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Working Paper

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Thünen-Series of Applied Economic Theory - Working Paper, No. 97

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Suggested Citation: Ochsen, Carsten (2008) : Subjective well-being and the duration of aggregate unemployment in Europe, Thünen-Series of Applied Economic Theory - Working Paper, No. 97, Universität Rostock, Institut für Volkswirtschaftslehre, Rostock

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Working Paper No. 97

Subjective Well-Being and the Duration of Aggregate Unemployment in Europe

von

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2008

Subjective Well-Being and the Duration of Aggregate Unemployment in Europe

Carsten Ochsen*

October 1, 2008

Abstract

This study examines whether the distribution of aggregate unemployment by duration affects individual well-being. Two hypotheses are provided to explain how the shares of short-term (up to 3 months) and long-term (more than 1 year) unemployed people could affect the well-being of the employed and unemployed: The severity hypothesis and the flow hypothesis. Using data from almost 300,000 individuals from 11 EU countries, an ordered probit estimator is used to analyze the impact of the distribution of aggregate unemployment by duration on individual well-being. We find significant evidence in favor of both the severity and the flow hypotheses. Hence, the fear of losing (or not finding) a job is more detrimental when the prospect is to remain unemployed for a longer time. At some point, however, both the employed and unemployed adapt to unemployment at the macro level. Using an alternative specification that allows for a duration-specific risk of becoming/being unemployed, we arrive at similar conclusions. What seems to bother people is thus not just the risk of becoming/remaining unemployed, but more so the risk of being out of work for 4 to 12 months.

Keywords: unemployment, unemployment duration, life satisfaction, happiness

JEL classification: J64, I31

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1 Introduction

This study examines whether aggregate unemployment affects subjective well-being not only quantitatively but also in a qualitative sense. More precisely, we analyze if the distribution of aggregate unemployment by duration affects individual well-being at a given level of unemployment. Two hypotheses are provided to explain how the shares of short-term (up to 3 months) and long-term (more than 1 year) unemployed people could affect the well-being of employed and unemployed people: The severity hypothesis and the flow hypothesis. With respect to the shares of short-term and long-term unemployed people, significant international differences exist. For example, the average share of short-term versus long-term unemployed people between 1980 and 2003 is 71% and 8% in the USA, and 8% and 64% in Italy. On the one hand, this could induce some relative skepticism or fear within the Italian labor force even if the unemployment rates were equal in both countries. On the other hand, the flow rate between employment and unemployment could be lower in the Italian labor market. The former argument is related to the severity hypothesis and the latter to the flow hypothesis.

According to the literature, the effects of unemployment on well-being are twofold. First, individual unemployment reduces well-being. The contemporaneous correlation between individual unemployment and well-being has been found in the literature[1] as sizable and significantly negative, and the question of whether unemployment duration matters at the individual level has been addressed in a number of studies.[2] Second, aggregated unemployment is negatively related to well-being. With respect to the quantitative effect, for example, Di Tella et al. (2001 and 2003), Graham and Pettinato (2001), and Ochsen and Welsch (2007) find a significant negative effect of aggregated unemployment on well-being at the individual level, robust to different specifications. This effect is commonly interpreted as an average risk of becoming or remaining unemployed. Furthermore, in addition to this quantitative effect, Ochsen and Welsch (2006) conclude that the average duration of unemployment is significantly negative related to subjective well-being. They argue that this is a proxy for the severity of unemployment at a given unemployment rate.

This paper contributes to the literature on unemployment and well-being by extending the approach of Ochsen and Welsch (2006). In doing so, we control for the aggregated effect and the distributional effect by considering the whole distribution of unemployment by duration. We provide two different theoretical explanations. First to be considered is the severity hy-

[1] See, for example, Blanchflower 2001, Björklund and Eriksson 1998, Clark 2003, Clark and Oswald 1994, Di Tella et al. 2001, Frey and Stutzer 2000, and Korpi (1997).

[2] See, for example, Clark and Oswald (1994), Winkelmann and Winkelmann (1998), Clark et al. (2001), Lukas et al. (2004), Clark (2006), and Clark et al. (2008).

pothesis, in which the negative effect of the unemployment rate is stronger the fewer the number of short-term unemployed people. Second is the flow hypothesis, which is based on a standard equilibrium unemployment model. According to this hypothesis, the negative effect of the unemployment rate will be alleviated by an increasing share of long-term unemployed people. With respect to the unemployed, the flow effect is equal to the adaption effect at the micro level.

