

# What a Difference Peers Can Make: The Impact of Work Norms on Unemployment Duration - A Regional Approach

Andreia Tolciu\*

## Abstract

Social interaction models, i.e. the changing sequence of actions between individuals who modify their behaviour under the influence of their peers, have rarely enjoyed as high a profile in economic analysis as they do today. This paper outlines a model of how social interactions among persons belonging to the same region might influence individual unemployment duration. The impact is assumed to be enhanced through social work norms shared by peers within the group. Building on a range of German data sets and derived from multilevel analysis, the results show that social interactions in terms of social work norms, in conjunction with socio-demographic and regional characteristics, have an effect on individual unemployment duration.

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**Keywords:** regional social interactions, social work norms, group influence, regional unemployment, religious influences

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\*Hamburg Institute of International Economics (HWWI), Heimhuder Str. 71, 20148 Hamburg, Germany | E-mail: [tolciu@hwwi.org](mailto:tolciu@hwwi.org)

# 1 Introduction

Social interaction models are defined in the economic literature as models in which the preferences, information or outcomes of different agents are more likely to be affected by other agents' behaviour than by price systems or market related strategies. The central idea of these models is that individuals interact locally, with a set of neighbours or a certain reference group (Conley and Topa, 2003).

In a broader sense, social interactions can be conceptualized as encompassing the effects of social norms, role models and social networks on human behaviour. These three aspects have been identified in the literature as diffusion channels through which the impact of social interactions among individuals emerges and their decision making process is subsequently influenced.

Building on a long history of sociological research on communities, the study of social interactions has generated a wide research agenda in all social sciences, with own tools and terminology. However, according to Manski (2000) economists seem to have long avoided the role of social interactions in explaining individual outcomes. The main aspect which has led researchers to treat it with reticence is the fact that decisions based on social interactions are difficult to distinguish from other related types of behaviour and are therefore difficult to isolate empirically.<sup>1</sup> However, the large number of theoretical and empirical economic papers which have been published in the last decade show that economists have increasingly become aware that, besides market interactions, social interactions are an important determinant in the economic decision-making process of an individual (Soetevent, 2004). Moreover, the results deriving from these studies underline that the observance of social interactions can be consistent with individual rationality, even where it may appear to be in contrast with economic advantage (e.g. *'rational actors often deploy norms to achieve their ends'*; Elster 1989, p.100).

The present analysis examines if and to what extent social interactions among persons belonging to the same regions might influence the individual unemployment

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<sup>1</sup>According to Manski (2000) three types of interactions can be identified: the first one regards endogenous interactions (i.e. the 'real' social interaction effects, which are relevant for the present analysis), in which the propensity of an individual to behave in a certain way varies with the behavior of the group. The second one refers to contextual interactions, in which an individual behaves under the influence of the exogenous characteristics of the group members. Finally, there are the correlated effects, in which individuals in the same group tend to behave similarly because they are self-selected, meaning that they have similar individual characteristics or face similar institutional environments.

duration. The impact is assumed to be enhanced through the social work norms shared by the group peers.

Being unemployed usually means that one cannot live up to the norm of earning one's own living, when such pressure exists. Unemployed persons are supposed to be exposed to certain social requirements coming from other members of their community. As a result, an internal drive emerges to comply with the norm to work. Not coping with the unwritten code of work moral and the expectations of the peer group brings feelings of embarrassment and shame for unemployed individuals. The further underlying logic of the analysis is straightforward: in regions where it is socially more acceptable to be unemployed (and therefore having weaker work norms), the jobless persons will have fewer incentives to shorten their duration of unemployment, that is to increase their search efforts in order to get a new job. Conversely, if there are high working norms in the peer group, the unemployed will be more likely to search for a job and thus, more likely to escape unemployment.

This paper is organized as follows: the second section provides an overview of the economic studies that deal with the impact of social norms on the individual unemployment duration. In order to clearly specify the theoretical framework used so far for the study of social norms, main concepts, theories and assumptions are presented succinctly. The third section of this paper highlights some basic aspects regarding the data and methodology used for the study, as well as a short discussion on the main controversial issues. Section four comprises a synthesis of current results obtained from multilevel estimations. Section five concludes by pointing to some political implications of the study.

## **2 Social work norms and unemployment**

In the economics literature, a social norm is defined as *'a behavioural regularity; that is [...] based on a socially shared belief how one ought to behave; which triggers [...] the enforcement of the prescribed behaviour by informal social sanctions'* (Fehr and Gächter 2000, p. 12).

This paper concentrates particularly on the labour market effects of work norms. They can be defined as being incorporated within the more general concept of 'social norms'. The 'work' component refers to the assumption that 'work' is a normative value shared by the whole society and that one has to work in order to earn a living.

The working norms should be, therefore, understood as a set of requirements and expectations that able-bodied individuals have to support themselves by employment, rather than by living off of handouts from others. According to Stutzer and Lalive (2004) the social norm to work is traceable at least back to the Apostle Paul's letter to the Thessalonians and is therefore deeply rooted, especially in communities with a Christian tradition.<sup>2</sup>

There are three major assumptions regarding the impact of social work norms on unemployment which have been tested and confirmed by the existing body of literature.

The first one does not touch directly upon social norms, but constitutes a prerequisite for the later analyses. Researchers have showed that unemployment exerts a serious, negative effect on the subjective well-being of jobless individuals. In other words, the subjective well-being of the unemployed is lower compared to that of employed people. Clark and Oswald (1994, p. 655) observe, for example, that *'joblessness depresses well-being more than any other single characteristic'* (including important negative situations such as divorce and separation). By using data from the British Household Panel, the authors came to the conclusion that the effect of being unemployed is significant and is negatively correlated with subjective well-being. Moreover, the effect is robust and quantitatively large across varied specifications. Studies conducted on the basis of panel analysis, such as Winkelmann and Winkelmann (1998) for Germany, Agerbo et al. (1998) for Denmark and Clark (2003) for England also underline the fact that the effect of unemployment on subjective well-being is relevant and that it is not a result of unobserved individual characteristics.

