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INVESTMENT IN STADIA AND REGIONAL ECONOMIC DEVELOPMENT– EVIDENCE FROM FIFA WORLD CUP 2006 STADIA

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Investment in Stadia and Regional Economic Development – Evidence from FIFA World Cup 2006

Abstract: Using the case of the new stadiums for the FIFA World Cup 2006 in Germany, this paper is the first multivariate work that examines the potential income and employment effects of new stadiums outside of the USA. This study is also the first work on this topic that conducts tests on the basis of a (serial correlation consistent) Difference-in-Difference model with level and trends. As a robustness check, we use the "ignoring time series information" model in a form that is modified for non-synchronous interventions. We were not able to identify income or employment effects of the construction of new stadiums for the FIFA World Cup 2006, which are significantly different from zero.

Keywords: Sports Economics, Regional Economics, Stadia Infrastructure, Difference-in-Difference Model
JEL classification: H54, L83, R12, R53

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1 Introduction

A series of studies on Metropolitan Statistical Areas (MSAs) in the USA revealed that new sport stadiums do not generate significant income and/or employment effects in their host cities,[1] challenging the "boosters" view of many politicians and sport officials who claim beneficial effects for the local economy (and hence, a justification for public financial support).

Using the case of the new stadiums for the FIFA World Cup 2006 in Germany, this paper is the first multivariate work that examines the potential income and employment effects of new stadiums outside of the USA. Such a study is generally interesting set against the background of the different urban structures in the USA and Europe. In addition, a non-US study is especially interesting because of decade-long US tradition of allocating the stadiums in suburban areas, whereas

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[1] See BAADE (1987, 1994, 1996), BAADE & DYE (1990), BAADE & SANDERSON (1997), COATES & HUMPHREYS (1999, 2000, 2001, 2003).

European stadiums are mostly located near to the city center (FEDDERSEN & MAENNIG, 2008). NELSON (2001) argued that (US-)studies concluding insignificant effects on the home cities of stadiums are misleading, since the data are based on stadia built in the 1960s-1980s. On closer examination of the economic impact, it is evident that stadiums built in Central Business Districts (CBD) or downtown sites have a positive effect, while for suburban stadiums the effects on regional economic development are insignificant or even negative.[2]

This study is also the first work on this topic that conducts tests on the basis of a Difference-in-Difference (DD) model with levels and trends. To address the problem of potential serial correlation in DD models (BERTRAND, DUFLO, & MULLAINATHAN, 2004), we use a serial correlation consistent arbitrary variance-covariance matrix. As robustness check we use the "ignoring time series information" (ITSI) model in a form that is modified for non-synchronous interventions. The paper is organized as followed. Section 2 elaborates on the data, section 3 presents methods and results, and section 4 concludes.

2 Data

The FIFA World Cup 2006 in Germany was held in 12 different stadiums (Berlin, Cologne, Dortmund, Frankfurt, Gelsenkirchen, Hamburg, Hannover, Kaiserslautern, Leipzig, Munich, Nuremberg, Stuttgart). The investment costs for new construction or major renovations totaled an amount of nearly €1.6 billion for twelve stadiums (FIFA, 2006).[3] Additional €1.6 billion was invested into stadia related infrastructure (BÜTTNER, MAENNIG, & MENßEN, 2005). As the aim of this analysis is to identify the effects of the FIFA World Cup stadiums, these twelve cities will be used as the treatment group in the DD model. During the period of observation, several additional stadium construction projects were undertaken in Ger-

[2] MELANIPHY (1996) and SANTEE (1996) also argued that stadiums in inner cities might be more efficient for the regional development of these cities.

[3] Every World Cup stadium was at least renovated. The average expenditure per city was €116.7 million with a minimum investment of €36.0 million (Dortmund) and a maximum investment of €280.0 million (Munich).

many. To avoid biased results, in addition to the FIFA World Cup stadiums, all relevant stadium construction projects (including the FIFA World Cup stadiums) were used as the treatment group in a second DD regression.

