

IZA DP No. 3385

**Why Does Unemployment Hurt the Employed?  
Evidence from the Life Satisfaction Gap  
between the Public and the Private Sector**

Simon Luechinger  
Stephan Meier  
Alois Stutzer

March 2008

# **Why Does Unemployment Hurt the Employed? Evidence from the Life Satisfaction Gap between the Public and the Private Sector**

**Simon Luechinger**

*University of Zurich*

**Stephan Meier**

*Federal Reserve Bank of Boston  
and IZA*

**Alois Stutzer**

*University of Basel  
and IZA*

Discussion Paper No. 3385  
March 2008

IZA

P.O. Box 7240  
53072 Bonn  
Germany

Phone: +49-228-3894-0

Fax: +49-228-3894-180

E-mail: [iza@iza.org](mailto:iza@iza.org)

Any opinions expressed here are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but the institute itself takes no institutional policy positions.

The Institute for the Study of Labor (IZA) in Bonn is a local and virtual international research center and a place of communication between science, politics and business. IZA is an independent nonprofit organization supported by Deutsche Post World Net. The center is associated with the University of Bonn and offers a stimulating research environment through its international network, workshops and conferences, data service, project support, research visits and doctoral program. IZA engages in (i) original and internationally competitive research in all fields of labor economics, (ii) development of policy concepts, and (iii) dissemination of research results and concepts to the interested public.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

## ABSTRACT

### **Why Does Unemployment Hurt the Employed? Evidence from the Life Satisfaction Gap between the Public and the Private Sector<sup>\*</sup>**

High rates of unemployment entail substantial costs to the working population in terms of reduced subjective well-being. This paper studies the importance of individual economic security, in particular job security, in workers' well-being by exploiting sector-specific institutional differences in the exposure to economic shocks. Public servants have stricter dismissal protection and face a lower risk of their organization's bankruptcy than private sector employees. The empirical results for individual panel data for Germany and repeated cross-sectional data for the United States and the European Union show that the sensitivity of subjective well-being to fluctuations in unemployment rates is much lower in the public sector than in the private. This suggests that increased economic insecurity constitutes an important welfare loss associated with high general unemployment.

JEL Classification: E24, I31, J30, J45, J64

Keywords: unemployment, life satisfaction, job security, public sector

Corresponding author:

Alois Stutzer  
Department of Business and Economics  
University of Basel  
Petersgraben 51  
CH-4003 Basel  
Switzerland  
E-mail: [alois.stutzer@unibas.ch](mailto:alois.stutzer@unibas.ch)

---

<sup>\*</sup> We are grateful to Chris Foote, Borja Larrain and participants of seminars at the Federal Reserve Bank of Boston and the University of Zurich for helpful comments. We would like to thank Charles Sprenger for excellent research assistance. The views expressed herein are solely those of the authors and not those of the Federal Reserve System or the Federal Reserve Bank of Boston.

# 1 Introduction

People care about high rates of unemployment—even when they themselves are not unemployed. This is a common observation that also fits empirical regularities. For example, voters express their dislike of high unemployment rates by reducing their support for political incumbents—even if they have not experienced an unemployment spell themselves.<sup>1</sup> Moreover, people report lower subjective well-being when the unemployment rate is higher, even after controlling for personal unemployment (Rafael Di Tella, Robert MacCulloch, and Andrew Oswald, 2003 and Justin Wolfers, 2003). Together, the findings indicate that high general unemployment reduces individual welfare even for people who are still employed.

This paper aims to shed light on the reasons that explain why general unemployment entails costs on the working population. A high rate of unemployment may affect the population as a whole, for example, as a result of general effects like higher crime rates or higher taxes following increased welfare spending. High general unemployment, however, may also affect people's well-being by reducing their personal economic security, for example, by depressing wages or increasing their risk of unemployment. In order to distinguish between general negative externalities of unemployment and changes in economic risks to individuals, we study workers in two sectors of the economy that differ fundamentally in their exposure to economic shocks—people working in the private sector and those working in the public sector. Public sector employees usually enjoy extended dismissal protection and work in organizations that very rarely go bankrupt.<sup>2</sup> Thus, for institutional reasons these workers face a reduced risk of losing their jobs in comparison with workers in the private sector. The fact that queues for government jobs lengthen during recessions (Alan Krueger, 1988) may indicate that high unemployment rates also mean lower job security, and thus prompt people to seek more secure (that is, governmental) jobs. Consistent with this idea, a survey of a representative sample of young French persons between the ages of 20 and 30 found that more than three-quarters wanted to work in the public sector—during a time when youth unemployment rates were far above the already high general unemployment rate of 10 percent. Furthermore, these respondents explicitly stated that they wanted to do so because of higher job security (*Economist*, 2006).

---

<sup>1</sup> This is a finding from the research on vote and popularity functions (see, for example, Donald R. Kinder and D. Roderick Kiewiet 1981).

<sup>2</sup> Our main analysis is for Germany, where overindebted jurisdictions can expect a bailout. In fact, both the Saarland and Bremen have experienced a bailout in 1993.

We investigate whether public servants suffer less from high unemployment than private sector workers, using data on reported life satisfaction and happiness as proxy measures for individual welfare. This approach has proven useful in many economic applications (see, for example, Rafael Di Tella and Robert MacCulloch, 2006, Bruno S. Frey and Alois Stutzer, 2002a, b for reviews).

Measures of subjective well-being allow researchers to capture an overall evaluation of people's experienced utility, including hard-to-measure aspects such as general concerns about the state of the economy, or anxiety about crime rates or job losses. In this kind of measurement, people report their level of subjective well-being without being focused on those aspects directly under study.

The main empirical analysis uses data from the German Socio-Economic Panel (GSOEP) for West Germany between 1984 and 2004. During this period, West Germany experienced large differences and fluctuations in regional unemployment rates—from around 4 percent to almost 20 percent. These fluctuations in the unemployment rate over a long period of time allow us to identify any sectoral differences in workers' sensitivity to unemployment. Moreover, the panel aspect of the data allows us to control for individual heterogeneity. The general results show that people working in the private sector are affected more strongly by general economic shocks than are those working in the public sector. The life satisfaction of private sector employees decreases substantially when unemployment rates are high. People working in the public sector experience much smaller changes in their well-being in response to fluctuations in unemployment rates. Private sector employees' life satisfaction is reduced by 0.56 points (on a scale between 0 and 10) when regional unemployment rises from the lowest value in the sample (Baden-Wuerttemberg) to the highest value (West Berlin in 2003)—similar to the effect of becoming personally unemployed. In comparison, the negative effect on public sector employees is about a third lower than for private sector employees. For the public servants—a particularly well-protected subgroup of all public sector employees<sup>3</sup>, we find no negative correlation whatsoever between regional unemployment and reported life satisfaction. These findings hold after controlling for differences in the wage structure and working conditions in the two sectors, as well as for demographic characteristics and time-invariant individual heterogeneity. In fact, because the public sector attracts more risk-averse individuals than does the private sector (discussed below), the estimated welfare costs from exposure to economic risks are a lower bound when extrapolated to the working population. Overall, the results suggest that a substantial fraction of the psychic costs brought about by

---

<sup>3</sup> In Germany, there are two types of public sector workers: public servants ("Beamte"), who enjoy the strictest dismissal protection, and other people working in the public sector, who are employed under the regular labor law (Ebbinghaus and Eichhorst 2006).

general unemployment is due to increased economic insecurity. General regional externalities of high unemployment rates, like higher crime, etc., seem to have relatively minor consequences for individual well-being shown by the small drop in well-being for public servants.

The qualitative results also hold when the analysis is performed for the United States, using repeated cross-sectional data from the General Social Survey (GSS), and for member countries of the European Union, using repeated cross-sectional data from the Eurobarometer (EB). In both data sets, the well-being of people in the public sector is less sensitive to fluctuations in unemployment rates than is the life satisfaction of people in the private sector.

Any insight as to whether the well-being of workers in the public sector is affected differently by economic shocks than the well-being of workers in the private sector may also help us to understand politico-economic issues. In many countries, public sector employees constitute a large force in the electorate. As voters and as officials implementing policies they have a large influence on the legal rules governing the private labor markets. Public sector employees may be supportive of labor market reforms if they are hurt by high unemployment rates because they feel empathy with the unemployed and fear negative societal repercussions. However, if public sector employees are much less negatively affected by high unemployment rates, the reverse may be true. With little concern for negative consequences for others or the society at large, they may be afraid that reforms in the private labor market could undermine the legitimacy of their own privileges and protections.

In addition, the study of differentials in individual well-being sheds light on the discussion about whether public servants enjoy any rents. Bureaucratic rents, or utility premiums of government sector workers relative to private sector workers, can be caused by high wages, fringe benefits and job amenities, or the possibility of extracting bribes. In previous work, we found a strong correlation for a cross-section of 42 countries between differentials in life satisfaction of public sector employees versus private sector workers and irregular payments to bureaucrats (Simon Luechinger, Stephan Meier, and Alois Stutzer, 2008). The results of this study indicate that the high economic security enjoyed by public sector employees is a valuable fringe benefit of public sector employment that should be taken into account in analyses of labor market rents and of compensation differentials between the public and the private sector.

The paper proceeds as follows: Section 2 discusses potential reasons for the costs of unemployment for the employed. In Section 3, the idea of a life satisfaction gap between employees in the public and the private sectors is explained. Section 4 presents the empirical analysis for Germany, the United States, and 13 European countries. Section 5 offers concluding remarks.