The second assumption that has been tested by the empirical literature is that the subjective well-being of the unemployed improves as the number of unemployed peers increases. In other words, unemployment becomes subjectively more bearable when it becomes a common experience. Clark (2006) finds evidence that dissatisfaction with the state of being unemployed declines over time. The reported well-being of unemployed persons may rise because they become better at budgeting (i.e. make appropriate use of reduced income), find new friends who are also unemployed and/or cut back on inefficient job search strategies. Kolm et al. (2003) confirm these results:

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<sup>2</sup>*'[...] we worked night and day, laboring and toiling so that we would not be a burden to any of you. We did this, not because we do not have the right to such help, but in order to make ourselves a model for you to follow. For even when we were with you, we gave you this rule: 'If a man will not work, he shall not eat' (2 Thessalonians 3:6-15).*

when unemployment is high, it is socially more acceptable to be unemployed, and the employed people will have fewer incentives to avoid unemployment. The explanation put forward by the authors is also connected to the subjective well-being of unemployed individuals. Interviews in the metropolitan area of Stockholm showed that being the only unemployed individual was often described by participants as being lonely and dull, compared to a living situation in which many of one's friends and acquaintances are also unemployed. Interviewees seemed to enjoy daily activities much more when these took place in the company of friends, something that is possible during the day if some of one's acquaintances are also unemployed. Kolm et al. (2003, p. 9) conclude that *'an increase in unemployment among an individual's friends and acquaintances is likely to reduce the social and psychological costs of being unemployed'*.

The last main finding of the current research on unemployment and social interactions brings together the concepts of unemployment, subjective well-being and social work norms. The well-being of unemployed people is correlated with the strength of the social work norm, meaning that the well-being of unemployed people is higher in communities where there is weaker work norm. Lindbeck et al. (1999, p. 3) explain this finding by arguing that, as the number of individuals who are unemployed increases, social pressure diminishes. Thus, living on transfer payments becomes less embarrassing when more individuals are doing likewise.

Same arguments are also put forth by the work of Stutzer and Lalive (2002). The authors use the voting behaviour and political orientations of citizens as an indicator for the strength of the work norm, which determines the duration of unemployment and an individual's choice to live on state welfare. The data used for the analysis was taken from a country-wide referendum on the level of benefits to be paid out to unemployed persons in Switzerland. The public discussion that took place before the vote, and the quantitative analysis conducted afterward, suggests that the proportion of voters in favour of reducing unemployment benefits in a community can be taken as a proxy for the strength of the belief that it is not right to live off of public funds. The social norm to take paid work reduces the duration of unemployment substantially.

A 'social norm effect of unemployment' is also found by Clark et al. (2008) for their analysis of Germany. By using data from the GSOEP (1984-2006), the authors come to the conclusion that higher regional unemployment rates hurt the unemployed

less, as their situation is more bearable if it occurs on a larger scale.

However, in all these studies, the interpretation of the causal relationship between social work norms and individual outcomes such as unemployment duration or living from public benefits is rather difficult. As noticed by Stutzer and Lalive (2004), there is also the possibility of reversed causation, meaning that a weak work norm may develop in structurally lagging regions, where poverty and high unemployment prevail. Therefore, both hypotheses that work norms determine individual behaviour and that the individual behaviour leads to the formation of a certain work norm are in equal manner plausible.

### **3 Data and methodology**

As seen from previous literature, progress is being made in including social work norms into economic models. Still, systematic empirical evidence is scarce. This doubtless reflects the data constraints and methodological problems that occur when trying to size up the impact of social work norms on individual behaviour.

For an empirical analysis, specific measurement methods are required that can capture a person's beliefs about how one ought to behave. However, existing data sets do not typically allow for a proper evaluation. In order to overcome this problem, a mix of information streams from several databases (both individual-level data and on the NUTS1 and NUTS2 aggregated data) is used for conducting this research.

An important point to make is that the present analysis relies only on data concerning the western part of Germany. This is due to the fact that, even almost two decades after German reunification, the structural differences regarding the labour market between the western and the eastern part are substantial. Moreover, while unemployment was perceived as an individual experience in the western part of Germany after reunification, in the eastern part it was seen as a collective fate, as it rapidly affected a large fraction of the population. As a consequence, being unemployed did not go along with stigmatisation and was not hidden as something to be ashamed of. On the contrary, it was perceived as a stroke of fate that bound people together and, therefore, received a certain social acceptance. Due to these aspects, the individual and collective behaviour towards unemployment was processed mentally and physically in a different manner than in the western part of Germany. Therefore, a joint examination of both German regions may lead to inaccurate results

both from a theoretical and methodological perspective.

In the following, the main data sets are presented succinctly.

The main data is from the IAB employment subsample (Beschäftigtenstichprobe 1975-2001, IABS-R01) provided by the Institute for Employment Research (IAB). This is a unique micro-level data set, including the employment history as well as the history of unemployment benefit receipt for two percent of all German employees subject to social insurance contributions for the period from 1975 to 2001. Self-employed people, family workers and civil servants are excluded from the data set. The specificity of this data set is represented by the incorporation of various socio-demographic variables at the individual level, such as age, gender, education, income while employed, occupation and data regarding periods of benefit receipt<sup>3</sup>, if any. This latter information is provided in spells, with exact dates at the beginning and end of the spell. A great advantage of the IAB sample is the possibility to identify the regional location of each registered individual.

The second important data set used for the analysis is the German General Social Survey (ALLBUS). This data set is a random, cross-section biennial survey that has been conducted since 1980 on the attitudes, behaviour, and social structure of people residing in Germany. The present analysis is based on information contained in the surveys conducted in 2000 and 2004<sup>4</sup>, and takes into account only the respondents living in the western part of Germany (sample size: 4076 individuals). The variables of interest for the analysis refer to details about individuals' opinions with regard to social benefits and the welfare state. This information is particularly relevant for the identification of a proxy that captures the strength of the social norm to work existing within a group of people (in this case for the people living in the same administrative district). The social norm to work should illustrate the belief that unemployed people ought to live off their own income.