Tab. 1 Relevant Stadium Construction Projects in Germany, 1996 to 2005

City	Stadium	Capacity	Team(s)	Costs	Construction	
					Start	End
Berlin	**Olympiastadion**	**74,000**	**Hertha BSC Berlin**	**242.0**	**Aug 2000**	**Aug 2004**
Bremen	Weserstadion	42,100	Werder Bremen	18.0	May 2003	Jul 2004
Cologne	**RheinEnergy-Stadion**	**50,374**	**1. FC Köln**	**117.5**	**Jan 2002**	**Jul 2004**
Cottbus	Stadion der Freundschaft	22,746	FC Energie Cottbus	12.0	Apr 2002	Jul 2003
Dortmund	**Signal Iduna Park**	**83,000**	**Borussia Dortmund**	**36.0**	**May 2002**	**Jul 2003**
Düsseldorf	LTU arena	52,000	Fortuna Düsseldorf	218.0	Sep 2002	Jan 2005
Duisburg	MSV-Arena	31,514	MSV Duisburg	43.0	Oct 2003	Jan 2005
Frankfurt	**Commerzbank-Arena**	**51,500**	**Eintracht Frankfurt**	**126.0**	**Jul 2002**	**May 2005**
Gelsenkirchen	**Veltins-Arena**	**61.524**	**FC Schalke 04**	**192.0**	**Nov 1998**	**Jul 2001**
Hamburg	**HSH-Nordbank-Arena**	**57,000**	**Hamburger SV**	**97.0**	**Jun 1998**	**Aug 2000**
Hannover	**AWD-Arena**	**49,000**	**Hannover 96**	**63.0**	**Feb 2003**	**Jan 2005**
Kaiserslautern	**Fritz-Walter-Stadion**	**48,500**	**1, FC Kaiserslautern**	**48.3**	**Aug 2004**	**Apr 2006**
Leipzig	**Zentralstadion**	**44,193**	**Sachsen Leipzig**	**90.6**	**Dec 2000**	**March 2004**
Magdeburg	Stadion Magdeburg	27,000	1, FC Magdeburg	30.9	March 2005	Dec 2006
Mönchengladbach	Borussia-Park	54,057	Borussia M'gladbach	87.0	Jan 2002	Jul 2004
Munich	**Allianz Arena**	**69,901**	**FC Bayern München**	**280.0**	**Feb 2002**	**May 2005**
Nuremberg	**easyCredit-Stadion**	**46,780**	**1, FC Nürnberg**	**56.0**	**Nov 2003**	**Jul 2005**
Rostock	DKB-Arena	30000	FC Hansa Rostock	55.0	May 2000	Aug 2001
Stuttgart	**Gottlieb-Daimler-Stadion**	**55,896**	**VfB Stuttgart**	**51.6**	**Jan 2004**	**Jan 2006**
Wolfsburg	Volkswagen Arena	29,161	VfL Wolfsburg	51.0	May 2001	Nov 2002

Source: SKRENTNY (2001); FIFA (2006); STADIONWELT (2007); FIFA World Cup 2006 stadia are marked in bold letters.

The analytical framework for this study comprises data of the 118 most populated large urban districts (*"Kreisfreie Städte"*) in Germany in 1995, as reported by the ARBEITSKREIS VOLKSWIRTSCHAFTLICHE GESAMTRECHNUNG DER LÄNDER (2007b).[4] As variables for the regional economic development, the income of private households per capita (ARBEITSKREIS VOLKSWIRTSCHAFTLICHE GESAM-

[4] See Table A1 in the annex for a complete list of the large urban districts.

TRECHNUNGEN DER LÄNDER, 2007b) as well as the number of people employed (ARBEITSKREIS VOLKSWIRTSCHAFTLICHE GESAMTRECHNUNGEN DER LÄNDER, 2007a) in these 118 large urban districts are considered.