## 2 Unemployment and People's Well-Being

### 2.1 Unemployment Reduces Subjective Well-Being

Unemployment first of all reduces the individual well-being of those personally affected. In their innovative work for Britain, Clark and Oswald (1994, p. 655) summarize their results as follows: "Joblessness depresses well-being more than any other single characteristic including important negative ones such as divorce and separation." For Germany, based on individual panel data, Winkelmann and Winkelmann (1998) find a negative effect of personal unemployment on life satisfaction that would require a sevenfold increase in income to compensate. Importantly, in these two analyses, indirect effects (like income losses) that may, but need not, accompany personal unemployment are kept constant. Being unemployed therefore has psychic costs over and above the potential decrease in the material living standard.<sup>4</sup>

High unemployment rates also have non-negligible effects on people who are not personally affected by unemployment. Based on survey data from population samples from European Union member countries between 1975 and 1992, Di Tella, MacCulloch, and Oswald (2003) show that aggregate unemployment decreases average reported life satisfaction even if personal unemployment is kept constant. The cumulative costs of unemployment are substantial. According to their estimation, the average individual in the working population would have to be compensated with approximately \$200 to offset the loss in life satisfaction caused by a typical U.S.-size recession (that is, a recession that entails a 1.5 percentage point increase in the unemployment rate).<sup>5</sup>

Figure 1 depicts the effect of high general unemployment on the life satisfaction of people in the workforce living in West Germany, based on data from the GSOEP. These are the same data that we will introduce in our main analysis. For the period between 1984 and 2004, average, unweighted, regional unemployment rates (right axis) and average life satisfaction (left axis) are plotted for people who were employed full- or part-time and who were between the ages of 18 and 65. The rate of unemployment fluctuates between a low of 6 percent in 1991 and a high of 11 percent in 1997. Life satisfaction, measured on an 11-point scale from 0

---

<sup>4</sup> For references and a discussion of psychological and social factors determining the drop in life satisfaction of people who become unemployed, see Frey and Stutzer (2002a: 95–109). The specific effect of social work norms on unemployed people's subjective well-being is studied empirically in Clark (2003) and Stutzer and Lalive (2004).

<sup>5</sup> Interestingly, there are systematic differences in the experienced reduction in life satisfaction. Di Tella and MacCulloch (2005) find that the sensitivity to unemployment differs according to individuals' political orientation. Left-wing voters care more about unemployment (relative to inflation) than do right-wing voters.

(“completely dissatisfied”) to 10 (“completely satisfied”), moves countercyclically over almost the whole period. When unemployment rates decrease, workers report higher life satisfaction and vice versa. The raw correlation between the regional rate of unemployment and average regional life satisfaction is  $-0.45$  ( $p < 0.05$ ). This negative correlation between the unemployment rate and people’s reported life satisfaction is evident despite the extended employment protection in German labor law. The question that naturally arises is why even people who are employed feel so much less satisfied with their lives when unemployment rates increase.

## **2.2 Costs of High Unemployment for the Employed**

The potential reasons that explain why workers’ well-being decreases when unemployment rates increase can be divided into two broad categories: First, a high rate of unemployment may have general negative effects on society that affect everybody in a region. Such reasons include not only the direct effects of unemployment on crime and public finances, but also the general increase in income inequality within a society—an increase that may have the effect of triggering workers’ empathy with the unemployed. Second, high unemployment rates affect factors specific to people’s individual workplaces. These reasons include changes in working hours and salaries and most likely a change in the actual and perceived probability of job loss.

### *2.2.1 General effects of unemployment on society*

Unemployment leads to social problems that affect people in general. For example, higher unemployment has been observed to increase crime (see, for example, Anna Oester and Jonas Agell, 2007, Steven Raphael and Rudolf Winter-Ebmer, 2001). In Germany, right-wing crime is positively correlated with regional unemployment rates (Armin Falk and Josef Zweimüller, 2005). If higher crime rates are reflected in lower reported well-being, this can explain the statistical relationship between unemployment rates and subjective well-being. High unemployment also has fiscal effects that may worry the general population. In particular, if unemployment rates are as high as they were in Germany in the second half of the 1990s, the fiscal burden may rise to a level that concerns the working population. These general effects are expected to influence all workers alike independent of their sectoral employment.

People also care about the well-being of others and about inequality within a society. Schwarze and Härpfer (2005) present evidence for Germany that people of all income classes report lower life satisfaction when regional income inequality increases. This may be due to



inequality aversion and/or to empathy for the poor. Similarly, if economic shocks increase unemployment, people may care about the fate of the people who experience unemployment, reducing their own sense of well-being.

### *2.2.2 Effects of unemployment on economic security*

High unemployment rates have effects on individuals' contemporaneous and future economic situations. In times of high unemployment, the pressure on salaries increases, leading to lower average wages (see the literature on the wage curve by, for example, David G. Blanchflower and Andrew Oswald, 1994, David Card, 1995). Because income correlates positively with people's well-being, depressed salaries may explain the lower life satisfaction in times of high unemployment. Moreover, working conditions may become harsher in times of high unemployment. In particular, actual working hours may rise in recessions as firms cut costs and fear of redundancy and scarcity of alternative job opportunities enable firms to force employees to work more hours than they would prefer (see Stewart and Swaffield, 1997, for Britain). This reduces people's leisure time—sometimes without financial compensation. If not taken into account statistically, a negative relationship between the unemployment rate and life satisfaction could thus reflect either depressed salaries or reduced leisure time after economic shocks.

The above-mentioned effects on salaries and working hours refer to realized consequences. However, high unemployment also affects anticipated economic distress, as, for instance, the probability that a worker may himself experience a spell of unemployment in the future increases. A large literature documents the importance of self-reported job security on individuals' well-being (see, for example, Hans De Witte, 1999, Michael Duncan Gallie et al., 1998, Francis Green, 2006). Moreover, people may also expect salary decreases, reduced promotion opportunities, fewer possibilities to change jobs, etc.

In the remainder of the paper, we use the term economic insecurity when addressing the psychic costs of negative anticipatory feelings due both to worries and fear about a job loss or an income reduction in the future and to the many consequences that might follow (like reduced social status, loss of a social network, necessary adjustments in consumption habits, etc.).

### 3 The Life Satisfaction Gap Between Employees in the Public and the Private Sectors

To study the importance of the effects of high unemployment on individuals' economic insecurity (independent of general effects on society), we compare the subjective well-being of workers in the public and private sectors. The public and the private sectors differ sharply in objective job security for two main reasons:

(1) Public sector employees often enjoy special legal protection from dismissals. In Germany, for example, public servants' labor contracts are specified in an extra law. According to this law, public servants enjoy very strict job protection. They can be dismissed only if convicted of an offense that results in (i) at least one year in prison for criminal charges or (ii) six months in prison for homeland security charges (paragraph 48 of the laws for civil servants).<sup>6</sup>

(2) Employment in the public sector is less volatile than in the private sector (for evidence for the U.S., see, for example, Richard B. Freeman, 1987). The lower sensitivity of public sector employment to economic shocks is due not only to different employment contracts, but also to the fact that financial pressure to decrease employment in a recession is lower in the public sector than in the private sector. While private firms can go bankrupt, communes, states, and public companies rarely do. On the contrary, the public sector may keep employment high during a recession as a countermeasure to the economic downturn.

Figure 2 presents evidence in support of the argument that the public and private sectors differ in the objective job security they offer. The figure shows the proportion of people entering unemployment from 1985 to 2004 in West Germany in the two sectors. The reported fractions are calculated from the GSOEP. The series for public sector employees is shown in total, as well as for public servants only. The figure shows that the probability of experiencing a spell of unemployment moves with the unemployment rate for people working in the private sector. For people employed in the public sector, the probability of entering unemployment is much lower and much less sensitive to economic fluctuations. For the subgroup of public servants, the probability is below 1 percent and shows no clear correlation with general trends in unemployment.

Thus, both theoretical arguments and empirical evidence suggest that we can decompose the negative effect of high unemployment on reported subjective well-being into general negative externalities on the one hand and reduced economic security on the other

---

<sup>6</sup> Public employees who are employed under the collective labor agreement of the civil service do not have lifelong tenure. However, after a period of employment of 15 years and after reaching the age of 40, these employees can be dismissed only for important reasons, such as theft, absenteeism or drug abuse at work, or if no longer able to work as a result of long-term sickness (Ebbinghaus and Eichhorst 2006).

hand by comparing the sensitivity of life satisfaction to changes in the unemployment rate across the public and the private sectors. While the life satisfaction of private sector employees is affected by the general externalities and the reduction in economic security, the life satisfaction of public sector employees is affected by the general externalities only; hence, the difference reflects the importance of economic security.

When interpreting how workers' life satisfaction in the private and public sectors is influenced by high unemployment rates, two factors may complicate the issue:

(1) The two sectors may differ in dimensions other than economic or job security. These dimensions may be responsible for the differential effects of economic shocks on workers' well-being. As discussed above, two relevant differences are in wages and working hours. According to the literature on the wage curve, wages in the public sector are usually much less sensitive to the regional unemployment rate than are wages in the private sector (see Blanchflower and Oswald, 1994 for the United States and the United Kingdom, Sanz-de-Galdeano and Turunen, 2006 for the Euro area). If not statistically controlled for, variation in the life satisfaction gap may just reflect differences in the pattern of wages over time. In the empirical analysis, hourly wages and total household income are included to control for this possible factor. A related argument applies to differences in working conditions, which may become relatively harsher in the private sector than in the public sector during times of high unemployment. We control for actual working hours in the main analysis.