Other data sets are provided by the Federal Statistical Office (Regional Statistical Offices, 2001) and the Protestant Church in Germany.

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<sup>3</sup>For further details on this data see Bender et al. (2000).

<sup>4</sup>As the sample size of the ALLBUS survey is relatively small, entries for these two survey years are pooled together and are used for building the social work norm proxy. The assumption behind this procedure is that social work norms emerge over time and do not easily change within short periods.

### 3.1 Measuring social norms - a regional approach

The main challenges of the present analysis refer to the difficulty of setting and quantifying two *sine qua non* elements of social interactions models: the reference group of an individual and the work norms shared by his/her reference group.

Formally, an individual's reference group can be defined '*as the set of people to which he/she attaches a non-zero weight in making the decision of interest*' (Soetevent, 2004).

Due to data constraints, models focusing on social interaction effects strongly simplify the specific links between individuals when defining who interacts with whom in the society. Most ad hoc reference group definitions put forward by empirical researchers are based either on social or geographical proximity.

The reference group definition depicted in the present analysis uses the geographical proximity (at the NUTS2 level - administrative districts) as an indicator for the reference group of an unemployed individual. According to Stutzer and Lalive (2004) the federal structure of a country provides good grounds for setting the reference group at the administrative district level, as one can assume that, due to the federal governance, the interaction within communities is significantly larger than in a centralized country. Unlike the situation in other countries (such as the USA and France), in the western part of Germany there is no evidence for a pronounced residential segregation between unemployed and employed people. Therefore, there is little doubt that the reference group of an individual is mixed, gathering both employed and unemployed people. In line with this idea, for the present analysis, the reference group of an individual is considered in a very broad manner, including all people living in an administrative district (NUTS2 level).

The second challenge, perhaps more nebulous, is the measurement of social work norms. In order to study the effect of the social work norm on individual behaviour, one has to assess a method to measure the strength of this social norm. The measurement should capture the level of belief within one community that unemployed people have to live off their own income. As data for a proper analysis of social interactions models is rather scarce, researchers have to rely on their 'intuition' about which methods would most likely overcome the data constraints.

My approach of measuring the strength of the social work norm within communities is based on the concepts of 'extrinsic' and 'intrinsic' work values.

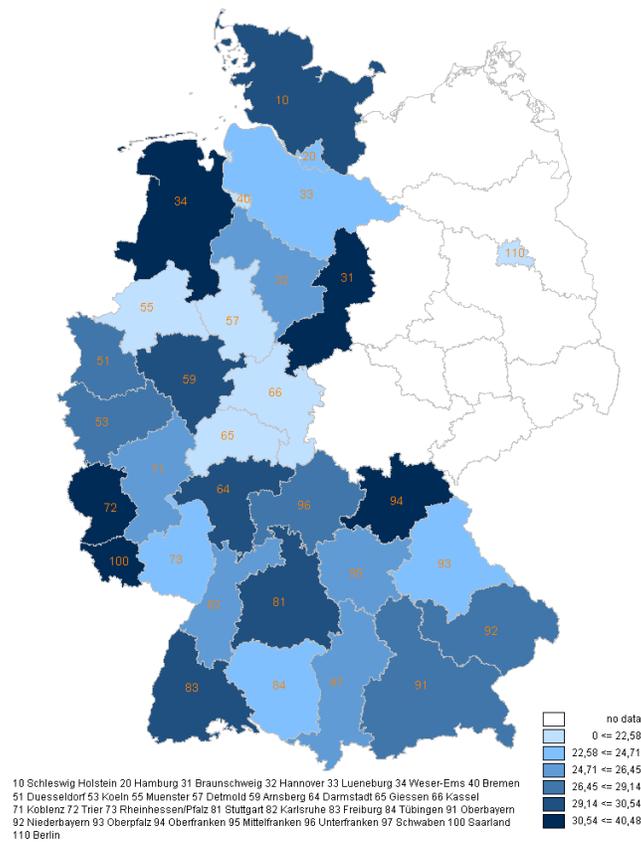
Extrinsic work values refer to external job outcomes and include '*work benefits*

and work security' (VanVianen and Van Dijk 2007, p.190). Furthermore, they reflect preferences for income, job security and in general benefits which are unrelated to the worker's tasks, e.g. a good pension plan or provision of generous holidays.

In contrast, intrinsic work values refer to the intrinsic outcomes gained from working. They include aspects such as *'broadening one's horizons, contributing to society, and having meaningful work'* (VanVianen and Van Dijk 2007, p.190).

In order to reflect the extrinsic work values, based on a factor analysis, I have constructed an 'index of work norms' composed of several variables (see the Appendix). They can, though to a limited extent, express a certain tendency regarding social benefits and work security attitudes within the respective region. The values obtained as a result from modelling this index are displayed in Figure 1:

Figure 1: Share of persons with weak work norms – Index values by region



Source: Allbus 2000/2004, own calculations.

Note: a darker color of the region points out to a higher share of people with weak work norms.

The intrinsic work values are captured in this analysis through the inclusion of a variable denoting the share of Protestant people living in a region. The idea behind this indicator is that, as argued firstly by Weber (1934), religious beliefs of individuals go hand in hand with economic outcomes. Though from a current perspective controversial - it is questionable whether nowadays the affiliation of a person with a church does say anything about the extent to which that individual internalises the contiguous religious thoughts - this assumption has gained increased attention in economics. Especially in the last decade, substantial progress has been made in understanding the role of religion for different economic outcomes such as labour supply, wages and wealth (among others, see the works of Keister, 2008; Chiswick and Huang, 2008; Ruffle and Sosis, 2007)<sup>5</sup>. Following the work of Weber (1934) a range of authors have analysed the relationship between religions denominations (Protestantism among them) and attitudes towards work. Referring to Protestantism, Fukuyama (2005) states that it created a work ethic- *'that is the valuing of work for its own sake rather than for its results'* - and admonished its adherents to adopt a moral conduit also outside their families, which was particularly relevant in creating a system of social trust.

