330	32.68	0.012	32.68	0.012	44.07	0.172	44.07	0.005
Exogeneity Test (H)	10.50	0.232	10.50	0.232	12.97	0.113	12.97	0.113	24.94	0.105	24.94	0.024
Exogeneity Test (D)	8.48	0.486	8.48	0.486	19.71	0.020	19.71	0.020	19.14	0.400	19.14	0.039
# of instruments	27		27		27		27		34		34	

Notes: All estimates are with 5-years period average data for 1975 to 2004 for *N*=323 West German regions. Calculation were made in Stata 9.1 using xtabond2 (see Roodman 2006);t-statistics were calculated by using Windmeijer's (2006) finite sample correction; Sargan (Hansen) Overid.Test: Sargan (Hansen) test of over-identification restrictions; Exogeneity Test (H, D);Difference-in-Hansen tests of exogeneity of instrument subsets (Hansen, Difference);.F-Stat.: General F-Statistic of the model; Arellano-Bond (AR2): Test statistic for serialcorrelation of order 2 (cannot be calculated here since T=3, only). Data Source: IAB employment statistics

Table 7: **Long-run Effects on Regional Employment**
(Dynamic Panel Estimates, 323 West German Regions 1985-2004)

Variable	**Long-run effect on regional employment (x 100)**					
	Specification 1		**Specification 2**		**Specification 3**	
	1-step	2-step	1-step	2-step	1-step	2-step
ln Wage	3.689	3.767	3.126	4.971	1.963	2.141
Creative Class (OCC)	13.751	13.945	-	-	8.500	11.026
High skilled (HS)	-	-	7.218	10.835	-0.680	-2.053
Firm Size (FS)	0.466	0.342	0.375	0.223	0.221	0.160

Notes: Long-run effects calculated from Table 6.

Table 8: **Alternative Specifications for Explaining the Concentration of the Creative Class**

(Dynamic Panel Estimates, 323 West German Regions, 1985-2004)

