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Labour Market Effects of the 2006 Soccer World Cup in Germany

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This study analyses for the first time on the basis of a multivariate analysis ex post the effects on the jobs market of a soccer World Cup, in this case the 2006 World Cup held in Germany. In addition to three methods already used for other analyses in studies of sporting events, an extended "Difference-in-Difference" estimate is used in order to compare the development of the numbers of unemployed in the 12 World Cup venues with the development of the numbers of unemployed in 62 other German cities. The results demonstrate that in none of the respective match venues did the effect of the sporting event on unemployment differ significantly from zero.

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1 Introduction

Before the 2006 World Cup in Germany a series of analyses was published, according to which the investments of around €6 billion in connection with the World Cup competition and the expenditure of the expected 1–2 million foreign visitors would markedly affect income and employment. The estimates fluctuated between a €2 billion and a €10 billion increase in income growth, or up to 10,000 additional jobs (Ahlert 2000, Capital 2006, Deutsche Industrie und Handelskammer 2006, Deutsche Postbank AG 2005a and b, 2006; Kurscheidt 2004). Even in retrospect the soccer World Cup competition was universally felt to be an outstanding and positive event for Germany. However, these perceptions derive from only a few observations *ex post*, that are moreover exclusively descriptive in nature (cf., in particular, Bundesministerium des Innern 2006, Brenke and Wagner 2007).

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Multivariate studies are clearly more restrained in their assessment of the effects of major sporting events and also specifically of the soccer World Cup. Baade and Matheson (2004) investigated in a multiple analysis *ex post* the effect on the income of people in the match venues of the soccer World Cup of 1994 in the USA. They concluded that income developed in an equally weak fashion in 9 of the 13 regions of the contest. Overall, the soccer World Cup had a negative effect on the income of the match venue of more than US$9 billion. Szymanski (2002) collected data on the twenty largest economies in terms of current GDP over the past thirty years, many of which have hosted the Olympic Games or the soccer World Cup at least once during that period. Using a simple regression model, he came to the conclusion that the growth of these countries was significantly lower in soccer World Cup years.[1] The results of these two studies of soccer World Cups are in agreement with other econometric studies of various large sporting events or sports venues. The majority of these studies suggest that the sporting events or sports stadia have little or no significant effect on regional wages, income and/or employment (e.g. Baade, 1987; Baade and Dye, 1990; Baade, 1994; Baade and Sanderson, 1997; Baade and Matheson, 2000, 2001, 2003; Carlino and Coulson 2004[2]). A number of works, particularly those of Coates and Humphreys (1999, 2000a and b, 2002, 2003a and b) or Teigland (1999), have even arrived at significant negative effects. To our knowledge, only very few studies have found significant positive effects of sports facilities and sports events *ex post*. Baim (1994) found positive employment effects for Major League baseball and football for 15 cities in the USA. Hotchkiss *et al.* (2003) found significant positive effects on employment in regions of Georgia (USA) affiliated or close to activities of the Atlanta Olympic Games in 1996, but they did not find significant effects on wages.

The present work supplements previous publications in a number of respects. It is the first work that examines the effects of World Cup 2006 in Germany on an *ex post* basis. It is the first multivariate study to examine the employment effects of a major sporting

[1] No significant effects at all are registered for the Olympic Games.

[2] Although Carlino and Coulson (2004) reach the conclusion that having a NFL team allows the cities to "enjoy" rents that are 8 percent higher.

event outside the USA. This is particularly interesting set against the background of the contrasting modes of functioning of the labour markets in the USA and Europe. In addition, it also tests for method sensitivity by running the dataset in parallel with the three methods usually applied in the studies of Baade and Matheson, Coates and Humphreys and Hotchkiss *et al.* (2003) as well as with a fourth method that attempts to overcome some potential shortcomings associated with the three other methods. Section 2 elaborates on the methods, data and results. Section 3 concludes.