Fig. 1. Large Urban Districts in Germany and Stadia Construction Projects

Notes: World Cup venues are marked in black, German large urban districts are marked in grey. Own illustration.

For the income of private households, the period of observation is 1995 to 2005, i.e. a time Span of 11 years; the period from 1996 to 2005, i.e. a time Span of ten years, is considered for employment data. As the data availability starts in 1995, no structural breaks due to German reunification have to be considered.[5]

Several additional indicators of the regional economic development could be considered. HOTCHKISS, MOORE, & ZOBAY (2003), for instance, suggested that the DD equation could be estimated for population. As one easily can see, a sport venue or sport franchise (sport club) might increase the attractiveness of a city from

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[5] Start and end of the observation periods are determined by data availability from EUROSTAT and VGRDL.

a resident's point of view. As a consequence, migration into the city may occur. Thus, initially, it might be appropriate to test for a population effect. However, since it is difficult to assume that unemployed persons will migrate due to the increased attractiveness of a city, we can assume that most migrants will be working in their new city. Thus a strong correlation between population and employment exists and an additional DD analysis on population is unnecessary.

3 Method and Results

3.1 DD Model with Level and Trend

The aim of this paper is to examine if stadium construction projects in Germany – especially those of the FIFA World Cup 2006 – have a significant impact on the economic development of the regions in which they are located. For this purpose, we use a DD estimation. This is a common approach for identifying the effect of a specific intervention or treatment. Therefore, one has to compare the differences in outcome before and after an intervention for groups affected by the intervention to the difference for unaffected groups (BERTRAND, DUFLO, & MULLAINATHAN, 2004, p. 249).

We focus our interest on differences in levels and trends for two variables: employment and income. Since the stadium construction work did not start at the same point in time for all cities (see Table 1) the pre-period and the post-period are not the same for all cities of the treatment group, and they are not even defined for the control cities. Thus, in contrast to many DD models,[6] no dummy variable for the post-period of all cities will be included. Equation (1) and (2) contain the modified DD model:

$$Z_{it} = \alpha + \beta_1 PT_{it} + \beta_2 trend + \beta_3 TT_{it} + \beta_4 PTT_{it} + \varepsilon_{it} \quad (1)$$

$$\text{with } \varepsilon_{it} = \mu_i + \nu_{it}$$

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[6] See e.g. HAGN & MAENNIG (2008a, 2008b), JASMAND & MAENNIG (2008) or HOTCHKISS, MOORE, & ZOBAY (2003) for the use of a general post period dummy.

where Z_{it} is the income of private households in city *i* in year *t* or the employment in city *i* in year *t,* respectively. α denotes the intercept term. *trend* is a trend variable for all 118 large urban districts starting with the value of one in year 1995 (1996) and ends with a value of eleven (ten) in year 2005. No dummy variable for the treatment group is included because our model is a fixed effects model with separate dummies for all large urban districts capturing the treatment group effects. PT_{it} is a dummy for the post intervention phase of the treatment group. It takes the value of one for cities with relevant stadia construction projects from the year of the start of the construction work[7] and zero otherwise. PTT_{it} denotes a variable that covers a post period trend for the treatment cities. It is the product of the variables PT_{it} and *trend*. In the years before the start of the construction project it takes the value of zero and afterwards it displays the corresponding value of the *trend* variable. β_1, β_2, β_3, and β_4 are coefficients to be estimated. μ_i covers the unobserved individual specific effects (fixed effects) while ν_{it} denotes the remainder disturbance.

The coefficients of interests are β_1 and β_4 since they are measuring the level and trend effect of the intervention (stadium construction project) of the treatment cities. If a stadium construction project produces an impact on employment and income, then these coefficients need to be significant. Due to need for workers to accomplish the construction, the demand for employees will increase. Thus, a positive sign of the level effect (PT_{it}) could be found in the employment model.