Due the code of work ethics established through interpersonal relations and common beliefs, the variable capturing the regional share of protestant people does represent an appropriate proxy for the strength of the social work norms and social interactions within a region. Regarding the individual unemployment duration, this indicator should display an inverse relationship, meaning that in regions with a higher share of Protestants the individual duration of unemployment should be shorter.

### 3.2 Measuring unemployment

Though it provides detailed information both on individual employment and benefit receipt histories, the IABS-R01 subsample is marked by one shortcoming: due to collections procedures, the registered periods of unemployment benefit receipt can not be easily interpreted as actual periods of unemployment. Analysing the data without conducting several changes might lead to two problematic situations concerning the time an individual spends in unemployment: on the one hand, although transfer payments expired, an individual might still be unemployed. An underestimation of the actual unemployment duration would be the consequence. On the other hand, an

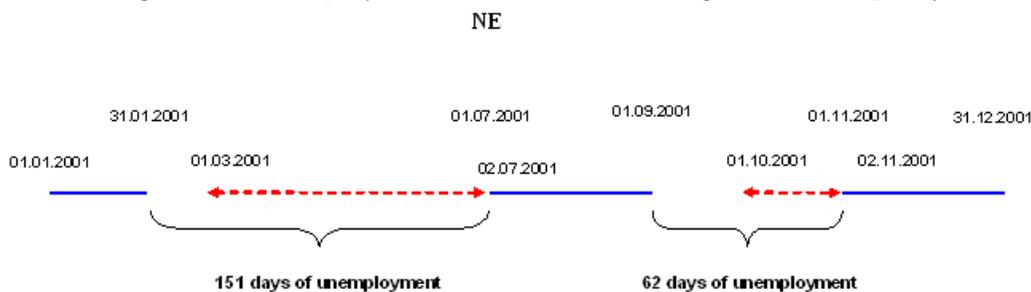
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<sup>5</sup>For an introduction to the economics of religion see the seminal work of Iannaccone (1998).

unemployed individual may still receive payments, though their participating in the labour market had stopped and they had already dropped out of the labour force.

In order to overcome this measurement problem, Fitzenberger and Wilke (2004) suggest a proxy for assessing the unemployment durations instead of periods of transfer payments as registered in the IABS-R01. This proxy (NE-NonEmployment) consists of the time between two employment spells, containing at least one period of transfer payments by the Federal Employment Agency. If no spell of employment is registered after a period of benefit receipt, the NE spell is considered as (right-) censored. Otherwise a transition from unemployment to employment occurred.

Figure 2: Unemployment duration according to the NE proxy



Note: the blue lines represent periods of employment, while the red ones mark periods in which the individual received unemployment benefits. The total duration of unemployment in the presented example for the year 2001 was 213 days. Should it be the case that in a certain period of time an individual was employed and carried out a so-called 'minijob' (Geringfügige Beschäftigung) but received simultaneously unemployment benefits, the spell is considered as an employment period.

The data set used for present analysis includes individuals in the age group 17 to 64 years displaying at least one spell of unemployment between 1999 and 2001. Information regarding their gender, nationality (German or otherwise) and education is also taken into consideration, as these indicators are assumed to play a role in explaining the individual duration of unemployment. Furthermore, information on regional indicators is included, as well as two variables which should capture a social interaction effect (the share of people with weak work norms and the share of Protestants living in a region).

In the following, in order to get a better data overview, some descriptive statistics are presented. The level-1 variables are extracted from the IABS-R01 data set and are at the individual level. The level-2 and level-3 variables are extracted (created) from ALLBUS 2000 and 2004 and other statistic sources.

Table 1: Descriptive Statistics

| Variable             | Obs   | Mean     | Std. Dev. | Min      | Max      |
|----------------------|-------|----------|-----------|----------|----------|
| Level 1 (Individual) |       |          |           |          |          |
| Time                 | 61413 | 202.14   | 183.39    | 0        | 1044     |
| Male                 | 61413 | .5893    | .49196    | 0        | 1        |
| Foreigner            | 59562 | .1315    | .33805    | 0        | 1        |
| Age                  | 61413 | 36.57    | 10.719    | 17       | 64       |
| Age <sup>2</sup>     | 61413 | 1452.87  | 837.79    | 289      | 4096     |
| Education            | 61383 | 1.4522   | 1.230     | 0        | 6        |
| Level 2 (NUTS2)      |       |          |           |          |          |
| UnemploymentRate     | 61413 | 7.7199   | 2.4284    | 4        | 16.1     |
| FirmOpenings         | 61413 | .0160025 | .001973   | .0130628 | .0202497 |
| FirmClosings         | 61413 | .0134255 | .0018602  | .010179  | .0178015 |
| ShareWorkMoral       | 61413 | 27.09217 | 4.691476  | 13.63636 | 40.47619 |
| Level 3 (NUTS1)      |       |          |           |          |          |
| JobOpenings          | 61413 | .1608386 | .0284732  | .0492993 | .2149684 |
| Protestant           | 61413 | 35.03881 | 11.2612   | 20       | 58.7     |

Note: 'Time' displays the individual duration of unemployment in days. 'Foreigner' is a dummy variable with a value equal to 0 if individual is German and equal to 1 otherwise. 'Male' is a dummy variable equal to 1 for males and equal to 0 for females. 'Age' is and individuals' age (in years). 'Education' is a variable displaying the education level of an individual. 'UnemploymentRate' is the regional unemployment rate, 'FirmOpenings/Closings' represent the number of firm who opened/closed in the region per employable person, 'ShareWorkMoral' captures the regional share of people with weaker work norms, 'JobOpenings' represents the regional number of jobs per employable person, and finally, 'Protestant' is the share of protestant people living in a region.