2 Methods, Data and Results

We use data regarding the 75 largest urban districts (kreisfreie Städte) in Germany including the 12 match venues of the 2006 soccer World Cup. The selection of the 75 largest urban districts was made according to the criterion of the population in 1999, for which the data were obtained from the comprehensive economic records of the regions (Arbeitskreis Volkswirtschaftliche Gesamtrechnung der Länder 2005). Match venues of the 2006 soccer World Cup in Germany were the twelve cities Berlin, Dortmund, Frankfurt on the Main, Gelsenkirchen, Hamburg, Hanover, Kaiserslautern, Cologne, Leipzig, Munich, Nuremberg and Stuttgart, whose location in Germany is shown in Figure 1. Berlin, Hamburg, Munich, Hanover, Cologne and Frankfurt on the Main are among Germany's largest cities. In contrast, Kaiserslautern is ranked at only No. 74 in the table of the most populous urban districts.

The period of observation in our study comprised 111 months from January 1998 to March 2007.[3] Hence, the period of observation had already begun more than two years before Germany was selected on 6 July 2000 as the venue for the World Cup and it ends with the latest period for which data are available.

Dependent variables are the monthly numbers of the unemployed for the urban districts obtained from the Federal Labour Agency (Bundesagentur für Arbeit 2006, 2007a). The

[3] For the period before January 1998, data for the numbers of unemployed at the district level were published only quarterly.

development in unemployment in the group of the 12 match venues and the group of the 63 non-venues is compared in Figure 2; the development in unemployment in the match venues and non-venues at first progressed generally in parallel (Figure 2). From about January 2001, unemployment in the match venues rose more strongly that in the non-venues. At the beginning of 2005 the two groups of comparative data again approached each other; however, in July 2005 the jobless figures in the non-venues again fell in comparison with the match venues. In the World Cup year 2006 and the beginning of 2007, the development of unemployment in the match venues and non-venues ran largely parallel, with unemployment in the non-venues falling somewhat more steeply than in the match venues from July 2006.

In order to clarify the extent to which the differences in the development of unemployment figures in the two comparative groups - after controlling for the customary explanatory variables of joblessness - is significantly correlated with the occurrence of the World Cup, we first use the three methods commonly employed in studies in the USA in investigating the economic effects of major sporting events: those of Baade and Matheson (2000, 2001, 2003, 2004), Coates and Humphreys (1999, 2000a and b, 2002, 2003a and b), and Hotchkiss *et al.* (2003).

Hence, according to the method of Baade and Matheson (2000, 2001, 2003, 2004) the following equation is derived:

$$\partial Unemp_{i,t} = \beta_0 + \beta_1 \sum_{i=1}^{n} \partial Unemp_{i,t} \Big/ n_t + \beta_2 \partial Unemp_{i,t-1} + \beta_3 \partial Unemp_{i,t-2} + \beta_4 \partial Unemp_{i,t-3} +$$

(1) $$\beta_5 \ln Pop1999_i + \beta_6 East_i + \beta_7 Trend + \beta_8 Feb + \beta_9 Mar + \beta_{10} Apr + \beta_{11} May + \beta_{12} Jun +$$
$$\beta_{13} Jul + \beta_{14} Aug + \beta_{15} Sep + \beta_{16} Oct + \beta_{17} Nov + \beta_{18} Dec + \beta_{19} WC2006_{i,t} + \varepsilon$$

where

$\partial Unemp_{i,t}$ is the percentage change in the unemployment in city i at time *t*,

$\sum_{i=1}^{n} \partial Unemp_{i,t} \Big/ n_t$ is the average percentage change in unemployment in the sample at time *t*,

$\partial Unemp_{i,t-1}$ is the percentage change in unemployment in city i at time *t*–1,

$\partial Unemp_{i,t-2}$ is the percentage change in unemployment in city i at time t–2,

$\partial Unemp_{i,t-3}$ is the percentage change in unemployment in city i at time t–3,

$\ln Pop1999_i$ is the log population in city i in the year 1999,

$East_i$ is the dummy for urban districts in the region of the former East Germany,

Trend is the time trend,

Feb is the dummy for the month of February,

Mar is the dummy for the month of March,

Apr is the dummy for the month of April,

May is the dummy for the month of May,

Jun is the dummy for the month of June,

Jul is the dummy for the month of July,

Aug is the dummy for the month of August,

Sep is the dummy for the month of September,

Oct is the dummy for the month of October,

Nov is the dummy for the month of November,

Dec is the dummy for the month of December,

$WC2006_{i,t}$ is the dummy for the World Cup 2006 in the months of June and July 2006 in match venues, and

ε is the disturbance variable.