(2) Workers in the private and the public sectors may differ in both observable and unobservable characteristics. Since people self-select into the two sectors, this could bias the estimated correlations. Relevant for our analysis, people choose between the two sectors according to their risk aversion. Dohmen et al. (2005) and Bonin et al. (2006) show, using an experimentally validated measure of risk aversion, that in Germany public sector workers are more risk averse than private sector workers. Barsky et al. (1997) show that in the United States individuals who are more risk averse tend to select into the public sector. Luechinger, Stutzer, and Winkelmann (2006) study self-selection into the government and private sectors and show that there are indeed substantial welfare gains from matching. In the present application, self-selection is likely to bias our results against finding a difference between the two sectors in the sensitivity of life satisfaction to fluctuations in the unemployment rate. Self-selection implies that the average individual in the public sector is more risk averse than the average individual in the private sector. As the life satisfaction of individuals with strong risk aversion is more sensitive to changes in the unemployment rate than is the life satisfaction of individuals with weaker risk aversion, the smaller response in the public sector than in the private sector is not just an artifact of self-selection bias. Rather, in the hypothetical case of random assignment of individuals to the two sectors, a larger number of strongly risk averse

individuals would be exposed to the greater uncertainty of the private sector and, hence, we would observe an even larger difference between the two sectors in the sensitivity of life satisfaction to changes in the unemployment rate.<sup>7</sup> Our estimates of the importance of economic security thus represent only a lower bound when extrapolated to the average person in the workforce.

## 4 Empirical Analysis

### 4.1 The Private/Public Sector Life Satisfaction Gap in Germany

#### 4.1.1 Data and Summary Statistics

The main empirical analysis is based on data from the GSOEP.<sup>8</sup> We use information from the 21 annual waves between 1984 and 2004 for West Germany. Because we are interested in the effects of unemployment on people active in the workforce, we restrict the sample to people who are employed full-time or part-time and who are between 18 and 65 years old. To our knowledge, this is the longest individual panel data set with information about both people's subjective well-being and their sector of employment.

Individuals' life satisfaction is measured with a single-item question on an 11-point scale: "How satisfied are you with your life, all things considered?" Responses range on a scale from 0 ("completely dissatisfied") to 10 ("completely satisfied"). In our sample of people with paid work, 6.5 percent report being completely satisfied with life (score=10) and about 52.4 percent report life satisfaction in the top three categories. About 1.2 percent fall into categories 0 to 3 at the bottom of the scale. On average, people's life satisfaction is at a level of 7.3 on the scale from 0 to 10. For a broader discussion on life satisfaction in Germany based on the GSOEP, see Frijters, Haisken-DeNew, and Shields (2004) and Stutzer and Frey (2004).

In Germany, there are two types of public sector workers: public servants ("Beamte"), who enjoy the strictest dismissal protection, and other people working in the public sector, who are employed under the regular labor law (Ebbinghaus and Eichhorst 2006). Over the entire period, we observe 15,110 individuals working in the private sector, and 5,654

---

<sup>7</sup> Fuchs-Schündeln and Schündeln (2005) make a similar argument about self-selection into occupations and the measurement of precautionary savings.

<sup>8</sup> The data used in this paper were extracted from the SOEP Database provided by the DIW Berlin ([www.diw.de/soep](http://www.diw.de/soep)) using the Add-On package SOEPMENU for Stata(R). SOEPMENU ([www.soepmenu.de](http://www.soepmenu.de)) was written by Dr. John P. Haisken-DeNew ([john@soepmenu.de](mailto:john@soepmenu.de)). See Haisken-DeNew (2005) for details. The SOEPMENU-generated DO file to retrieve the SOEP data used here is available from the authors on request. Any data or computational errors in this paper are ours.

individuals working in the public sector. Note that the Laender (the German equivalent of U.S. states) are the largest public sector employers in Germany. Of the individuals working in the public sector, 1,707 are public servants at some point in time. In total, we have 103,953 observations.

The empirical analysis uses regional unemployment data from Germany's Federal Statistical Office. Unemployment is measured at the first sub-central level (Bundesland). In the GSOEP, the two states, Rheinland-Pfalz and Saarland, are coded as one. Accordingly, we take the average unemployment rate of the two Laender weighted by their populations as of 1994.

Table 1 presents summary statistics of the main variables separately for individuals working in the private sector, the public sector, and as public servants. Individuals working in the public sector or as public servants differ somewhat in observable characteristics from individuals working in the private sector. For example, on average, people working in the public sector earn more than people in the private sector. They are also better educated. Since all these factors may be important in determining individuals' well-being, we control for them in the empirical analysis.

#### *4.1.2 Sectoral Differences in the Psychic Costs of General Unemployment*

The results for the private/public life satisfaction gap are presented in two steps: in a graphical analysis, raw differences are studied, while the main analysis applies multiple regression techniques. Figure 3 plots the unemployment rate (right axis) and the difference in life satisfaction between public servants and non public servants (left axis) in West Germany between 1984 and 2004. The bigger the difference, the more satisfied are public servants relative to non public servants. The raw differences show a clear relationship with the unemployment rate. If the unemployment rate increases, the life satisfaction differential grows; public servants become more satisfied relative to non public servants.

The results from the graphical analysis are studied further in three model specifications that allow us to quantify the observed correlation. The regressors include the mean adjusted annual rate of unemployment at the state level, a dummy variable that captures whether people work in the public sector (=1) or in the private sector (=0), and a dummy variable that captures whether people are public servants (=1) or not (=0). Since all public servants work in the public sector, the estimated coefficient for public servants shows the difference in life satisfaction of being a public servant (over and above the effect of working in the public sector) at the mean rate of regional unemployment. In order to see how the difference in life satisfaction between the public and the private sectors varies with the unemployment rate, the two variables for public sector workers are interacted with rate of unemployment. All the

regressions include both region (state) fixed effects to control for time-invariant differences between the Laender and year fixed effects to control for factors affecting West Germany as a whole in a given year. Further control variables are included step by step and introduced below. Robust standard errors are adjusted for clustering on the level of the individual.

Table 2 shows the main results. In all three specifications, the life satisfaction gap is calculated for the mean rate of regional unemployment, that is, a rate of 8.7 percent. Column 1 reports, based on an ordered probit estimation, that there is a statistically significant negative correlation between regional unemployment and the life satisfaction of people working in the private sector. If regional unemployment increases by one percentage point, the fraction of private sector workers reporting life satisfaction of 8 or higher is reduced by 0.9 percentage points. The interaction terms, whereby different levels of life satisfaction between the groups are taken into account, capture the differential consequences of general unemployment for public sector employees. The coefficient on the interaction term indicates that public sector employees who are not public servants are less affected by regional unemployment than are people working in the private sector. The estimated effect of a one percentage point increase in the unemployment rate is a reduction of 0.25 percentage point in the probability of experiencing high life satisfaction (a score of 8 or higher) for these workers (public sector but not public servant workers). The second interaction term, for public servants, indicates that they may be even less affected by regional unemployment than lower status public sector employees. However, the value of this interaction term is not statistically significantly different from the value of the interaction term for the non public servant employees of the public sector. The differential effect of regional unemployment on the life satisfaction of private and public sector workers in total indicates that general unemployment hurts the latter group much less.<sup>9</sup> These first results suggest that general regional negative effects of unemployment on society that are independent of sector-specific economic risks are relatively small.<sup>10</sup>

At the mean rate of regional unemployment, people working in the public sector (but not as public servants) report no statistically significant differences in life satisfaction from the life satisfaction of private sector workers. In contrast, public servants report higher life satisfaction, on average—not controlling for any observable differences between them and

---

<sup>9</sup> The test of whether people working in the public sector (including public servants) are less affected than others by general unemployment is highly statistically significant ( $\chi^2 = 13.30; p < 0.01$ ).

<sup>10</sup> The emphasis is on general regional effects because our empirical strategy does not allow us to capture national effects of unemployment (which are picked up statistically in the year fixed effects). In particular, fiscal consequences on the Laender of high unemployment are reduced by the horizontal and vertical transfers in the German federal system.

other workers. The probability of reporting high life satisfaction ( $\geq 8$ ) is 5.9 percentage points higher for public servants than for non public servants.

The two sectors may differ in other aspects besides (future) economic risks. In particular, the comovement of wages and working hours with economic shocks may be quite different between the two sectors and as a consequence may explain the sectoral differences in how workers' well-being is affected by high unemployment rates. Furthermore, as was apparent in the summary statistics, public sector workers differ in various observable characteristics such as education. In the following, we control for differences in wages, working hours, and other observable and time-invariant unobservable characteristics.

Column 2 of Table 2 presents the results of an ordered probit model that includes variables for observable differences among people in the sample. Household income comprises all compensation components, including bonuses and other income. The additional variables change the sensitivity of people's subjective well-being, but only slightly, with regard to regional unemployment across sectors. The negative effect of regional unemployment is two-thirds smaller for people working in the public sector who are not "public servants" than for private sector workers. The point estimate of the interaction term for public servants even suggests no effect of regional unemployment on their life satisfaction. The two interaction terms are jointly highly statistically significant. Thus, differences in the wage curves between the sectors cannot explain the finding that public sector workers are less affected than private sector workers by high levels of unemployment. The additional control variables for observed characteristics, however, explain about two thirds of the difference in average life satisfaction between public servants and non public servants. The results for the control variables are in line with previous findings for Germany. In particular, wages and household income are positively correlated with subjective well-being. Life satisfaction increases with the number of weekly working hours up to about 33 hours and decreases afterwards.<sup>11</sup> Unemployment of a person's partner results in substantially lower reported life satisfaction.