It is important to mention that, though for the second and third level variables, the apparent number of observations used in the regression analysis is round 60000, these variables are disaggregated at the individual level. Therefore, the actual number of observations is 30 (for the level-2 variables), respectively 10 (for the level-3 variables). Due to the hierarchical structure of the data (variables on the individual, NUTS2 and NUTS1 level), what actually happens is that a few data values from a small number of super-units are 'blown-up' into many more values for a larger sample of sub-units. As a consequence, the statistical analysis loses power, as the number of disaggregated cases lead to significance tests that reject the null-hypothesis far more often, meaning that it may end up with many 'significant' results which are actually spurious.

## 4 Results

As a first step, to set a basis for comparison, a simple OLS regression was carried out in order to gain insight into, among other things, the impact on the individual unemployment duration exerted by the portion of people with weak work norms. However, in such a model, though it was corrected for heteroskedasticity and it was taken into account that observations for the same regions may be correlated, all observations were pooled together without taking into account the hierarchical structure of the data. Accordingly, the basic OLS regression does not allow for the assessment of the influence of variables from a higher level on the dependent variable at the lowest level. Since the goal of this analysis is to determine the direct effect of individual and group-level explanatory variables, and to determine if the explanatory variables at the group level serve as moderators of individual-level relationships, a second analysis is undertaken by using a more appropriate technique.

### **A multilevel analysis**

One solution to the criticism concerning OLS models with hierarchical data, which has evolved rapidly in recent years, is the availability of multilevel modelling methods and software. They allow for integrating the individual and aggregate-level perspective by simultaneously estimating regression equations on both levels without violating important statistical assumptions of conventional multiple regression models (Raudenbush and Bryk, 2001; Snijders and Bosker, 1999). Thus it becomes possible, in principle, to disentangle the relative importance of individual and group (respectively regional)-level effects. Through employing a multilevel methodology, which allows the use of covariates at any of the levels of a hierarchy, it can be argued that the different unemployment duration of individuals is explainable, in part, by using variables associated with the characteristics of higher-level units.

A further assumption that sustains the use of a multilevel approach is that the covariance of error terms of two unemployed individuals within one region is not zero. It means that their unemployment durations are correlated to each other, partially because they are living in the same community and share a common environment. In other words, there might be some factors such as working values or regional circumstances that may affect their unemployment duration regardless of their qualifications, age, gender or nationality. The correlation between two unem-

ployed individuals (here referred to as the ‘intra-group correlation’) is discussed in more detail in the appendix.

The multilevel framework also readily accommodates the specification of random coefficients, as it allows intercepts and coefficients to vary across higher-level units and/or to be explained by variables belonging to higher levels. In the model, the intercept coefficients and the coefficient of one explanatory variable (the unemployment rate in the region) are assumed to vary across the regions. It means that the undertaken assumptions are: a) that the average individual unemployment duration is not the same across all regions (random intercepts) and b) that the effect of the unemployment rate on the individual unemployment duration also differs regionally (random slope).

### **Empirical Model:**

The formal three-level model is illustrated here for a basic case involving predictors at each level, with both the intercepts and a slope at the second level modelled to vary randomly.

The dependent variable is denoted by  $Y_{ijk}$  referring to an unemployed individual  $i$  living in the administrative district  $j$  (NUTS2 regions), in state  $k$  (NUTS1 regions).

The level 1 model for such data with one explanatory variable may be formulated as a regression equation:

$$Y_{ijk} = \beta_{0jk} + \beta_{1jk}X_{ijk} + e_{ijk} \quad (1)$$

where  $\beta_{0jk}$  is the intercept in level-two unit  $j$  within level-three unit  $k$ ,  $X$  is a predictor that varies over individuals (such as age, nationality, education, gender) and  $e_{ijk}$  is the random error for the  $i$ th individual in the  $j$ th administrative district, in  $k$ th state.

At level 2, the variation in the intercept is predicted by:

$$\beta_{0jk} = \delta_{00k} + \delta_{01k}Z_{01k} + u_{0jk} \quad (2)$$

where  $\delta_{00k}$  is the intercept,  $\delta_{01k}$  is the slope coefficient of the second level predictors  $Z_{01k}$  (such as the regional unemployment rate, the number of firms which opened/closed per region and the regional share of people with weaker work norms) and  $u_{0jk}$  is the random error component.

At level 3, variation in the intercept is predicted by:

$$\delta_{00k} = \gamma_{000} + \gamma_{00k}W_{00k} + v_{00k} \quad (3)$$

where  $\gamma_{000}$  is the intercept,  $W_{00k}$  is the third level predictor (such as the regional share of Protestants or the number of job openings per region) and  $v_{00k}$  is the error component, which along with the  $e_{ijk}$  and  $u_{0k}$  are assumed to be normally distributed with zero mean.

Since it was assumed that also the slope of one second level predictor  $Z_{01k}$  is random, the appending regression to (2) can be written as follows:

$$\delta_{01k} = \gamma_{010} + \gamma_{011}W_{011} + u_{01} \quad (4)$$

where  $W_{011}$  is a predictor (in my model the regional share of Protestants) which is meant to explain the variance of the slope. This predictor is introduced as an interaction term in the model.

By substituting (4) in (2) we have:

$$\beta_{0jk} = \delta_{00k} + \gamma_{010}Z_{01k} + \gamma_{011}W_{011}Z_{01k} + u_{01}Z_{01k} + u_{0jk} \quad (5)$$

Substituting (3), (5) and (2) into Equation (1) yields the three level model:

$$Y_{ijk} = \gamma_{000} + \gamma_{00k}W_{00k} + \gamma_{010}Z_{01k} + \gamma_{011}W_{011}Z_{01k} + \beta_{1jk}X_{ijk} + (e_{ijk} + u_{0jk} + u_{01}Z_{01k} + v_{00k}) \quad (6)$$

The first five terms on the right hand side make up the deterministic part of the model. The last terms in parentheses comprise the stochastic or residual portion, which in this example contains four random variables. The presence of more than one residual term distinguishes this model from standard regression models and the structure of the random part is central to the estimation procedures.