The number of inhabitants of the urban districts in 1999 – the year before Germany was selected to host the World Cup competition – were taken from the comprehensive economic records of the regions (Arbeitskreis Volkswirtschaftliche Gesamtrechnung der Länder 2005).

Table 1 shows in column (1) the results of this evaluation. The variable $WC2006_{i,t}$, which measures effects on unemployment in the match venue, does not differ significantly from zero.

In accordance with Coates and Humphreys (1999, 2000a and b, 2002, 2003a and b), the effects of the 2006 soccer World Cup were evaluated in a second step in a "Fixed Effects" model.

(2) $\ln Unemp_{i,t} = \beta x_{i,t} + \gamma WC2006_{i,t} + \mu_{i,t}$ whereby, $\mu_{i,t} = e_{i,t} + v_i$

where

$\ln Unemp_{i,t}$ is the log unemployment in city i at time *t*,

$x_{i,t}$ is the variable vector with log population in city i in the year 1999, city-specific time trends and time-specific dummy variables, and

$\mu_{i,t}$ is the disturbance variable.

Column (2) in Table 1 presents the results of this model. The estimated values of the city-specific time trends and of the time-specific dummy variables are not reported here, although they were in most cases significant.[4] In this model too, the variable $WC2006_{i,t}$ proves to be not significantly different from zero.

The third step uses the model for the 1996 summer Olympic Games in Atlanta from Hotchkiss *et al.* (2003); they used a standard "Difference-in-Difference" estimate in order to be able to detect changes in a) the intercept, i.e. in the levels of the employment and wages, and b) the slope, i.e. in the growth of the two variables. The "Difference-in-

[4] The results of the evaluation are available from the authors on request.

Difference" estimate compares the variable of interest before and after the incidence of a given event in a region with the change in the same variable in another region that was not affected by that event.[5] For this it is assumed that the development in the affected region would have matched the development in the unaffected region if the event had not occurred. The clear difference between the model of Hotchkiss *et al.* (2003) and the models of Baade and Matheson and of Coates and Humphreys is that these last two test solely the effects during the course of the actual event, whereas with the model of Hotchkiss *et al.* (2003) the medium-term effects can also be determined.

For the effects of the 2006 soccer World Cup on the levels of the unemployed in the match venues, the Hotchkiss *et al.* (2003) model takes the form

$$\begin{aligned}\ln Unemp_{i,t} = {} & \beta_0 + \beta_1 \ln Pop1999_i + \beta_2 LF1999_i + \beta_3 \Pr od1999_i + \beta_4 HV1999_i + \\ & \beta_5 DL1999_i + \beta_6 Feb + \beta_7 Mar + \beta_8 Apr + \beta_9 May + \beta_{10} Jun + \beta_{11} Jul + \beta_{12} Aug + \\ & \beta_{13} Sep + \beta_{14} Oct + \beta_{15} Nov + \beta_{16} Dec + \beta_{17} WC_i + \beta_{18} Post_t + \beta_{19} PostWC_{i,t} + \varepsilon\end{aligned} \tag{3}$$

where

$LF1999_i$ is the share of gross value added of the agriculture, forestry and fisheries sector in city i in the year 1999,

$\Pr od1999_i$ is the share of gross value added of the manufactoring industry sector in city i in the year 1999,

$HV1999_i$ is the share of gross value added of the trade, hospitality industry and traffic sector in city i in the year 1999,

$DL1999_i$ is the share of gross value added of the public and private service industry sector in city i in the year 1999,

[5] Frequently, this concerns a political event, such as the introduction of a new law. The classic use of the "Difference-in-Difference" estimate originated with Card and Krueger (1994), who used it to investigate the consequences of minimum wages in two States of the USA.