In contrast, the trend effect on income per capita is theoretically ambiguous. If we assume that the attractiveness of a city increase in the eyes of residents and non-residents (for example, because of an eye-catching new stadium and its asso-

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7 As the employment and income data are on a yearly basis and as the construction work does not always starts at the beginning of year, no effect could be found for a year in which a construction project starts at the year's end. To deal with this problem, stadium constructions will be considered only for a specific year if the start of work lies in first three quarters of this year. If the construction work started in the last quarter of a year, the following year will be treated as starting point.

ciated feel-good effects[8]), then migration into the city may occur. If the population increases, the labor supply might increase, potentially leading to decreasing wages ("compensating differentials", CARLINO & COULSON, 2004).

To isolate the effect of the pure construction phase, a second variant of model (1) will be estimated:

$$Z_{it} = \alpha + \beta_1 PT_{it} + \beta_2 C + \beta_3 trend + \beta_4 TT_{it} + \beta_5 PTTC_{it} + \varepsilon_{it} \quad (2)$$

$$\text{with } \varepsilon_{it} = \mu_i + \nu_{it}$$

The variables *trend*, TT_{it} and PT_{it} are identical to those in model (1). To isolate the effects of the construction phase, the dummy variable *C* takes the value of one during the construction work and the value of zero otherwise.[9] $PTTC_{it}$ is a post intervention trend for the treatment group that starts after the construction work has finished since we expect that changes in the growth trend will occur not due to the construction but, rather, due to advancements in the attractiveness of the city that are derived only from the completed stadium. It has to be admitted, though, that, due to data limitations, for some stadia projects (e.g. Kaiserslautern or Stuttgart) only a few observations are available for *PTTC*, making it statistically demanding to isolate any post-construction effects for these cities.

As shown by BERTRAND, DUFLO, & MULLAINATHAN (2004), DD models are frequently subject to serial correlation, which might lead to an overestimation of the significance of the "intervention" dummy. To check for such problems, we performed an LM test for serial correlation in a fixed effects model as suggested by BALTAGI (2001, pp. 94-95).[10] This test is performed on the residuals of standard

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8 See MAENNIG (2006) for on overview of the effects of iconic architecture of sporting venues and MAENNIG & PORSCHE (2008) for a first contribution dealing with the feel-good effects of large sporting events.

9 The periods of construction can be found in columns 6 and 7 of Table 1. As construction work is not always started at the beginning of a year, the dummy takes the value of one if the works starts before October or does not end before April of the respective year.

10 The LM test statistic is $LM_5 = \sqrt{NT^2/(T-1)(\tilde{v}'\tilde{v}_{-1}/\tilde{v}'\tilde{v})}$, which is asymptotically distributed as $N(0,1)$.

fixed effects regressions of the above described models (1) and (2) for income and employment.[11]

Tab. 2 Test for Serial Correlation

Endogenous variable	Model (1)		Model (2)	
	Treatment WC	Treatment ALL	Treatment WC	Treatment ALL
Income	23.411	23.413	23.249	23.251
Employment	33.964	23.186	23.367	23.371

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.10$.

The LM statistic indeed rejects the null hypothesis of no serial correlation in each case.

For such a case, BERTRAND, DUFLO, & MULLAINATHAN (2004) suggest using an arbitrary variance-covariance matrix, which is consistent in the presence of any correlation pattern within cross section over time. Table 3 and Table 4 show the regression results of the DD coefficients and the corresponding *t*-statistics computed using an arbitrary variance-covariance matrix.

[11] The "intervention" coefficients of these regressions are often significant. But in the line with BERTRAND, DUFLO, & MULLAINATHAN (2004) the estimates might be inefficient.