Column 3 of Table 2 shows the effect of regional unemployment on life satisfaction *within* individuals. We control for individual heterogeneity by adding individual fixed effects in an OLS regression. The qualitative results are the same as in columns 1 and 2. The test of whether the interaction terms between the rate of unemployment and public sector/public servant status jointly differ significantly from zero shows that people who work in the public

---

<sup>11</sup> The GSOEP also allows us to control for a more subjective measure of pressure at the workplace than actual working hours: the deviation between actual and desired working hours. To elicit desired work hours, participants are asked "If you could choose the extent of your hours at work, taking into account that your earnings would change correspondingly, how many hours per week would you like to work?" However, adding a variable to represent the deviation of actual from desired working hours does not change the results. The results are available from the authors on request.

sector are less affected by general unemployment than people who work in the private sector ( $p < 0.01$ ). Public sector employees (below the status of public servant) experience a negative effect from unemployment that is about one-third smaller than that experienced by workers in the private sector. When regional unemployment increases by one percentage point, life satisfaction is reduced by 0.025 points ( $= -0.036 + 0.011$ ) for the former, and by 0.036 points for the latter group. The point estimate for public servants is even slightly positive at 0.008 points (but not statistically different from zero). If the two groups of employees in the public sector are taken together (results not shown), the life satisfaction of workers in the private sector is reduced by 0.035 points, while that of workers in the public sector is reduced by 0.017 (with an increase of unemployment of one percentage point). To put the size of the effects in perspective, the negative effect on life satisfaction of an increase in unemployment from the lowest value in the sample (around 4 percent in Baden-Wuerttemberg in 1991) to the highest value (around 20 percent in West Berlin in 2003) is -0.56 points for people working in the private sector—similar to the negative effect of becoming personally unemployed (see Alois Stutzer and Bruno S. Frey, 2004).

The main results are robust to various changes in the specification and to sample restrictions (see Table A.1 in the appendix). The results hold when the sample is restricted to German nationals (column 1); when observations from people living in Berlin are excluded (column 2); and when the standard errors in the fixed-effects estimations are clustered on the state-year level instead of on the level of individuals (column 3).

In sum, our findings for Germany suggest that economic insecurity is an important reason for the reduced subjective well-being of workers during periods of high unemployment.

## **4.2 The Private/Public Sector Life Satisfaction Gap in the United States and the European Union**

In order to test whether the findings for West Germany are country specific, we replicate the analysis for the United States and for the member countries of the European Union. While the two data sets yield qualitatively similar results, each has clear limitations compared with the GSOEP.

### *4.2.1 Results for the United States*

In the United States as in Germany, public sector workers are also less exposed to economic shocks than people working in the private sector (see, for example, Richard B. Freeman, 1987). It is therefore to be expected that in the United States, too, public sector workers will suffer less than private sector workers from economic insecurity when general



unemployment is high. This predicted differential reaction to general unemployment in the United States is studied with data from the GSS.

*Data:*

The GSS is a repeated cross-section data set. We use the waves from 1976 to 2002 and restrict the sample to individuals working part-time or full-time. This leaves 17,534 observations for which the relevant information is available. Public sector workers are defined according to industry codes.<sup>12</sup> According to this definition, 1,338 individuals in the sample work in the public sector and 16,192 work in the private sector. Because the GSS does not have information about life satisfaction, we use a question about happiness. Respondents answer the following question on a three-point scale: “Taken all together, how would you say things are these days—would you say that you are very happy, pretty happy, or not too happy?” The analysis investigates the influence of the rate of unemployment on the probability that respondents answer that they are “very happy” (=1). The dichotomous dependent variable is 0 otherwise. Data for the rate of unemployment at the state level are from the Bureau of Labor Statistics (accessed through Haver Analytics).

*Results:*

Table 3 presents the results for the United States. Column 1 presents a logit estimation for private sector workers. In general, the results are qualitatively the same as for Germany but estimated with large standard errors. The first coefficient shows that higher regional unemployment is related to a lower proportion of workers stating that they are “very happy” ( $p < 0.05$ ). For an increase in the unemployment rate of one percentage point, the probability of reporting being very happy is reduced by 3.5 percentage points. In contrast, as seen in column 2, regional unemployment has no clear negative effect on the happiness of public bureaucrats. If anything, the partial correlation is positive; however, it is statistically imprecisely measured. Column 3 studies the differential effect of state level unemployment in one equation (whereby the rate of unemployment is mean adjusted). For people working in the private sector, a marginal effect of -0.7 percentage points is found (not shown in the table). For people working in the public administration, an increase in general unemployment has a marginal effect of 0.4 percentage points on happiness (however estimated with a large standard error). These findings suggest that, in the United States, too, general effects of high unemployment on society play a minor role compared with the effect of the increased

---

<sup>12</sup> The following ISCO codes are included in public administration: 907, 917, 927, 937, 960–965, and 590 (for the 1970 Industry codes); 900, 901, 910, 921, 922, 930-932, 412–414, 416–418, 423, and 431 (for the 1980 Industry codes).

insecurity for private sector employees. For private sector employees, the reduction in happiness during times of high unemployment is substantial. An increase in the state unemployment rate by a standard deviation of 2 percentage points is about half as bad as moving from the second-lowest income quartile to the lowest income quartile.

#### 4.2.2 Results for the European Union

For member countries of the European Union, the differential impact of general unemployment on life satisfaction is studied with data from the EB.

##### *Data:*

The EB is a repeated cross-section survey. Our analysis includes 13 European countries<sup>13</sup> for the years 1989 to 1994, since those are the only years for which information is available on people's life satisfaction and on the sector in which they work. The analysis includes 50,262 working individuals with non-missing variables. People working in the public administration and nationalized industries are defined as public sector. This leaves us with 20,787 people working in the public sector and 29,475 working in the private sector. People report their life satisfaction on a four-point scale in response to the following question: "On the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?" Data on national rates of unemployment are from the OECD.

##### *Results:*

Table 4 presents the estimation results for 13 European countries, based on similar specifications to those applied above. Qualitatively the results are very similar to those observed for West Germany and the United States. While there is a statistically significant negative partial correlation between the national rate of unemployment for private sector workers (column 1), there is no such correlation for public sector workers (column 2). However, the quantitative results for Europe depend on the specification. In column 3, smaller effects of national unemployment on workers' life satisfaction are estimated than those reported in columns 1 and 2.<sup>14</sup> Still, there is a clear indication that people in the private sector are more negatively affected by unemployment than are people working in the public sector. For the former, an increase in the general unemployment rate of one percentage point affects the probability of being either fairly or very satisfied by -0.5 percentage points. The respective

---

<sup>13</sup> Countries include Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, and the United Kingdom.

<sup>14</sup> Note that coefficients cannot be compared directly across ordered probit and ordered logit estimations, since threshold values are also separately estimated. Here, comparisons are for marginal effects (not reported).

effect for public sector employees is 0.2 percentage points. Again, general unemployment hurts those who benefit from the protection of public employment much less, suggesting that increased economic risks in the private sector rather than general negative effects are the main channel through which unemployment affects life satisfaction.

### 4.3 Sectoral Differences in Perceived Economic Insecurity

So far, the cost in subjective well-being due to general unemployment and the relative importance of general negative effects of unemployment and of effects on economic security are inferred from an *a priori* institutional distinction. This section analyzes whether there is direct evidence that people's *perceived* job security and their worries about their own economic situation depend on the rate of unemployment. The validity of the institutional distinction is studied by estimating separate partial correlations for workers in the private and the public sectors. The analysis is again for West Germany. The subjective measures are based on two questions in the GSOEP: "What is your attitude towards the following areas—are you concerned? (1) *Your job security?* and (2) *Your own economic situation?*" Respondents answer on a three-point scale: 1 "not concerned at all," 2 "somewhat concerned," and 3 "very concerned." On average, workers in the sample report concerns about job security at a level of 1.592 points, and concerns about their own economic situation at a level of 1.838 points.

Figure 4 shows the proportion of people who are "very concerned" about job security (left axis) and the average regional rate of unemployment (right axis) for West Germany between 1984 and 2004. Two patterns are worth mentioning: First, the level of perceived job security differs sharply between public servants and non public servants. While, on average, 13 percent of non public servants are "very concerned" about their job security, only 2 percent of public servants are so. Second, perceived job security correlates more with the rate of unemployment for non public servants than for public servants. Thus, the figure illustrates that the institutionalized sectoral differences in job security are also reflected in people's perceived job security.

Table 5 quantifies the effect of general unemployment on individuals' perceptions of their job security and their own economic situations, distinguishing between private sector and two categories of public sector workers. The dependent variables are based on three-point scales. Higher values indicate more concern over job security and own economic situation. The same control variables as in Table 2 are included. For each dependent variable, results of one ordered probit estimation and one OLS estimation with individual fixed-effects are reported.

The regressions support the general impression from Figure 4 and the proposed interpretation of the private/public life satisfaction gap pursued throughout the paper. Higher unemployment does increase worries about both job security and own economic situation for

individuals working in the private sector. The effect is larger on job security than on own economic situation. Consistent with the institutional difference in the exposure to economic risks, people in the public sector and, in particular, public servants, worry less than other workers about job security and their own economic situation (evaluated at the mean level of unemployment). Moreover, the concerns of public servants over job security and own economic situation barely change when unemployment rates increase. While the average concerns of private sector workers about their jobs increase by about 0.04 percentage point when general unemployment is one percentage point higher (OLS within estimation), there is no clear negative effect for public servants ( $-0.006 = 0.042 - 0.008 - 0.040$ ,  $t=0.97$ ). For concerns about their economic situations, partial correlations with unemployment of 0.027 for private sector workers, 0.020 for lower-level public sector workers, and zero for public servants are estimated. To put these findings in words, higher levels of unemployment have a smaller effect on perceived job security and worries about own economic situation for people working in the public sector than for others. The results show that public servants in particular, who are shielded the most from economic shocks, do not worry about job security—or at least do so independently of the level of unemployment.

## 5 Concluding Remarks

This paper explores the importance of possible reasons that people's life satisfaction decreases when the unemployment rate increases. High unemployment rates may influence life satisfaction either through general external effects on society or through their effects on individuals' economic insecurity, in particular with regard to their jobs. Our empirical strategy exploits institutional differences in the exposure to economic shocks. We focus on the private and the public sectors. Employees in the public sector are often at least partly shielded by stricter dismissal protection than their colleagues in the private sector, and need not fear bankruptcy of their organization.