WC_i is the dummy for match venues of the World Cup 2006 (1 for match venue, 0 if not a match venue),

$Post_t$ is the dummy for period after the World Cup 2006 (1 for period after, 0 for period before the World Cup), and

$PostWC_{i,t}$ is the dummy for match venues and period after the World Cup 2006, (1 if match venue and period after the World Cup, otherwise 0),

The shares contributed to the gross value added by the various economic sectors in 1999 were obtained from the comprehensive economic records of the regions (Arbeitskreis Volkswirtschaftliche Gesamtrechnung der Länder 2005).[6]

The period from June 2006 is selected as the post-event period (*Post* =1), corresponding to the beginning of the World Cup on 9 June 2006. Column (3) in Table 1 represents the results estimated from Equation (3) for this follow-up period. The relevant variable, $PostWC_{i,t}$, is not significant. Therefore the levels of the unemployed in the 12 match venues in the period after the World Cup have not developed signficantly differently from those in the other cities in the survey.

To test for an effect on the growth of the numbers of unemployed through the soccer World Cup, the following equation is used, following the procedure of Hotchkiss *et al.* (2003):

[6] The shares contributed to the gross value production in the year 1999 – the year preceding the selection of Germany to host the World Cup – were used, since data in the period are not available for the whole period under consideration but only on a yearly basis.

The excluded industry category is the finance, leasing and venture service.

$$(4)\quad \begin{aligned}\ln Unemp_{i,t} &= \beta_0 + \beta_1 \ln Pop1999_i + \beta_2 LF1999_i + \beta_3 \Pr od1999_i + \beta_4 HV1999_i + \\ &\beta_5 DL1999_i + \beta_6 Trend + \beta_7 Feb + \beta_8 Mar + \beta_9 Apr + \beta_{10} May + \beta_{11} Jun + \beta_{12} Jul + \\ &\beta_{13} Aug + \beta_{14} Sep + \beta_{15} Oct + \beta_{16} Nov + \beta_{17} Dec + \beta_{18} TrWC_i + \beta_{19} TrPost_t + \\ &\beta_{20} TrPostWC_{i,t} + \varepsilon\end{aligned}$$

where

$TrWC_i$ is the trend variable for match venues of the World Cup 2006 (1 if match venue and 1st phase of the period under consideration, 2 if match venue and 2nd phase of the period, etc., otherwise 0),

$TrPost_t$ is the trend variable for period after the World Cup 2006 (1 if 1st phase after the World Cup, 2 if 2nd phase, etc. otherwise 0), and

$TrPostWC_{i,t}$ is the trend variable for match venues and period after the World Cup 2006 (1 if match venue and 1st phase after the World Cup, 2 if match venue and 2nd phase after the World Cup, etc., otherwise 0),

Column (4) in Table 1 shows that the relevant variable $TrPostWC_{i,t}$ here, too, does not differ significantly from zero. For the period after the World Cup, the match venues show in comparison with the non-venues no trend significantly different from zero in the development of unemployment.

Finally, we extend the standard "Difference-in-Difference" estimates of Hotchkiss *et al.* (2003), in that in our model we simultaneously take into account changes as much in the levels as also in the trends of the dependent variable. In this way we avoid distorted results, for example if an unemployment level in a city lower than before the World Cup is exclusively attributable to an already existing negative trend.[7]

[7] Galster et al. (2004) use a similar extended "Difference-in-Difference" estimate in order to investigate the effects on housing prices of accommodation for the disabled.

Since, as shown by Bertrand *et al.* (2004), "Difference-in-Difference" models are frequently subject to serial correlations and also tend to overestimate the significance of the results, in the following we also use White coefficient covariance estimators, which are robust with regard to serial correlation. Bertrand *et al.* (2004) recommend this procedure particularly for "Difference-in-Difference" models with a sample in which $N > 50$.

Our model takes the form

$$\begin{aligned}\ln Unemp_{i,t} &= \beta_0 + \beta_1 \ln Pop1999_i + \beta_2 LF1999_i + \beta_3 \Pr od1999_i + \beta_4 HV1999_i + \\ &\beta_5 DL1999_i + \beta_6 East_i + \beta_7 Trend + \beta_8 Feb + \beta_9 Mar + \beta_{10} Apr + \beta_{11} May + \beta_{12} Jun + \\ &\beta_{13} Jul + \beta_{14} Aug + \beta_{15} Sep + \beta_{16} Oct + \beta_{17} Nov + \beta_{18} Dec + \beta_{19} WC_i + \beta_{20} Post_t + \\ &\beta_{21} PostWC_{i,t} + \beta_{22} TrWC_i + \beta_{23} TrPost_t + \beta_{24} TrPostWC_{i,t} + \varepsilon\end{aligned} \quad (5)$$