	Sys-GMM - 1 step		Sys-GMM - 2 step		Sys-GMM - 1 step		Sys-GMM - 2 step	
Variable	**coeff.**	**t-stat**	**coeff.**	**t-stat**	**coeff.**	**t-stat**	**coeff.**	**t-stat**
	(1)		**(2)**		**(3)**		**(4)**	
				specification 1				
const.	-0.005	-1.41	-0.006	-1.75	-0.007	-1.51	-0.007	-1.79
Creative L1	0.923	39.91	0.913	52.99	0.917	42.07	0.903	55.74
High Skilled	0.466	4.47	0.430	6.20	0.460	4.85	0.491	7.75
High Skilled L1	-0.381	-3.57	-0.331	-4.65	-0.370	-3.82	-0.390	-6.02
ln Empl.	2.615	4.18	2.391	5.61	-	-	-	-
ln Empl.L1	-2.622	-4.17	-2.404	-5.60	-	-	-	-
ln Wage Bill	-	-	-	-	2.891	5.37	2.467	6.45
ln Wage Bill L1	-	-	-	-	-2.898	-5.45	-2.466	-6.51
	test-stat.	p.-val.	test-stat.	p.-val.	test-stat.	p.-val.	test-stat.	p.-val.
F-Stat.	1130.51	0	1951.36	0	1174.91	0	2274.79	0
Arellano-Bond (AR2)	-1.56	0.119	-1.56	0.119	-1.45	0.147	-1.39	0.165
Sargan Overid.Test	100.53	0	100.53	0	118.04	0	118.04	0
Hansen Overid.Test	69.28	0.079	69.28	0.079	80.28	0.111	80.28	0.111
GMM instruments (L)	43.32	0.255	43.32	0.255	47.72	0.403	47.72	0.403
iv instruments (L)	25.96	0.055	25.96	0.055	32.56	0.038	32.56	0.038
GMM instruments (D)	45.12	0.169	45.12	0.169	55.42	0.278	55.42	0.278
iv instruments (D)	24.16	0.115	24.16	0.115	24.16	0.072	24.16	0.072
# of instruments	74		74		87		87	
				specification 2				
const.	-0.014	-3.15	-0.011	-2.94	-0.019	-3.18	-0.012	-2.69
Creative L1	1.061	72.45	1.061	92.83	1.058	73.18	1.062	97.29
Bohemians	-0.220	-1.32	-0.284	-2.41	-0.208	-1.33	-0.249	-2.31
Bohemians L1	0.214	1.26	0.326	2.51	0.206	1.29	0.302	2.52
ln Empl.	3.081	4.67	2.439	5.01	-	-	-	-
ln Empl.L1	-3.015	-4.58	-2.399	-4.97	-	-	-	-
ln Wage Bill	-	-	-	-	3.046	5.07	2.232	5.00
ln Wage Bill L1	-	-	-	-	-2.971	-5.05	-2.186	-4.99
	test-stat.	p.-val.	test-stat.	p.-val.	test-stat.	p.-val.	test-stat.	p.-val.
F-Stat.	1015.41	0	1571.3	0	1002.83	0	1668.28	0
Arellano-Bond (AR2)	-1.98	0.048	-1.93	0.054	-1.88	0.061	-1.81	0.071
Sargan Overid.Test	113.84	0	113.84	0	136.16	0	136.16	0
Hansen Overid.Test	67.43	0.104	67.43	0.104	84.83	0.059	84.83	0.059
GMM instruments (L)	51.5	0.071	51.5	0.071	59.79	0.083	59.79	0.083
iv instruments (L)	15.94	0.458	15.94	0.458	25.05	0.2	25.05	0.2
GMM instruments (D)	45.5	0.159	45.5	0.159	58.15	0.2	58.15	0.2
iv instruments (D)	24.16	0.187	24.16	0.187	24.16	0.045	24.16	0.045
# of instruments	74		74		87		87	

Notes: see Table 6.