Tab. 3 DD Model with Fixed Effects for Income of Private Households

	Model (1)		Model (2)	
	Treatment WC_12	Treatment ALL_20	Treatment WC_12	Treatment ALL_20
Constant	9.551*** (3,539.662)	9.550 (3,663.220)	9.551*** (3,502.198)	9.551*** (3,594.649)
P	$-6.109e^{-4}$ (-0.432)	$6.297e^{-4}$ (0.733)	-0.017 (-1.257)	-0.020* (-1.787)
C	–	–	-0.005 (-0.694)	-0.008* (-1.742)
trend	0.019*** (38.905)	0.019*** (37.428)	0.019*** (38.897)	0.019*** (37.413)
TT	-0.005 (-0.465)	-0.008 (-0.820)	$-8.063e^{-4}$ (-0.528)	$2.243e^{-4}$ (0.213)
PTT	$8.260e^{-4}$ (0.201)	$-7.980e^{-5}$ (-0.018)	–	–
PTTC	–	–	0.010 (1.365)	0.009 (1.228)
R^2	0.881	0.881	0.882	0.882
adj. R^2	0.881	0.881	0.881	0.881
F-Stat	441.250***	550.130***	352.928***	374.450***
N	118	118	118	118
T	11	11	11	11
N*T	1298	1298	1298	1298

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.10$. *t*-statistics are in parentheses. Standard errors are computed using an arbitrary variance-covariance matrix as suggested by BERTRAND, DUFLO, & MULLAINATHAN (2004, pp. 270-272).

Tab. 4 DD Model with Fixed Effects for Employment

	Model (1)		Model (2)	
	Treatment WC_12	Treatment ALL_20	Treatment WC_12	Treatment ALL_20
Constant	11.244 *** (1,804.627)	11.245 *** (1,954.357)	11.245 *** (1,950.524)	11.244 *** (1,868.912)
P	0.006 (0.723)	0.015 (1.106)	0.015 (0.623)	0.002 (0.100)
C	–	–	-0.009 (-1.159)	-0.010 (-1.371)
trend	$2.189e^{-4}$ (0.222)	$3.647e^{-4}$ (0.375)	$9.702e^{-4}$ (0.003)	$2.189e^{-4}$ (0.222)
TT	0.006 (1.494)	0.005 (1.224)	0.004 (1.089)	0.005 (1.413)
PTT	-0.008 (-1.523)	-0.006 (-1.146)	–	–
PTTC	–	–	-0.001 (-0.071)	-0.007 (-0.525)
R^2	0.979	0.979	0.979	0.979
Adj.R^2	0.979	0.979	0.978	0.978
F-Stat	10,256.240 ***	10,330.930 ***	9,620.552 ***	9,596.174 ***
N	118	118	118	118
T	10	10	10	10
N*T	1180	1180	1180	1180

Notes: ***p<0.01, **p<0.05, *p<0.10. *t*-statistics are in parentheses. Standard errors are computed using an arbitrary variance-covariance matrix as suggested by BERTRAND, DUFLO, & MULLAINATHAN (2004, pp. 270-272).

In all four estimated income models, the trend variable *trend* is significant at the 1%-level, while it is not significant for the employment estimations. Not surprisingly, this means that there is a positive trend in income for all regarded 118 German large urban districts within the observation period. The treatment trend dummy is insignificant in all models, implying that there is no systematic difference between the treatment and control groups in the growth pattern of urban districts. The coefficients of the post-period dummy *PT* of the treatment urban districts and the respective coefficient of the post-trend dummy *PTT* – the objects of interest – are insignificant for all estimations. The results are not affected by accounting for a special construction effect, as shown in model (2) of the income and employment regressions. Thus, the hypothesis of no income and employment effect of the stadia construction projects in the 12 respectively 20 urban districts with completed stadia construction cannot be rejected.