The results show that people working in the public sector are much less affected by high levels of unemployment than are people working in the private sector. That is, life satisfaction of public sector workers is less sensitive to economic upheaval. This pattern is found by studying panel data for Germany (GSOEP), and the analysis is replicated using repeated cross-sectional data for the United States (GSS) and 13 European countries (EB). Overall, the negative effect of high unemployment on people's life satisfaction does not seem to be driven as much by negative general externalities of unemployment as by people's worries about economic distress, for example, due to losing their job. In the rich data set for Germany, the result holds up after controlling for other sectoral differences (for example, wages and

working hours), demographic differences, and time-invariant unobservable individual heterogeneity.

While the empirical approach taken here allows an analysis of the *distribution* of the costs of an increase in general unemployment, it leaves open a number of closely related issues. First, little is known about the institutions that determine the vulnerability of the economy to shocks in terms of life satisfaction. Future research might extend the scarce but interesting findings in this area. In a longitudinal sample of the European Union, more generous unemployment benefits are found to correlate positively with subjective well-being in the general population (Di Tella, MacCulloch, and Oswald, 2003). Based on the same data from EB, the negative effects of individual and general unemployment on reported life satisfaction are found to be larger in countries with low job protection (Leonardo Becchetti Stefano Castriota and Osea Giuntella, 2006).

Second, based on the evidence presented, no conclusion can be drawn as to whether job protection should be increased. While increased job protection might benefit insiders (see, for example, Andrew Clark and Fabien Postel-Vinay, 2007), it is also likely to make employers more reluctant to hire new workers, leading to longer individual unemployment spells and to higher general unemployment.

## 6 References

- Barsky, Robert; Kimball, Miles; Juster, Thomas and Shapiro, Matthew. "Preference Parameter and Individual Heterogeneity: An Experimental Approach in the Health and Retirement Study." *Quarterly Journal of Economics*, 1997, 112(2), pp. 537–79.
- Becchetti, Leonardo; Castriota, Stefano and Giuntella, Osea. "The Effects of Age and Job Protection on the Welfare Costs of Inflation and Unemployment: A Source of Ecb Anti-Inflation Bias?" CEIS Working Paper No. 245. Tor Vergata University, Rome, 2006.
- Blanchflower, David G. and Oswald, Andrew. *The Wage Curve*. Cambridge, MA: MIT Press, 1994.
- Bonin, Holger; Dohmen, Thomas; Falk, Armin; Huffman, David and Sunde, Uwe. "Cross-Sectional Earnings Risk and Occupational Sorting: The Role of Risk Attitudes," IZA Discussion Paper No. 1930, 2006.
- Card, David. "The Wage Curve: A Review." *Journal of Economic Literature*, 1995, 33(2), pp. 785–99.
- Clark, Andrew E. "Unemployment as a Social Norm: Psychological Evidence from Panel Data." *Journal of Labor Economics*, 2003, 21(2), pp. 323–51.
- Clark, Andrew E. and Oswald, Andrew J. "Unhappiness and Unemployment." *Economic Journal*, 1994, 104(424), pp. 648–59.
- Clark, Andrew and Postel-Vinay, Fabien. "Job Security and Job Protection," Mimeo. PSE, Paris, 2007.
- De Witte, Hans. "Job Insecurity and Psychological Well-Being: Review of the Literature and Exploration of Some Unresolved Issues." *European Journal of Work and Organizational Psychology*, 1999, 8(2), pp. 155–77.
- Di Tella, Rafael and MacCulloch, Robert. "Partisan Social Happiness." *Review of Economic Studies*, 2005, 72(2), pp. 367–93.
- \_\_\_\_\_. "Some Use of Happiness Data in Economics." *Journal of Economic Perspectives*, 2006, 20(1), pp. 25–46.
- Di Tella, Rafael; MacCulloch, Robert J. and Oswald, Andrew J. "The Macroeconomics of Happiness." *Review of Economics and Statistics*, 2003, 85(4), pp. 809–27.
- Dohmen, Thomas; Falk, Armin; Huffman, David; Sunde, Uwe; Schupp, Jürgen and Wagner, Gert G. "Individual Risk Attitudes: New Evidence from a Large, Representative, Experimentally-Validated Survey," IZA Discussion Paper No. 1730, 2005.
- Duncan Gallie, Michael; White, Michael; Cheng, Yuan and Tomlinson, Mark. *Restructuring the Employment Relationship*. New York: Oxford University Press, 1998.
- Ebbinghaus, Bernhard and Eichhorst, Werner. "Employment Regulation and Labor Market Policy in Germany, " 1991-2005. Discussion Paper No. 2505, Bonn: IZA, 2006.
- Economist, The. "France Faces the Future," March 30th, 2006.

- Falk, Armin and Zweimüller, Josef. "Unemployment and Right-Wing Extremist Crime," IZA Discussion Paper No. 1540, 2005.
- Freeman, Richard B. "How Do Public Sector Wages and Employment Respond to Economic Conditions?" D. Wise, *Public Sector Payrolls*. Chicago: University of Chicago Press, 1987, 183–213.
- Frey, Bruno S. and Stutzer, Alois. *Happiness and Economics: How the Economy and Institutions Affect Well-Being*. Princeton and Oxford: Princeton University Press, 2002a.
- \_\_\_\_\_. "What Can Economists Learn from Happiness Research?" *Journal of Economic Literature*, 2002b, 40(2), pp. 402–35.
- Frijters, Paul; Haisken-DeNew, John P. and Shields, Michael A. "Investigating the Patterns and Determinants of Life Satisfaction in Germany Following Reunification." *Journal of Human Resources*, 2004, 39(3), pp. 649–74.
- Fuchs-Schündeln, Nicola and Schündeln, Matthias. "Precautionary Savings and Self-Selection - Evidence from the German Reunification 'Experiment.'" *Quarterly Journal of Economics*, 2005, 120(3), pp. 1085–120.
- Green, Francis. *Demanding Work. The Paradox of Job Quality in the Affluent Economy*. Princeton: Princeton University Press, 2006.
- Haisken-DeNew, John P. "Soep Menu: A Menu-Driven Stata/Se Interface for Accessing the German Socio-Economic Panel," Mimeo, [www.soepmenu.de](http://www.soepmenu.de), 2005.
- Kinder, Donald R. and Kiewiet, Donald R. "Economic Discontent and Political Behavior: The Role of Personal Grievances and Collective Economic Judgments in Congressional Voting." *American Journal of Political Science*, 1981, 23(August), pp. 495–517.
- Krueger, Alan. "The Determinants of Queues for Federal Jobs." *Industrial & Labor Relations Review*, 1988, 41(4), pp. 567–82.
- Luechinger, Simon; Meier, Stephan and Stutzer, Alois. "Bureaucratic Rents and Life Satisfaction." *Journal of Law, Economics and Organizations*, 2008, 24(2), Forthcoming.
- Luechinger, Simon, Stutzer, Alois and Winkelmann, Rainer. "The Happiness Gains From Sorting and Matching in the Labor Market," Mimeo, IEW University of Zurich, 2006.
- Oester, Anna and Agell, Jonas. "Crime and Unemployment in Turbulent Times." *Journal of the European Economic Association*, 2007, 5(4), pp. 752–75.
- Raphael, Steven and Winter-Ebmer, Rudolf. "Identifying the Effect of Unemployment on Crime." *Journal of Law and Economics*, 2001, 41, pp. 259–83.
- Sanz-de-Galdeano, Anna and Turunen, Jarkko. "The Euro Area Wage Curve." *Economics Letters*, 2006, 92(1), pp. 93–98.
- Schwarze, Johannes and Härpfer, Marco. "Are People Inequality Averse, and Do They Prefer Redistribution by the State? Evidence from German Longitudinal Data on Life Satisfaction." *Journal of Socio-Economics*, 2005, Forthcoming.
- Stewart, Mark B. and Swaffield, Joanna K. "Constraints on the Desired Hours of Work of British Men." *Economic Journal*, 1997, 107(441), pp. 520–35.

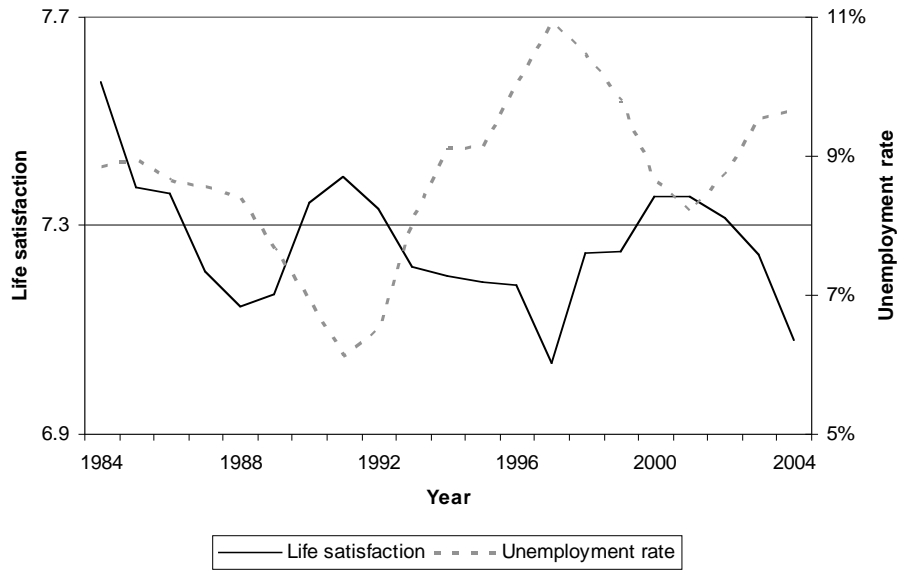
Stutzer, Alois and Frey, Bruno S. "Reported Subjective Well-Being: A Challenge for Economic Theory and Economic Policy." *Schmollers Jahrbuch*, 2004, 124(2), pp. 191–231.