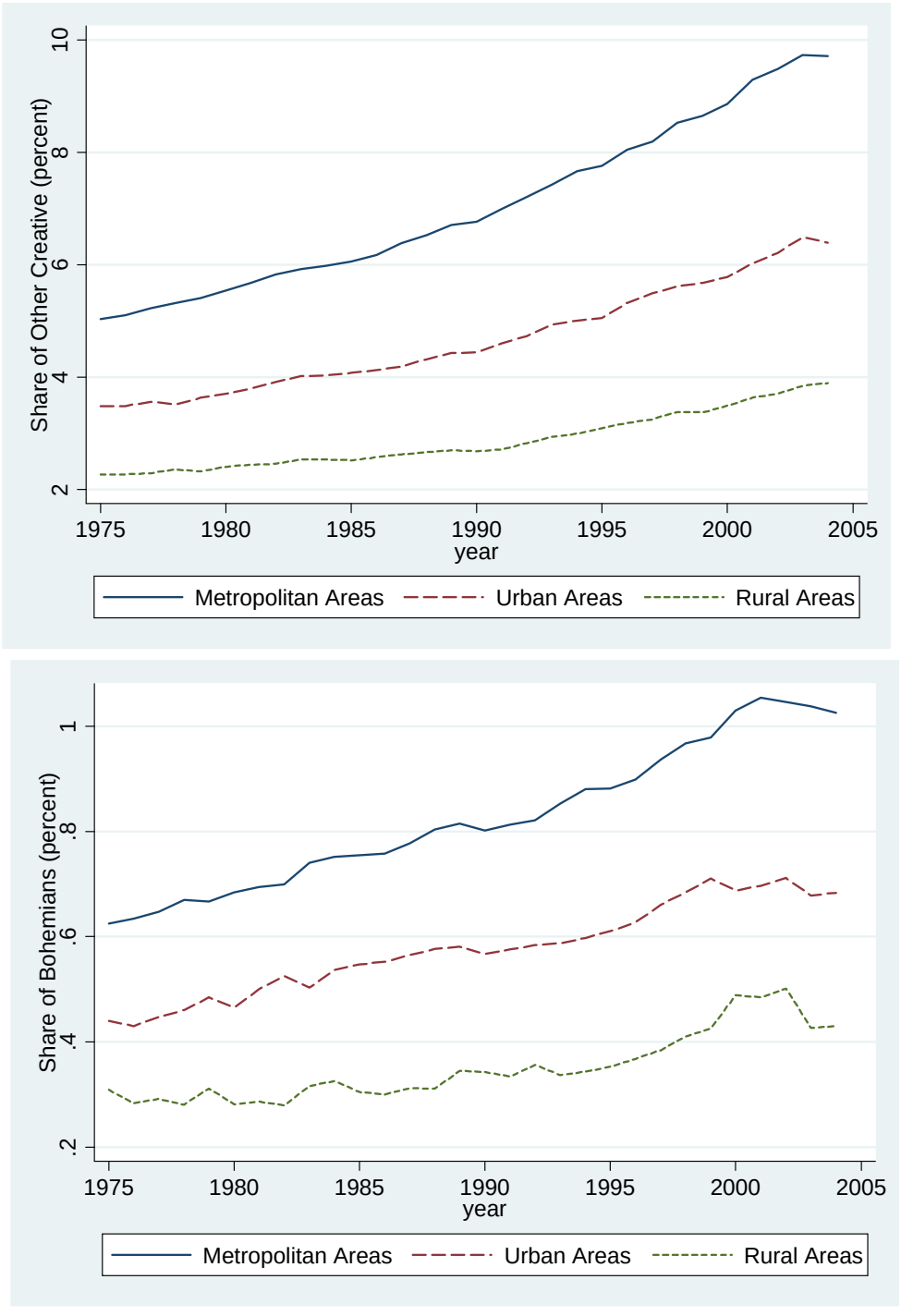

Figure 1: **Development of the Share of Bohemians and Other Creatives by Region Type**
(West Germany , 1975-2004 in percent)

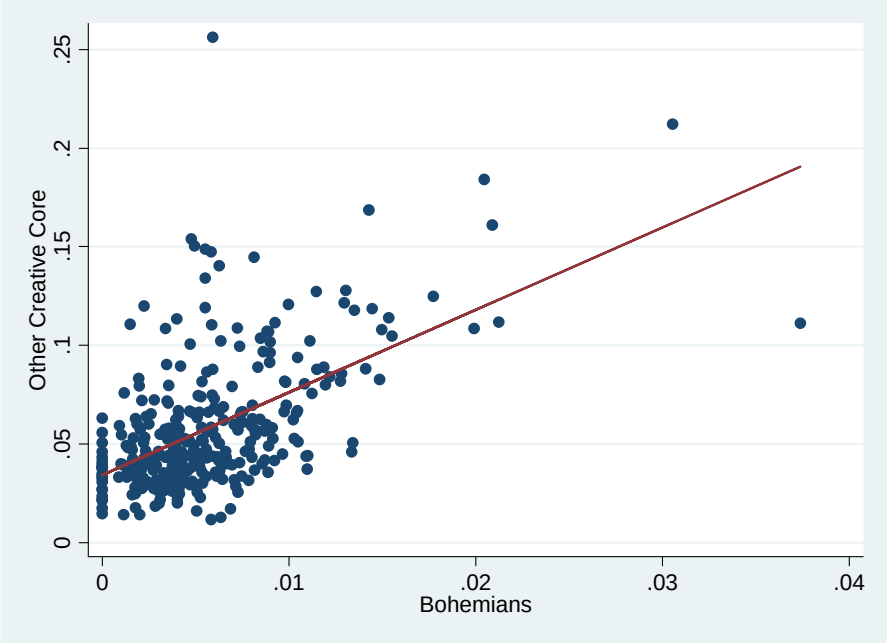

Figure 2: **Correlation between Bohemians and Other Creatives**
(West Germany, 326 counties 2004)