Table 1 shows in column (5) the results from Equation (5) for the follow-up period June 2006 to March 2007. The values of the independent variables used have the expected sign and turn out to be almost without exception significant. The value of the variable *Post*, differing significantly and positively from zero, indicates that in the whole sample in the period after the World Cup there is a significantly higher level of unemployment than in the period before the competition. The significantly negative value of the variable *TrPost* shows for the whole sample a significant negative trend in the numbers of the unemployed in the period after the World Cup, in comparison with the period before the competition. Relevant for possible employment effects of the World Cup in the match venues are the two variables *PostWC* und *TrPostWC*. These two variables have proved not to differ significantly from zero. Hence, neither the levels nor the trends of the unemployment figures in the period after the soccer World Cup relative to the period before the competition have developed significantly differently in the match venues from those of the unemployment figures in the non-venues. Therefore, an effect of the World Cup on employment in the 12 match venues can not be demonstrated.

3 Conclusion, and economic and political implications

Our study has demonstrated that the 2006 World Cup could not influence unemployment in the 12 match venues to an extent that was significantly different from its pattern in the non-venues. The result supports Baade und Matheson (2004), who for the 1994 soccer World Cup in the USA overall could not detect positive effects on income in the match venues. Furthermore, the result of our study accords with most of the multivariate analyses *ex post* of incomes and employment for other major sports events and venues, which have without exception related to the USA.

Even if the effects on the jobs market turn out to be small, other economic values need detailed consideration, before these results can lead to the inference that, from an economic perspective, major sports events are inefficient overall. Especially effects such as the feelgood effect benefit for the population and/ or image effects – although difficult to quantify –may be sufficiently important to justify major sporting events and/or the provision of subsidies for them from public funds. In both of the above-mentioned fields of possible effects, the application of economic empiricism to sporting events is still in its infancy.[8]

[8] For the measurement of the experiential benefit of the Olympic Games in London 2012 cf. Atkinson et al. (2006), and Heyne et al. (2007) for the soccer World Cup.

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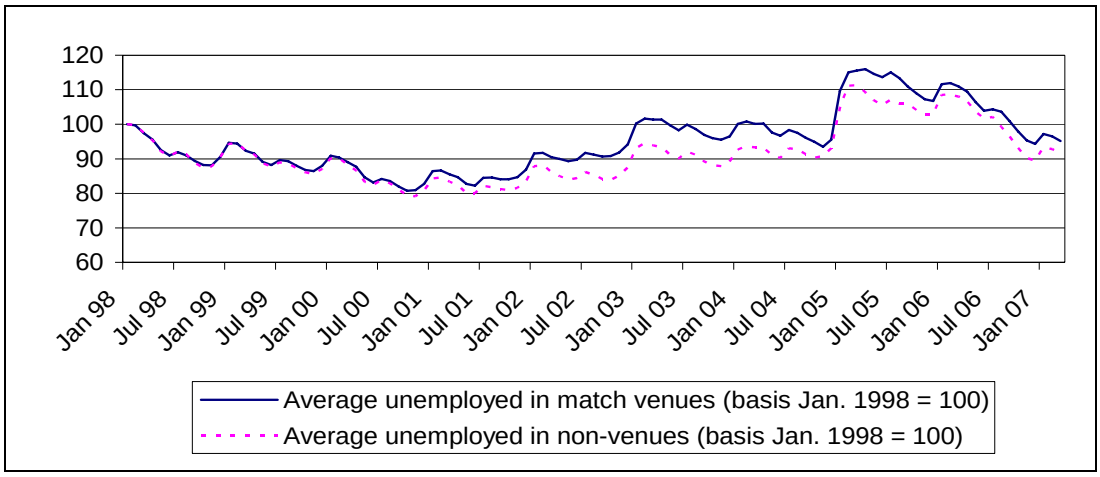
Figure 1: 12 Match venues for the 2006 soccer World Cup

Figure 2: Comparison of the jobless figures in the match venues and non-venues, monthly averages; (1998 = 100)



Data source: Federal labour agency (Bundesagentur für Arbeit 2006, 2007a).