3.2 Ignoring Time Series Information DD Model

To check robustness, we will use the "ignoring time series information" (ITSI) model in its modification for non synchronous interventions (BERTRAND, DUFLO, & MULLAINATHAN, 2004, pp. 267-269). In a first step, Z_{it} (equation 1 and 2) was regressed on city fixed effects, time fixed effects and relevant covariates.[12] In the second step, the residuals of only the treatment group will be taken into account. These residuals will be divided into two groups: (1) residuals from years before the start of a stadia construction project, and (2) residuals from years after the start of a stadia construction project. The stadia effect can then be analyzed by an OLS regression of a two-period regression of the residuals from the treatment cities only. Consistent *t*-statistics can be obtained from this OLS regression.[13]

Tab. 5 ITSI DD Model for Income of Private Households

	Model (1)		Model (2)	
	Treatment WC	Treatment ALL	Treatment WC	Treatment ALL
Constant	0.046 (1.081)	0.020 (0.596)	0.047 (1.111)	0.022 (0.635)
POST	-0.006 (-0.102)	-0.001 (-0.030)	-0.005 (-0.084)	-0.001 (-0.020)
R^2	0.045	0.019	0.030	0.024
adj. R^2	0.001	0.007	0.014	0.002

Notes: $^{***}p<0.01$, $^{**}p<0.05$, $^{*}p<0.10$. *t*-statistics are in parentheses. Coefficients are from a two-step process using OLS.

12 As done in the previous section, two different variants have been analyzed: (1) no covariates are considered; (2) only a construction dummy is considered.

13 As the numbers of cities is not small, the *t*-statistics don't have to be adjusted (BERTRAND, DUFLO, & MULLAINATHAN, 2004).

Tab. 6 ITSI DD Model for Employment

	Model (1)		Model (2)	
	Treatment WC	Treatment ALL	Treatment WC	Treatment ALL
Constant	1.573 *** (6.016)	1.192 *** (5.734)	1.577 *** (6.050)	1.196 *** (5.760)
POST	-0.008 (-0.022)	-0.004 (-0.013)	-0.014 (-0.039)	-0.003 (-0.010)
R^2	0.095	0.057	0.035	0.016
adj. R^2	0.054	0.032	0.009	0.010

Notes: ***p<0.01, **p<0.05, *p<0.10. *t*-statistics are in parentheses. Coefficients are from a two-step process using OLS.

The results of the ITSI models as shown in Table 5 and Table 6 confirm the findings of the DD model estimated in section 3.1. No coefficient in the ITSI models is significant on any conventional level. The results of the robustness check support the results from the DD model using an arbitrary variance-covariance matrix.

4 Conclusion

We were not able to identify income or employment effects of the construction of the new stadiums for the World Cup 2006, which are significantly different from zero, in the urban districts with completed new stadiums in the period leading up to and after the FIFA World Cup 2006.

We nevertheless hesitate to share the concern expressed both implicitly and explicitly in many of the comparable sports economic studies that the positive effects of new stadiums claimed by many sports protagonists are not true for three reasons. Firstly, other effects such as the feel-good benefit for the population and/or image effects that are difficult to quantify, may be sufficiently important to justify major new stadiums and/or subsidies for them via public funds. With image effects and feel-good effects, economic empiricism in regards to sports is still in its infancy.[14]

Secondly, the treatment group in the selected form of municipality areas might be still too large and too highly aggregated to statistically prove significant effects. Studies on the effects of major sports venues on property values in surrounding areas indicate a maximum affect area of around 3,000 metres (AHLFELDT & MAENNIG, 2007a, 2007b; TU, 2005).

[14] For the measurement of the benefit of the Olympic Games in London 2012 cf. ATKINSON *et al.* (2008); for the measurement of the willingness to pay for the Soccer World Cup 2006 (before and after the event) cf. HEYNE, MAENNIG, & SÜßMUTH (2007).