## Results Multilevel Analysis

The analysis was conducted gradually, beginning with the estimation of an “empty” model (model 0) without explanatory variables in order to establish the general variance of regional differences in unemployment duration.<sup>6</sup> Three random intercept models follow, into which individual variables (model 1), regional variables at the NUTS2 level (model 2) and, finally, the NUTS1 indicators (model 3) are incorporated as fixed effects. In model 4 the slope of one coefficient (*UnemploymentRate*) is assumed to be random, so that the regressions are run again with this specification. An interaction term is added, which acts as a moderator on the effect displayed by the unemployment rate. The results are presented in Table 3.

The ‘empty’ model (M0) shows significant variance in the intercept, i.e. the differences observed in the individual duration of unemployment across regions at the aggregate level are statistically significant. This does not change when the individual variables and the macro indicators (the NUTS2 and NUTS1 variables) are successively incorporated as explanatory variables into the second and third model.

The effect of level-1 variables (M1) can be interpreted as follows: older people, foreigners (not having German nationality) and men have a longer duration of unemployment. A higher education results in a reduction of the individual duration of unemployment.

Turning to the influence of the level 2 indicators (M2), it is showed that neither the number of firm openings, nor the number of firm closings has any significant effect on the individual unemployment duration. The examination of the regional unemployment rate reveals that it exerts a strong positive influence on the dependent variable: as expected, in regions with higher unemployment rates the individual unemployment duration is longer. Whether an individual resides in a region with a high proportion of people with weaker work norms has no statistically relevant association with the individual unemployment duration.

In the third model the social interactions-specific effect caused by the regional share of Protestants is not statistically significant, even though we would have expected it, as described by the theoretical literature. Moreover, the effect of job openings on the dependent variable is also not statistically significant.

However, things change significantly when not only the intercept, but also the

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<sup>6</sup>The calculations were performed using HLM6 software.

slope of the variable *UnemploymentRate* is assumed to vary across regions. In other words, it is assumed (and confirmed by the multilevel modelling), that the effect of the regional unemployment rate on the individual unemployment duration is not the same across all regions, i.e. the slope for some regions is steeper than for others. When allowing for random slopes across regions, there is a direct effect on the dependent variable exerted by the variable *ShareWorkMoral*, meaning that in regions with higher shares of people with weaker work norms, the individual unemployment duration is longer.

In order to explain the slope variance of the regional unemployment rate, a cross-level interaction term is introduced in the regression (*Unempl \* Protestant*). In this case, the *Protestant* variable influences the effect of the regional unemployment rate, by acting as a moderator. Put differently, a larger share of Protestant people decreases the impact of the regional unemployment rate on the individual unemployment duration. This implies that the individual unemployment duration is slightly shortened in regions with higher shares of Protestants, following a social interaction effect enforced through work norms.

Table 3: Results Multilevel Analysis:

|                                   | M0        | M1        | M2         | M3        | M4        |
|-----------------------------------|-----------|-----------|------------|-----------|-----------|
| Fixed Part Predictor              | Coeff.    | Coeff     | Coeff      | Coeff     | Coeff     |
| Intercept                         | 210.97*** | 210.97*** | 204.50***  | 204.12*** | 205.08*** |
| <b>Individual level variables</b> |           |           |            |           |           |
| Male                              |           | 11.89***  | 11.80***   | 11.80***  | 11.84***  |
| Age                               |           | 11.25***  | 11.25***   | 11.25***  | 11.25***  |
| Age <sup>2</sup>                  |           | -0.11***  | -0.11***   | -0.11***  | -0.11***  |
| Foreigner                         |           | 22.47***  | 22.82***   | 22.74***  | 22.82***  |
| Education2                        |           | -22.06*** | -22.14***  | -22.12*** | -22.01*** |
| Education3                        |           | -37.01**  | -22.14***  | -36.95*** | -36.69*** |
| Education4                        |           | -22.30*** | -22.25***  | -22.18**  | -21.94**  |
| Education5                        |           | -41.77*** | -41.71***  | -41.69*** | -41.55*** |
| Education6                        |           | -48.85*** | -48.890*** | -48.90*** | -48.65*** |
| Education7                        |           | 1.57      | 1.34       | 1.42      | 1.60      |
| <b>NUTS 2 Variables</b>           |           |           |            |           |           |
| Unemployment Rate                 |           |           | 6.21***    | 6.62***   | 6.12***   |
| Firm Openings                     |           |           | -6.20      | -456.11   | -         |
| Firm Closings                     |           |           | 636.99     | 1293.79   | -         |
| ShareWorkMoral                    |           |           | 0.42       | 0.44*     | 0.45*     |
| <b>NUTS 1 Variables</b>           |           |           |            |           |           |
| Job Openings                      |           |           |            | 43.98     | 97.90     |
| Protestant                        |           |           |            | -0.17     | 0.04*     |
| <b>Interactions Term</b>          |           |           |            |           |           |
| Unempl*Protestant                 |           |           |            |           | -0.16**   |
| <b>Random Part</b>                |           |           |            |           |           |
| $\sigma_e^2$                      | 33490.93  | 32255.25  | 32256.04   | 32256.02  | 32257.44  |
| $\sigma_{u0}^2$                   | 66.64*    | 60.12*    | 15.13***   | 11.34**   | 4.44***   |
| $\sigma_{v0}^2$                   | 325.69*** | 265.08*** | 3.44*      | 4.40*     | 0.16      |
| $\sigma_{u1}^2$                   |           |           |            |           | 0.32*     |

The dependent variable is 'Time' which displays the individual duration of unemployment in days. In this model, the intercept represents the average duration of unemployment across all regions and all individuals. The explanatory variables are defined as follows: 'Foreigner' is a dummy variable with a value equal to 0 if individual is German and equal to 1 otherwise. 'Male' is a dummy variable equal to 1 for males and equal to 0 for females. 'Age' is and individuals' age (in years). 'Education' is a variable displaying the education level of an individual (1-without education (reference category), 2-secondary school with vocational training, 3-baccalaureate without vocational training, 4-baccalaureate with vocational training, 5-degree from a university of applied science, 6-university degree, 7-unknown degree)). 'UnemploymentRate' is the regional unemployment rate, 'FirmOpenings/Closings' represent the number of firm who opened/closed in the region per employable person, 'ShareWork Moral' captures the share of people with a low working moral per region, 'JobOpenings' represents the regional number of jobs per employable person, and finally, 'Protestant' is the share of protestant people living in a region. All explanatory variables, except for the dummy variables are grand centered.