Table 1: Results of equations (1-5)

Equation	(1)	(2)	(3)	(4)	(5)
Dependent Variable	$\partial Unemp_{i,t}$	$\ln Unemp_{i,t}$	$\ln Unemp_{i,t}$	$\ln Unemp_{i,t}$	$\ln Unemp_{i,t}$
	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)	Coefficient (Std. Error)
C	-0.545333	-2.893523**	-5.725571**	-5.785100**	-5.559757**
	(0.449554)	(0.069527)	(0.106001)	(0.102529)	(0.706835)
$\sum_{i=1}^{n} \partial Unemp_{i,t} / n_t$	0.984198**				
	(0.020724)				
$\partial Unemp_{i,t-1}$	0.070232**				
	(0.010390)				
$\partial Unemp_{i,t-2}$	-0.066135**				
	(0.010199)				
$\partial Unemp_{i,t-3}$	-0.029246**				
	(0.010009)				
$\ln Pop1999_i$	0.036357	1.009341**	1.114090**	1.112397**	1.118913**
	(0.034036)	(0.005372)	(0.006182)	(0.005764)	(0.042448)
$LF1999_i$			9.210087**	9.521020**	17.69763
			(1.506866)	(1.479889)	(12.26226)
$\Pr od1999_i$			1.351303**	1.345903**	1.165561**
			(0.057822)	(0.056771)	(0.357648)
$HV1999_i$			2.176097**	2.165001**	2.521375**
			(0.102999)	(0.101086)	(0.632940)
$DL1999_i$			2.742939**	2.736931**	1.065683
			(0.074783)	(0.073364)	(0.561188)
$East_i$	-0.089776				0.569676**
	(0.067240)				(0.059449)
$Trend$	0.000264			0.001809**	0.001669**
	(0.000807)			(0.000108)	(0.000214)
Feb	-0.176624		0.007463	0.006757	0.007886**
	(0.170904)		(0.014261)	(0.014006)	(0.001043)
Mar	0.441219*		-0.008047	-0.009458	-0.007200**
	(0.205819)		(0.014261)	(0.014009)	(0.001570)
Apr	0.418734*		-0.013181	-0.022480	-0.023212**
	(0.204307)		(0.014694)	(0.014460)	(0.002336)
May	0.078646		-0.040491**	-0.051673**	-0.052298**
	(0.208307)		(0.014694)	(0.014463)	(0.003050)
Jun	0.145512		-0.057621**	-0.063543**	-0.071123**
	(0.179536)		(0.014654)	(0.014448)	(0.003482)
Jul	-0.004826		-0.039454**	-0.046037**	-0.052448**
	(0.142460)		(0.014654)	(0.014435)	(0.003519)
Aug	-0.194233		-0.045217**	-0.052542**	-0.057560**
	(0.175659)		(0.014626)	(0.014396)	(0.003105)
Sep	0.187912		-0.064754**	-0.072090**	-0.076431**

	(0.199025)		(0.014655)	(0.014413)	(0.002945)
Oct	0.230864		-0.078732**	-0.086641**	-0.089739**
	(0.189206)		(0.014655)	(0.014407)	(0.003223)
Nov	0.035421		-0.080780**	-0.089263**	-0.091117**
	(0.167445)		(0.014655)	(0.014403)	(0.003083)
Dec	-0.011711		-0.062284**	-0.071341**	-0.071952**
	(0.141289)		(0.014655)	(0.014402)	(0.002208)
$WC2006_{i,t}$	**-0.523758**	**0.027841**			
	(0.454969)	**(0.039916)**			
WC_i			0.018728		-0.029539
			(0.011107)		(0.088953)
$Post_t$			0.051208**		0.077428**
			(0.011678)		(0.013079)
$PostWC_{i,t}$			**0.031908**		**0.001967**
			(0.028774)		**(0.029605)**
$TrWC_i$				0.000459**	0.000663
				(0.000168)	(0.000480)
$TrPost_t$				-0.011736**	-0.021646**
				(0.002042)	(0.001229)
$TrPostWC_{i,t}$				**0.000277**	**-0.001254**
				(0.004875)	**(0.002139)**
Adjusted R-squared	0.579986	0.952688	0.884910	0.888998	0.934962

* bzw. ** = significant on 5%- or. 1%-confidence level