Stutzer, Alois and Lalive, Rafael. "The Role of Social Work Norms in Job Searching and Subjective Well-Being." *Journal of the European Economic Association*, 2004, 2(4), pp. 696–719.

Winkelmann, Rainer and Winkelmann, Liliana (1998). "Why Are the Unemployed So Unhappy? Evidence from panel data." *Economica*, 65(257), 1–15.

Wolfers, Justin (2003). "Is Business Cycle Volatility Costly? Evidence From Surveys of Subjective Well-Being." *International Finance*, 6(1), 1-26.

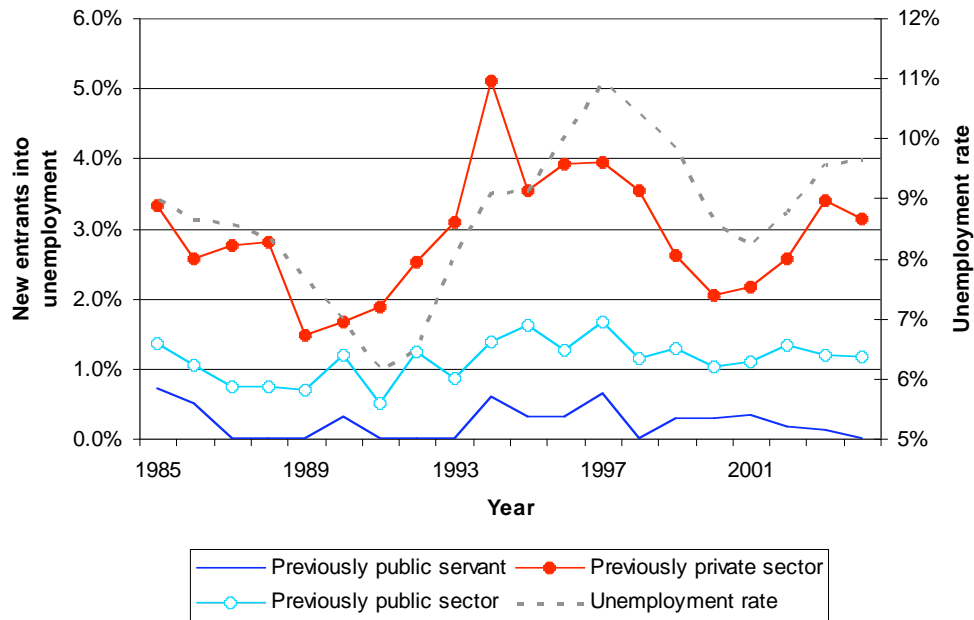




*Notes:* Life satisfaction of 18-to-65-year-old individuals working full-time or part-time in West Germany.

*Source:* GSOEP 1984–2004 and Federal Statistical Office Germany.

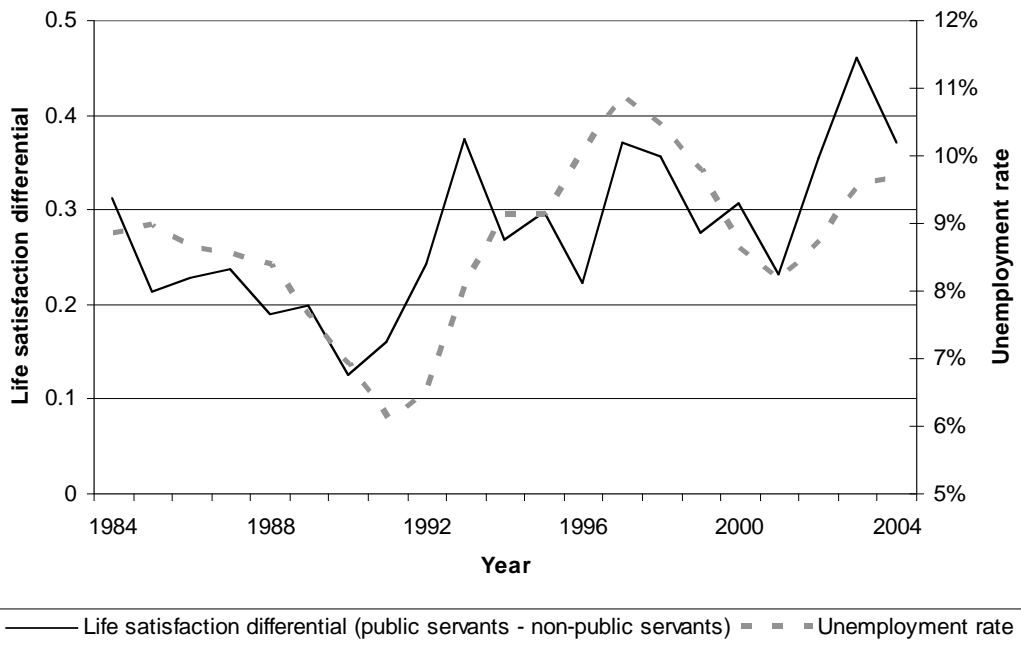
**Figure 1: Unemployment and Life Satisfaction of Working People in West Germany**



*Notes:* Share of individuals aged 18 to 65 who were unemployed at time  $t$  but who worked full-time or part-time at time  $t-1$  in West Germany.

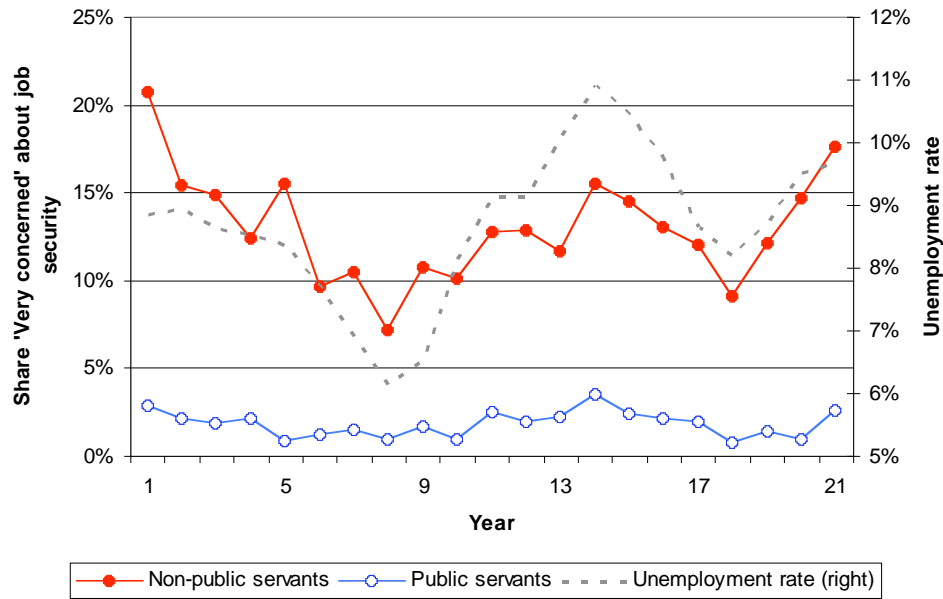
*Source:* GSOEP 1984–2004 and Federal Statistical Office Germany.

**Figure 2: New Entrants into Unemployment in West Germany**



Source: GSOEP 1984–2004 and Federal Statistical Office Germany.

**Figure 3: Unemployment and the Life Satisfaction Differential Between Public Servants and Non Public Servants**



Notes: Share reporting to be “very concerned” about job security in West Germany.

Source: GSOEP 1984–2004 and Federal Statistical Office Germany.

**Figure 4: Sectoral Differences in Perceived Job Security**

**Table 1: Summary Statistics**

|                                       | (1)                | (2)                | (3)                | (4)                |
|---------------------------------------|--------------------|--------------------|--------------------|--------------------|
|                                       | Private sector     | Public sector      | Public servant     | Total              |
| Life satisfaction                     | 7.254<br>(1.658)   | 7.368<br>(1.617)   | 7.538<br>(1.517)   | 7.283<br>(1.649)   |
| Concerns about job security           | 2.326<br>(0.707)   | 2.650<br>(0.593)   | 2.874<br>(0.381)   | 2.408<br>(0.694)   |
| Concerns about own economic situation | 2.110<br>(0.676)   | 2.316<br>(0.665)   | 2.545<br>(0.589)   | 2.162<br>(0.679)   |
| Actual working hours                  | 40.200<br>(11.201) | 37.943<br>(10.334) | 40.588<br>(9.450)  | 39.630<br>(11.032) |
| Ln (hourly income)                    | 2.119<br>(0.477)   | 2.264<br>(0.446)   | 2.529<br>(0.410)   | 2.156<br>(0.473)   |
| Ln (household income)                 | 10.252<br>(0.525)  | 10.317<br>(0.512)  | 10.475<br>(0.472)  | 10.268<br>(0.522)  |
| (Persons in household) <sup>1/2</sup> | 1.723<br>(0.398)   | 1.664<br>(0.385)   | 1.669<br>(0.377)   | 1.708<br>(0.395)   |
| Having Children (=1)                  | 0.464<br>(0.499)   | 0.409<br>(0.492)   | 0.421<br>(0.494)   | 0.450<br>(0.497)   |
| Female                                | 0.368<br>(0.482)   | 0.485<br>(0.500)   | 0.290<br>(0.454)   | 0.397<br>(0.489)   |
| Age                                   | 39.378<br>(10.874) | 41.548<br>(10.800) | 42.879<br>(10.612) | 39.926<br>(10.900) |
| Ln (years of education)               | 2.401<br>(0.208)   | 2.514<br>(0.233)   | 2.640<br>(0.224)   | 2.430<br>(0.220)   |
| German Citizen (=1)                   | 0.753<br>(0.431)   | 0.913<br>(0.281)   | 0.991<br>(0.094)   | 0.794<br>(0.405)   |
| European Citizen (=1)                 | 0.110<br>(0.313)   | 0.037<br>(0.189)   | 0.007<br>(0.083)   | 0.091<br>(0.288)   |
| Working part time (=1)                | 0.142<br>(0.349)   | 0.209<br>(0.406)   | 0.119<br>(0.323)   | 0.159<br>(0.365)   |
| Partner unemployed (=1)               | 0.029<br>(0.167)   | 0.021<br>(0.143)   | 0.013<br>(0.114)   | 0.027<br>(0.161)   |
| Number of observations                | 77,688             | 26,265             | 8,917              | 103,953            |
| Number of individuals                 | 15,110             | 5,654              | 1,707              | 18,962             |

Notes: Raw averages. Standard deviations are in parentheses.