Note: One outlier (Baden-Baden) excluded

Table A1: **The Creative Occupations**

Florida's Definition Components	**IAB Database Code**
	Bohemians
writers and creative or performing artists	821: Publizisten
	823:Bibliothekare, Archivare, Museumsfachleute
	831: Musiker
	832: Darstellende Künstler
	833: Bildende Künstler, Grafiker
photographers and image and sound recording equipment operators; fashion and other models	837: Photographen
	835: Künstlerische und zugeordnete Berufe der Bühnen-, Bild- und Tontechnik
artistic, entertainment, and sports associate professionals	838: Artisten, Berufssportler, künstlerische Hilfsberufe
	Other Creative Core
scientists, think-thank researchers	881: Wirtschafts- und Sozialwissenschaftler, a.n.g., Statistiker
	882: Geisteswissenschaftler, a.n.g.
	883: Naturwissenschaftler, a.n.g.
engineers	601: Ingenieure des Maschinen- und Fahrzeugbaues
	602: Elektroingenieure
	603: Architekten, Bauingenieure
	604: Vermessungsingenieure
	605: Bergbau-, Hütten-, Gießereiingenieure
	606: Übrige Fertigungsingenieure
	607: Sonstige Ingenieure
	611: Chemiker, Chemieingenieure
	612: Physiker, Physikingenieure, Mathematiker
university professors	871: Hochschullehrer, Dozenten an höheren Fachschulen und Akademien
editors	Dispersed in the other categories
Analysts, entrepreneurs, leading administrators	751: Unternehmer, Geschäftsführer, Geschäftsbereichsleiter
	752: Unternehmensberater, Organisatoren
	762: Leitende und administrativ entscheidende
opinion makers	Dispersed in the other categories
software programmers/engineers	774: Datenverarbeitungsfachleute
Gardening Architects	52: Gartenarchitekten, Gartenverwalter
	Creative Professionals
high-tech sectors services, technicians	621: Maschinenbautechniker

	622: Techniker des Elektofaches
	623: Bautechniker
	624: Vermessungstechniker
	625: Bergbau-, Hütten-, Gießereitechniker
	626: Chemietechniker, Physikotechniker
	627: Übrige Fertigungstechniker
	628: Sonstige Techniker
	629: Industriemeister, Werkmeister
	631: Biologisch-technische Sonderfachkräfte
	632: Physikalisch- und mathematisch-technische
	633: Chemielaboranten
	634: Photolaboranten
	635: Technische Zeichner
financial services	691: Bankfachleute
	753: Wirtschaftsprüfer, Steuerberater
legal services	813: Rechtsvertreter, -berater
business services	703: Werbefachleute
	822: Dolmetscher, Übersetzer
Alternative Classifications	**IAB Database Code**
Mathematics, Engineering, Natural Science, Technics	
engineers and technicians	601: Ingenieure des Maschinen- und Fahrzeugbaues
	602: Elektroingenieure
	603: Architekten, Bauingenieure
	604: Vermessungsingenieure
	605: Bergbau-, Hütten-, Gießereiingenieure
	606: Übrige Fertigungsingenieure
	607: Sonstige Ingenieure
	611: Chemiker, Chemieingenieure
mathematicians and natural scientists	612: Physiker, Physikingenieure, Mathematiker
	883: Naturwissenschaftler, a.n.g.
Humanities, Culture	
cultural figures	821 Publizisten
	831: Musiker
	832: Darstellende Künstler
	833: Bildende Künstler, Graphiker
	835: Künstlerische und zugeordnete Berufe der Bühnen
	837: Photographen
humanities	882: Geisteswissenschaftler, a.n.g.