## 5 Conclusion

In this paper I have focused on the role of social interactions in explaining the individual duration of unemployment. By using an extensive data set with precise information about individual unemployment duration (micro-level data set, including the employment history, as well as the history of unemployment benefit receipt for two percent of all German employees subject to social insurance contributions for the period 1999 to 2001), I constructed an empirical model, in which I explored whether and to what extent the social work norms shared by individuals living in the same region have an impact on the length of time a person spends unemployed. The underlying assumption of the analysis was that in regions with a high percentage of people with an above average work moral, the duration of unemployment might be shorter due to the social pressure exerted on the unemployed individuals. The method used for the study was based on a multilevel analysis, as it contributes to the understanding of the effects community membership has on individual outcomes.

The results of such an analysis are relevant not only for academic research but also for their political implications. Under the premise that social interactions are highly relevant in shaping individual choices, no additional return would be gained from policies aimed solely at improving individual characteristics, such as vocational training or the provision of welfare subsidies. Instead, if it is assumed that an individual belonging to a certain peer group or community faces disadvantages on the labour market due to this affiliation, efforts should be channelled into programs focusing on that reference group or community as a whole.

Conversely, if the endogenous personal choices and the personal characteristics of an individual are far more relevant in determining his outcomes on the labour market<sup>7</sup>, there appears to be no sense in trying to tackle inequalities by addressing group-specific problems. If the unemployment duration of one individual does not reflect the composition of his/her group, but rather the lack of certain individual characteristics such as education or appropriate skills necessary for finding a job, policies oriented towards vocational training, further educational measures or better work placement counselling seem to be more appropriate.

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<sup>7</sup>Heining and Lings (2005, p 26) ) using a data set on un/employment for Germany, find that the overwhelming majority of differences in the hazard rate among individuals' outcomes can be explained by structural individual characteristics: *'Structural regional heterogeneity has surprisingly little effect on duration of unemployment. From this, we conclude that for leaving unemployment it does not matter where you are, but who you are'*.

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## 6 Appendix

### 6.1 Generating the proxy for the individuals' work norms

The variable indicating the proportion of people with weaker work norms was constructed in this study on behalf of five statements from the ALLBUS data set which express peoples' opinions with regard to welfare benefits and the role of the state in society. The first step in this process was to build up, focusing on these statements, a proxy which reflected the extrinsic work moral of individuals. The second step was, based on the obtained values, to assess the regional share of people depicting weaker (or higher) work norms. The five statements which were initially selected for the construction of the proxy are succinctly presented:

I. If social benefits, such as continued payment in the case of illness, unemployment compensations and early pensions are as high as nowadays, it leads only to the fact that people do not want to work anymore. Response options: 1 'I totally agree'; 2 'I rather agree'; 3 'I rather disagree'; 4 'I totally disagree'

II. Should social benefits be cut in the future, should things stay as they are, or should social benefits be extended? Response options: 1 'should be cut'; 2 'should stay as they are'; 3 'should be extended'

III. It is the responsibility of the state to meet everyone's needs, even in case of sickness, poverty, unemployment and old age. Response options: 1 'I totally agree'; 2 'I rather agree'; 3 'I rather disagree'; 4 'I totally disagree'

IV. What one gets in life hardly depends on one's own efforts, but rather on the economic situation, job opportunities, union agreements and the social services provided by the state. Response options: 1 'I totally agree'; 2 'I rather agree'; 3 'I rather disagree'; 4 'I totally disagree'

V. Income should not be based solely on the performance of an individual. Rather, everybody should have what they and their family need for a decent life. Response options: 1 'I totally agree'; 2 'I rather agree'; 3 'I rather disagree'; 4 'I totally disagree'

The first question that has to be answered is whether and to what extent these variables can be selected in creating a new variable. In other words: do all these indicators reflect, in terms of attitudes, the same thing? At first sight, the first two statements seem to indicate individuals' opinions concerning welfare benefits (and thus reflecting their extrinsic work values), while the latter three statements seem more to express peoples' opinions regarding broader economic themes such as the role of the state in the society. The second statement was already distinguished as being relevant in assessing the work norms of an individual (see for more details on this proxy the study of Stutzer and Lalive, 2002).

However, in order to identify whether and which statements can be combined for describing a new variable capturing the extrinsic work norms of individuals, a factor analysis was performed. Generally, factor analysis is helpful in reducing a set of observed variables into fewer unobserved variables called factors. It can also be used in grouping a range of interdependent variables into descriptive categories, such as ideology, intelligence or attitudes.

Initially, a principal components factor analysis (pcf) was conducted. Based on the stopping decision rule of eigenvalues greater than one, the five indicators loaded particularly on two factors, which explained 55.21 % of all variance. An additional scree test also suggested that out of these five variables two factors can be built, with some variables loading more on the first factor, and some others on the second factor. Further on, a varimax rotation was performed in order to get a better interpretation and labelling of each factor. This orthogonal rotation makes sense when one wants to create a new variable, in form of an index, without inter-correlated components (Kleinbaum et al., 1997). The results after the varimax rotation show that, as expected, the first and second indicators load on the same factor (Factor2), while the last three converge towards a different factor (Factor1). For details on the factor loadings and variances see Figure 3:

Figure 3: Factor Analysis

| Factor analysis/correlation   |                      |               |            |            |
|---|----------------------|---------------|------------|------------|
| Method: principal-component factors                                       | Number of obs = 4061 |               |            |            |
| Rotation: orthogonal varimax (Horst off)                                  | Retained factors = 2 |               |            |            |
|   | Number of params = 9 |               |            |            |
| Factor  | Variance             | Difference    | Proportion | Cumulative |
| Factor1   | 1.47027              | 0.17995       | 0.2941     | 0.2941     |
| Factor2   | 1.29032              | .             | 0.2581     | 0.5521     |
| LR test: independent vs. saturated: chi2(10) = 1189.94 Prob>chi2 = 0.0000 |                      |               |            |            |
| Rotated factor loadings (pattern matrix) and unique variances             |                      |               |            |            |
| Variable  | Factor1              | Factor2       | Uniqueness |            |
| Indicator 1   | -0.1689              | <b>0.7639</b> | 0.3880     |            |
| Indicator 2   | 0.2668               | <b>0.6998</b> | 0.4390     |            |
| Indicator 3   | <b>0.5334</b>        | 0.4273        | 0.5329     |            |
| Indicator 4   | <b>0.7530</b>        | -0.1307       | 0.4159     |            |
| Indicator 5   | <b>0.7205</b>        | 0.1317        | 0.4636     |            |
| Factor rotation matrix  |                      |               |            |            |
|   | Factor1              | Factor2       |            |            |
| Factor1   | 0.8074               | 0.5900        |            |            |
| Factor2   | -0.5900              | 0.8074        |            |            |

Note: Factor loadings are the weights and correlations between each variable and the factor. The higher the load of one indicator, the more relevant is this indicator in defining the factors dimensionality. A negative value indicates an inverse impact on the factor. In the above example, the two factors were retained because both had eigenvalues over 1. It seems that Indicator 1 and Indicator 2 define Factor1 while the other indicators define Factor2.

In the final stage of the factor analysis, the scoring coefficients were predicted for both factors. However, for the further analysis, another option was used, namely to create an index out of each cluster of variables (Nunnally and Bernstein, 1994). As Factor2 reflects better the individuals' extrinsic work norms, only the variables loading on this factor were then aggregated into an index:

$$Index(individual) = \frac{IndicatorI+IndicatorII}{2}$$

This index was calculated for each individual. A further step in creating the variable capturing the share of people with lower work norms within the regions was the delimitation between individuals with 'high' or 'weak' work norms, according to the values scored on the individual work indexes. This delimitation was based on the quantiles distribution of the individual indexes over all regions. A dummy variable was created, where 1 was given to persons with scores in the upper quantile (above p75) and 0 otherwise. Finally, the variable capturing the share of people with 'weak' work norms within each region was calculated (number of individuals with 1-values per region divided through the total number of individuals per region).

## 6.2 How much variance is explained by the model?

In multilevel modelling, the first step of analysis is usually to compute the so-called 'intercept-only model' with no explanatory variables in order to examine whether a significant proportion of variance is attributable to the aggregate level, comparable to a conventional ANOVA (Raudenbush and Bryk, 2001). The intra-group correlation coefficient (IGC) computed from the variance components shows how large (as a percentage of total variance) a possible group/regional effect is. The equation is as follows:  $Y_{ijk} = \gamma_{000} + e_{ijk} + u_{0jk} + v_{00k}$ , where  $\gamma_{000}$  is the usual intercept,  $v_{00k}$  is the residual at the third level,  $u_{0jk}$  is the residual at the second level and  $e_{ijk}$  is the residual at the individual level. The "empty model" does not explain any variance in  $Y$ , it only decomposes the variance into three independent components. Their variances are denoted by:  $var(e_{ijk}) = \sigma_e^2$ ,  $var(u_{0jk}) = \sigma_{u0}^2$  and  $var(v_{00k}) = \sigma_{v0}^2$ .

The expected correlation between two individuals living in the same administrative district is calculated as follows (and it takes into consideration that two individuals in the same administrative district must also be in the same state):

$$\rho_{level2} = \frac{\sigma_{v0}^2 + \sigma_{u0}^2}{\sigma_{v0}^2 + \sigma_{u0}^2 + \sigma_e^2}$$

and equals 0.11. In other words, the expected correlation of two individuals living in the same administrative district is 0.11 and meanwhile, 11% of all variance of the dependent variable is at the higher levels (NUTS2 and NUTS1 level).

On behalf of the level variances one can calculate the squared multiple correlation  $R^2$ , which in the multiple regression analysis is interpreted as the proportion of variance modelled by the explanatory variables. However, in multilevel regression analysis, the issue of explained variance is more complex, as there is unexplained variance at several levels to contend with. Moreover, if there are random slopes, the model is more complex and in this case the concept of explained variance has no unique definition anymore. Among the approaches that have been proposed, the one used for the present analysis consists of a sequence of models in which the amount of variance explained is calculated at each level.

The variance explained by introducing the Level1 variables is given by

$$R_1^2 = \left( \frac{\sigma_{e|mo}^2 - \sigma_{e|m1}^2}{\sigma_{e|mo}^2} \right),$$

where  $\sigma_{e|mo}^2$  is the lowest level residual variance for the baseline model (intercept-only model) and  $\sigma_{e|m1}^2$  is the lowest level residual variance for M1 and equals 0.036. In other words, 3.6% of the variance at the individual level is explained by the variables that were introduced in the model (age, nationality, education and gender).

The variance at the second level explained by the Level2 variables is given by:

$$R_2^2 = \left( \frac{\sigma_{u0|mo}^2 - \sigma_{u0|m2}^2}{\sigma_{u0|mo}^2} \right),$$

where  $\sigma_{u0|mo}^2$  is the second level residual variance for the baseline model and  $\sigma_{u0|m2}^2$  is the second level residual variance for M2 and equals 0.3638. In other words, 36.38 % of the variance at the second level is explained by the variables that are part of the model. Finally, the variance at the third level explained by adding the third level variables is given by:

$$R_3^2 = \left( \frac{\sigma_{v0|mo}^2 - \sigma_{v0|m3}^2}{\sigma_{v0|mo}^2} \right),$$

where  $\sigma_{v0|mo}^2$  is the third level residual variance for the baseline model and  $\sigma_{v0|m3}^2$  is the third level residual variance for M3 and equals 0.9864. That means, that 98.64% of the variance at the third level is explained by the Level3 variables.