Appendix

Tab. A1. Population of the 118 largest urban districts (*"kreisfreie Städte"*) in Germany in 1995

No.	City	Popultion in 1995
1	Berlin	3,471,003
2	Hamburg	1,707,251
3	München	1,240,465
4	Köln	964,597
5	Frankfurt am Main	651,097
6	Essen	616,340
7	Dortmund	599,966
8	Stuttgart	586,954
9	Düsseldorf	572,171
10	Bremen	549,157
11	Duisburg	535,473
12	Leipzig	524,870
13	Hannover	523,574
14	Dresden	496,863
15	Nürnberg	493,940
16	Bochum	400,608
17	Wuppertal	382,600
18	Saarbrücken Stadtverband	358,365
19	Bielefeld	324,115
20	Mannheim Universitätsstadt	313,880
21	Gelsenkirchen	292,061
22	Bonn	291,863
23	Chemnitz	291,331
24	Halle (Saale)	287,052
25	Karlsruhe	276,544
26	Wiesbaden	266,532
27	Mönchengladbach	266,095
28	Münster	264,696
29	Magdeburg	262,557
30	Augsburg	260,952
31	Braunschweig	253,513
32	Krefeld	249,821
33	Aachen	247,460
34	Kiel	246,595
35	Rostock	230,768
36	Oberhausen	224,896
37	Lübeck Hansestadt	216,933
38	Hagen	212,909
39	Erfurt	212,532
40	Kassel	201,628
41	Freiburg im Breisgau	198,394
42	Mainz	184,329
43	Hamm	183,734
44	Herne	179,973
45	Mülheim an der Ruhr	176,602
46	Osnabrück	168,106
47	Ludwigshafen am Rhein	167,872
48	Solingen	165,794
49	Leverkusen	162,051
50	Oldenburg (Oldenburg)	150,540
51	Potsdam	144,941
52	Darmstadt	138,973
53	Heidelberg	138,612
54	Bremerhaven	130,720
55	Cottbus	127,791
56	Würzburg	127,627
57	Wolfsburg	126,782
58	Regensburg	125,809
59	Gera	124,971
60	Remscheid	122,710

61	Heilbronn	121,745
62	Bottrop	120,008
63	Pforzheim	118,460
64	Salzgitter	117,776
65	Schwerin	116,876
66	Offenbach am Main	116,460
67	Ulm Universitätsstadt	115,379
68	Zwickau	112,646
69	Ingolstadt	111,626
70	Koblenz	109,292
71	Fürth	108,011
72	Kaiserslautern	101,970
73	Jena	101,724
74	Erlangen	101,372
75	Trier	99,379
76	Dessau	92,030
77	Wilhelmshaven	90,944
78	Brandenburg an der Havel	87,713
79	Flensburg	87,642
80	Neumünster	82,030
81	Neubrandenburg	81,786
82	Frankfurt (Oder)	81,633
83	Worms	79,737
84	Delmenhorst	78,079
85	Plauen	73,318
86	Bayreuth	72,692
87	Bamberg	69,901
88	Görlitz	68,773
89	Stralsund	66,944
90	Aschaffenburg	66,339
91	Weimar	62,257
92	Greifswald	61,688
93	Kempten (Allgäu)	61,494
94	Hoyerswerda	61,441
95	Landshut	59,257
96	Rosenheim	58,704
97	Schweinfurt	55,598
98	Suhl	53,986
99	Neustadt an der Weinstraße	53,828
100	Baden-Baden	52,677
101	Hof	52,628
102	Emden	51,653
103	Passau	51,035
104	Wismar	50,870
105	Speyer	49,575
106	Pirmasens	48,562
107	Frankenthal (Pfalz)	47,946
108	Eisenach	45,642
109	Amberg	44,177
110	Straubing	44,022
111	Coburg	43,948
112	Weiden i.d.OPf.	43,171
113	Kaufbeuren	42,694
114	Memmingen	40,492
115	Ansbach	39,638
116	Landau in der Pfalz	39,632
117	Schwabach	37,564
118	Zweibrücken	36,039

Source: ARBEITSKREIS VOLKSWIRTSCHAFTLICHE GESAMTRECHNUNG DER LÄNDER (2007b).

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