Source: GSOEP 1984–2004.

**Table 2: Unemployment and Sectoral Differences in Life Satisfaction in Germany, 1984–2004**

| <i>Dependent variable:</i>            | (1)                 | (2)                             | (3)                 |
|---------------------------------------|---------------------|---------------------------------|---------------------|
| Life satisfaction (11-point scale)    | Ordered probit      | Ordered probit                  | OLS                 |
| State unemployment rate (UR)          | -0.022<br>(0.007)** | -0.021<br>(0.007)**             | -0.036<br>(0.012)** |
| Private sector                        |                     | Reference group                 |                     |
| Public sector (incl. public servants) | 0.023<br>(0.017)    | 0.019<br>(0.017)                | 0.013<br>(0.030)    |
| Public servant                        | 0.150<br>(0.028)**  | 0.049<br>(0.029) <sup>(*)</sup> | -0.056<br>(0.078)   |
| Interaction: UR × public sector       | 0.015<br>(0.006)**  | 0.014<br>(0.006)*               | 0.011<br>(0.009)    |
| Interaction: UR × public servant      | 0.009<br>(0.010)    | 0.007<br>(0.010)                | 0.033<br>(0.015)*   |
| Actual working hours                  |                     | 0.008<br>(0.002)**              | 0.027<br>(0.003)**  |
| (Actual working hours squared)/100    |                     | -0.012<br>(0.002)**             | -0.029<br>(0.003)** |
| Ln (hourly income)                    |                     | 0.163<br>(0.016)**              | 0.273<br>(0.026)**  |
| Ln (household income)                 |                     | 0.229<br>(0.015)**              | 0.215<br>(0.024)**  |
| (Persons in household) <sup>1/2</sup> |                     | -0.126<br>(0.024)**             | -0.163<br>(0.042)** |
| Without children                      |                     | Reference group                 |                     |
| Having children (=1)                  |                     | 0.001<br>(0.016)                | 0.037<br>(0.023)    |
| Not head of household                 |                     | Reference group                 |                     |
| Head of household                     |                     | -0.002<br>(0.016)               | 0.117<br>(0.041)**  |
| Male                                  |                     | Reference group                 |                     |
| Female                                |                     | 0.025<br>(0.018)                |                     |
| Age                                   |                     | -0.047<br>(0.004)**             |                     |
| (Age squared)/100                     |                     | 0.049<br>(0.005)**              | 0.020<br>(0.010)*   |
| Ln (years of education)               |                     | 0.061<br>(0.037) <sup>(*)</sup> | 0.062<br>(0.121)    |

Continues next page

|  |                  |                        |            |
|--|------------------|------------------------|------------|
| Non-EU foreigner                               |                  | Reference group        |            |
| German citizen (=1)                            |                  | 0.055                  |            |
|  |                  | (0.023)*               |            |
| European citizen (=1)                          |                  | 0.186                  |            |
|  |                  | (0.031)**              |            |
| Working full-time                              |                  | Reference group        |            |
| Working part-time (=1)                         |                  | 0.044                  | 0.037      |
|  |                  | (0.024) <sup>(*)</sup> | (0.034)    |
| Partner not unemployed                         |                  | Reference group        |            |
| Partner unemployed (=1)                        |                  | -0.222                 | -0.192     |
|  |                  | (0.027)**              | (0.036)**  |
| Married  |                  | Reference group        |            |
| Married, separated                             |                  | -0.408                 | -0.468     |
|  |                  | (0.034)**              | (0.057)**  |
| Single   |                  | -0.109                 | -0.080     |
|  |                  | (0.020)**              | (0.034)*   |
| Divorced                                       |                  | -.019                  | -0.032     |
|  |                  | (0.025)**              | (0.048)    |
| Widowed  |                  | -0.157                 | -0.478     |
|  |                  | (0.052)**              | (0.130)**  |
| State dummies                                  | Yes              | Yes                    | Yes        |
| Year dummies                                   | Yes              | Yes                    | Yes        |
| Individual dummies                             | No               | No                     | Yes        |
| Test for joint significance:                   | Yes**            | Yes**                  | Yes**      |
| $UR \times public\ sector$ and                 | $\chi^2 = 13.30$ | $\chi^2 = 9.53$        | $F = 5.46$ |
| $UR \times public\ servant \neq 0$             |                  |                        |            |
| Number of observations                         | 103,953          | 103,953                | 103,953    |
| Number of individuals                          | 18,962           | 18,962                 | 18,962     |
| Log (pseudo)likelihood                         | -189076.57       | -187450.25             |            |
| Pseudo R <sup>2</sup> /Adjusted R <sup>2</sup> | 0.0035           | 0.0120                 | 0.536      |

Notes: Ordered probit and OLS estimations. Robust standard errors in parentheses adjusted for clustering on the individual level.

Source: GSOEP 1984–2004.

Level of statistical significance: <sup>(\*)</sup>  $p < 0.1$  \*  $p < 0.05$ , \*\*  $p < 0.01$

**Table 3: Unemployment and Sectoral Differences in Happiness in the United States, 1976–2002**

| <i>Dependent variable:</i>      | (1)            |                        | (2)             |                        | (3)     |                        |
|---------------------------------|----------------|------------------------|-----------------|------------------------|---------|------------------------|
| Very happy (=1)                 | Private sector |                        | Public admin.   |                        | All     |                        |
| State unemployment rate (UR)    | -0.035         | (0.015)*               | 0.067           | (0.067)                | -0.033  | (0.015)*               |
| Private sector                  |                |                        | Reference group |                        |         |                        |
| Public sector                   |                |                        |                 |                        | 0.054   | (0.064)                |
| Interaction: UR × public sector |                |                        |                 |                        | 0.055   | (0.035)                |
| Male                            |                |                        | Reference group |                        |         |                        |
| Female                          | 0.156          | (0.036)*               | -0.080          | (0.136)                | 0.142   | (0.034)**              |
| Age                             | -0.067         | (0.012)**              | -0.059          | (0.045)                | -0.066  | (0.012)**              |
| (Age squared)/100               | 0.081          | (0.015)**              | 0.058           | (0.053)                | 0.079   | (0.014)**              |
| Non-white                       |                |                        | Reference group |                        |         |                        |
| White                           | 0.238          | (0.060)**              | 0.115           | (0.165)                | 0.223   | (0.057)**              |
| <i>Number of children:</i>      |                |                        |                 |                        |         |                        |
| 0                               |                |                        | Reference group |                        |         |                        |
| 1                               | -0.223         | (0.062)**              | -0.004          | (0.225)                | -0.211  | (0.058)**              |
| 2                               | -0.026         | (0.064)                | 0.066           | (0.233)                | -0.023  | (0.062)                |
| ≥ 3                             | -0.029         | (0.070)                | 0.112           | (0.271)                | -0.031  | (0.067)                |
| Working full-time               |                |                        | Reference group |                        |         |                        |
| Working part-time               | -0.066         | (0.051)                | -0.202          | (0.279)                | -0.068  | (0.050)                |
| <i>Income quartile:</i>         |                |                        |                 |                        |         |                        |
| First                           |                |                        | Reference group |                        |         |                        |
| Second                          | 0.166          | (0.059) <sup>(*)</sup> | -0.320          | (0.274)                | 0.093   | (0.059)                |
| Third                           | 0.307          | (0.062)**              | 0.175           | (0.265)                | 0.301   | (0.061)**              |
| Fourth                          | 0.557          | (0.063)**              | 0.508           | (0.303) <sup>(*)</sup> | 0.557   | (0.062)**              |
| (Household size) <sup>1/2</sup> | -0.109         | (0.058) <sup>(*)</sup> | -0.316          | (0.198)                | -0.119  | (0.056)*               |
| <i>Education:</i>               |                |                        |                 |                        |         |                        |
| Less than high school           |                |                        | Reference group |                        |         |                        |
| High school                     | -0.065         | (0.058)                | 0.290           | (0.325)                | -0.055  | (0.057)                |
| Associate/junior college        | -0.048         | (0.090)                | 0.496           | (0.378)                | -0.028  | (0.088)                |
| Bachelor's                      | 0.115          | (0.70)                 | 0.353           | (0.360)                | 0.111   | (0.068)                |
| Graduate                        | 0.157          | (0.080)*               | 0.250           | (0.393)                | 0.151   | (0.078) <sup>(*)</sup> |
| <i>Marital status:</i>          |                |                        |                 |                        |         |                        |
| Married                         |                |                        | Reference group |                        |         |                        |
| Widowed                         | -0.767         | (0.123)**              | -0.652          | (0.384) <sup>(*)</sup> | -0.755  | (0.117)**              |
| Divorced                        | -0.829         | (0.063)**              | -0.851          | (0.238)**              | -0.825  | (0.060)**              |
| Separated                       | -0.883         | (0.114)**              | -0.851          | (0.397)*               | -0.887  | (0.109)**              |
| Never married                   | -0.735         | (0.064)**              | -0.480          | (0.217)*               | -0.725  | (0.061)**              |
| Size of town/city (12 dummies)  | Yes            |                        | Yes             |                        | Yes     |                        |
| State fixed effects             | Yes            |                        | Yes             |                        | Yes     |                        |
| Year fixed effects              | Yes            |                        | Yes             |                        | Yes     |                        |
| Number of observations          | 13,578         |                        | 1,249           |                        | 14,830  |                        |
| Pseudo R <sup>2</sup>           | 0.0472         |                        | 0.0823          |                        | 0.0461  |                        |
| Wald $\chi^2$                   | 903.37         |                        | 152.81          |                        | 1008.38 |                        |

Notes: Logit estimations. Robust standard errors in parentheses adjusted for clustering on states in a given year.

Source: GSS 1976–2002.



**Table 4: Unemployment and Sectoral Differences in Life Satisfaction in 13 European Countries, 1989–1994**

| <i>Dependent variable:</i>        | (1)            |            | (2)             |            | (3)      |            |
|-----------------------------------|----------------|------------|-----------------|------------|----------|------------|
| Life satisfaction (4-point scale) | Private sector |            | Public sector   |            | All      |            |
| Unemployment rate (UR)            | -0.025         | (0.012)*   | 0.012           | (0.019)    | -0.012   | (0.013)    |
| Private sector                    |                |            | Reference group |            |          |            |
| Public sector                     |                |            |                 |            | 0.035    | (0.021)*   |
| Interaction: UR × Public sector   |                |            |                 |            | 0.007    | (0.004)(*) |
| Male                              |                |            | Reference group |            |          |            |
| Female                            | 0.077          | (0.014)**  | 0.049           | (0.022)*   | 0.063    | (0.015)**  |
| Age                               | -0.039         | (0.005)**  | -0.047          | (0.004)**  | -0.042   | (0.004)**  |
| (Age squared)/100                 | 0.044          | (0.006)**  | 0.055           | (0.005)**  | 0.048    | (0.005)**  |
| Ln(income)                        | 0.326          | (0.027)**  | 0.331           | (0.052)**  | 0.334    | (0.036)**  |
| Top income category (=1)          | 0.090          | (0.022)**  | 0.105           | (0.029)**  | 0.095    | (0.019)**  |
| <i>Marital status:</i>            |                |            |                 |            |          |            |
| Single                            |                |            | Reference group |            |          |            |
| Married                           | 0.098          | (0.024)**  | 0.125           | (0.036)**  | 0.106    | (0.024)**  |
| Living together                   | 0.018          | (0.034)    | 0.009           | (0.035)    | -0.011   | (0.029)    |
| Separated                         | -0.355         | (0.054)**  | -0.313          | (0.069)**  | -0.340   | (0.042)**  |
| Divorced                          | -0.209         | (0.036)**  | -0.168          | (0.040)**  | -0.192   | (0.029)**  |
| Widowed                           | -0.099         | (0.059)(*) | -0.056          | (0.056)    | -0.079   | (0.043)(*) |
| <i>Education to age:</i>          |                |            |                 |            |          |            |
| <15 years old                     |                |            | Reference group |            |          |            |
| 15-19 years old                   | 0.031          | (0.017)(*) | 0.055           | (0.028)(*) | 0.039    | (0.016)*   |
| >19 years old                     | 0.099          | (0.024)**  | 0.092           | (0.034)**  | 0.092    | (0.023)**  |
| Still in education                | 0.092          | (0.080)    | 0.090           | (0.112)    | 0.091    | (0.070)    |
| <i>Living area:</i>               |                |            |                 |            |          |            |
| Rural region                      |                |            | Reference group |            |          |            |
| Small town                        | -0.083         | (0.017)**  | -0.057          | (0.018)**  | -0.071   | (0.013)**  |
| Big town                          | -0.154         | (0.021)**  | -0.158          | (0.024)**  | -0.155   | (0.015)**  |
| Year dummies (6)                  | Yes            |            | Yes             |            | Yes      |            |
| Country dummies (13)              | Yes            |            | Yes             |            | Yes      |            |
| Number of observations            | 29,475         |            | 20,787          |            | 50,262   |            |
| R <sup>2</sup>                    | 0.112          |            | 0.114           |            | 0.112    |            |
| χ <sup>2</sup>                    | 7673.4**       |            | 4112.8**        |            | 8849.5** |            |

*Notes:* Ordered probit estimations. Robust standard errors in parentheses adjusted for clustering on country-year level. In the EB, income is reported in income classes, whereby the number and definition of income classes differs across countries and waves. The original information has, therefore, been translated into a number representing the mid-point of the respective class interval and converted into 2000 Euros. The variable “top income category” controls for the open-ended highest income category.

*Source:* EB 1989–1994.

*Level of statistical significance:* (\*)  $p < 0.1$  \*  $p < 0.05$ , \*\*  $p < 0.01$

**Table 5: Unemployment and Worries about Job Security and Own Economic Situation**

| <i>Dependent variable:</i>  | (1)                       | (2)                  | (3)                     | (4)                  |
|---|---------------------------|----------------------|-------------------------|----------------------|
|   | Job security              |                      | Own economic situation  |                      |
|   | Ord. Probit               | OLS                  | Ord. Probit             | OLS                  |
| State unemployment rate (UR)  | 0.061<br>(0.007)**        | 0.042<br>(0.005)**   | 0.037<br>(0.007)**      | 0.027<br>(0.004)**   |
| Private sector  | Reference group           |                      |                         |                      |
| Public sector (incl. public servants)   | -0.311<br>(0.019)**       | -0.061<br>(0.014)**  | -0.101<br>(0.018)**     | 0.013<br>(0.012)     |
| Public servant  | -0.796<br>(0.039)**       | -0.141<br>(0.035)**  | -0.385<br>(0.033)**     | -0.046<br>(0.032)    |
| Interaction: UR × public sector   | 0.002<br>(0.007)          | -0.008<br>(-0.004)*  | -0.001<br>(-0.006)      | -0.007<br>(-0.003)*  |
| Interaction: UR × public servant  | -0.040<br>(-0.013)**      | -0.040<br>(-0.005)** | -0.027<br>(-0.011)*     | -0.020<br>(-0.005)** |
| Control variables (see Table 2)   | Yes                       | Yes                  | Yes                     | Yes                  |
| State dummies   | Yes                       | Yes                  | Yes                     | Yes                  |
| Year dummies  | Yes                       | Yes                  | Yes                     | Yes                  |
| Individual dummies  | No                        | Yes                  | No                      | Yes                  |
| Test for joint significance:<br><i>UR × public sector</i> and<br><i>UR × public servant</i> ≠ 0 | Yes**<br>$\chi^2 = 10.24$ | Yes**<br>$F = 49.94$ | Yes*<br>$\chi^2 = 7.94$ | Yes**<br>$F = 14.89$ |
| Number of observations  | 103,953                   | 103,953              | 103,707                 | 103,707              |
| Number of individuals   | 18,962                    | 18,962               | 18,944                  | 18,944               |
| Log (pseudo)likelihood  | -92415.13                 |                      | -92232.41               |                      |
| Pseudo R <sup>2</sup> / Adjusted R <sup>2</sup>   | 0.073                     | 0.527                | 0.065                   | 0.530                |

*Notes:* Ordered probit and OLS estimations. Robust standard errors in parentheses adjusted for clustering on the individual level. The dependent variables are based on the questions “What is your attitude towards the following areas – are you concerned?” For columns (1) and (2): “*Your job security?*” and for columns (3) and (4): “*Your own economic situation?*” Respondents answer on a three-point scale: 1 “not concerned at all,” 2 “somewhat concerned,” 3 “very concerned”).

*Source:* GSOEP 1984–2004.

*Level of statistical significance:* (\*)  $p < 0.1$  \*  $p < 0.05$ , \*\*  $p < 0.01$

**Table A.1: Robustness Tests**

| <i>Dependent variable:</i>  | (1)                             | (2)                     | (3)                           |
|---|---------------------------------|-------------------------|-------------------------------|
| Life satisfaction (11-point scale)  | Only German citizens            | Without Berlin          | Clustered on state-year level |
| State unemployment rate (UR)  | -0.023<br>(0.008)**             | -0.039<br>(0.009)**     | -0.021<br>(0.004)**           |
| Private sector  |                                 | Reference group         |                               |
| Public sector (incl. public servants)   | 0.032<br>(0.019) <sup>(*)</sup> | 0.017<br>(0.017)        | 0.019<br>(0.009)*             |
| Public servant  | 0.049<br>(0.031)                | 0.048<br>(0.030)        | 0.049<br>(0.013)**            |
| Interaction: UR × public sector   | 0.011<br>(0.007) <sup>(*)</sup> | 0.015<br>(0.007)*       | 0.014<br>(0.003)**            |
| Interaction: UR × public servant  | 0.007<br>(0.010)                | 0.004<br>(0.012)        | 0.007<br>(0.004)              |
| Control variables (see Table 2)   | Yes                             | Yes                     | Yes                           |
| State dummies   | Yes                             | Yes                     | Yes                           |
| Year dummies  | Yes                             | Yes                     | Yes                           |
| Test for joint significance:<br><i>UR × public sector</i> and<br><i>UR × public servant</i> ≠ 0 | Yes*<br>$\chi^2 = 6.18$         | Yes*<br>$\chi^2 = 6.61$ | Yes**<br>$\chi^2 = 36.25$     |
| Number of observations  | 82,516                          | 100,781                 | 103,953                       |
| Number of individuals   | 15,490                          | 18,377                  | 18,962                        |
| Log (pseudo)likelihood  | -146,980.9                      | -181,360.54             | -187,450.25                   |
| Pseudo R <sup>2</sup>   | 0.0124                          | 0.0118                  | 0.0120                        |

*Notes:* Ordered probit estimations. Robust standard errors in parentheses adjusted for clustering on the individual level (columns 1 and 2) or for clustering on the states in a given year (column 3).

*Source:* GSOEP 1984–2004.

*Level of statistical significance:* <sup>(\*)</sup>  $p < 0.1$  \*  $p < 0.05$ , \*\*  $p < 0.01$