In an alternative specification, we then fragment the unemployment rate into risk components that allow us to combine the level (quantitative) and distribution (qualitative) effects. We differentiate between three duration-dependent risk groups. In doing so, we are able to analyze what drives the overall effect of aggregated unemployment, level or distribution. For all models, we additionally consider subgroups that refer to the labor market status, education level, gender, and age. This is necessary, with respect particularly to the labor market status, because it is reasonable to believe that those who do not supply labor are less or unaffected entirely by aggregated unemployment.

Using data from almost 300,000 individuals from 11 EU countries drawn from the Eurobarometer, an ordered probit estimator is used to analyze the impact of duration and risk of unemployment on individual well-being. The major results, first, are that we find significant evidence for the severity hypothesis on unemployed and working people. Second, we also find significant evidence for the flow hypothesis for almost all subgroups. According to our results, a (combined) U-shape effect of the distribution of unemployment by duration on well-being exists for employed as well as unemployed individuals. That is, both the share of short-term unemployed people and the share of long-term unemployed people mitigate the negative effect of aggregated unemployment. Third, with respect to the duration-specific risk of becoming/remaining unemployed, only the (expected) duration of 4 to 12 months of unemployment reduces the well-being of the employed and unemployed. With respect to quantitative and qualitative effects, this means that the opposing effects negate each other. What seems to bother people is thus not simply the risk of becoming/remaining unemployed, but more accurately, the risk of staying out of work for 4 to 12 months. Fourth, the unemployment rate significantly reduces the well-being only of those who are working. For the unemployed, the estimated effects are negative but not significant. The well-being of those who do not supply labor is unaffected by the unemployment rate. Finally, a further result that is important to the literature is that the quantity (or real average risk) effect of the unemployment rate has doubled if we control for the quality of unemployment in terms of duration. Hence, the effect of the unemployment rate on well-being exhibits a considerable positive bias in usual specifications.

The paper is organized as follows. In the next section, we provide the theoretical framework. Section 3 describes the data and the method, and

section 4 provides the results. Section 5 states the conclusion.

2 Theoretical Framework

A question that has been addressed at the individual level is whether individuals adapt to unemployment, so that longer-duration unemployment has a smaller effect on subjective well-being than does shorter-duration unemployment. This is sometimes referred to as the adaption hypothesis. In contrast to this, it is argued that long-term unemployment is worse as job offers dry up or despair sets in. Hence, there is no adaption to unemployment. The empirical evidence on this issue is mixed. Clark and Oswald (1994) find evidence in favor of the adaption hypothesis. Clark et al. (2001) analyze data from Germany and find that the psychological impact of current unemployment is lower for those who have experienced more unemployment in the past. However, according to Clark (2006), Clark et al. (2008), Lukas et al. (2004), and Winkelmann and Winkelmann (1998) people's well-being does not seem to adapt to the status of being unemployed. In addition, Clark et al. (2008) provide evidence of some habituation to unemployment of women after four years.

With respect to the duration of unemployment at the macro level, only one paper exists. Ochsen and Welsch (2006) argue that the annual unemployment rate incorporates not only the average risk of being/remaining unemployed, but also the (expected) severity of unemployment. They find that severity, measured by the share of long-term unemployment, has a separate effect on subjective well-being. This indicates that the fear of losing (or not finding) a job is more detrimental when the alternative is remaining unemployed for a long time. With respect to the issue of adaption to individual unemployment, this suggests that at the very least, people do not expect to adapt to unemployment. Hence, to some extent, the results are in line with the finding that people's well-being does not seem to adapt to the individual status of unemployment.

With respect to the distribution of unemployment by duration, Ochsen and Welsch (2006) consider only the share of long-term unemployment. However, it is possible that the exclusion of other duration shares induces an omitted variable bias on the parameter for the share of long-term unemployed people. For example, according to our data, the share of short-term unemployed people is positively correlated with subjective well-being ($r = 0.13$) and negatively correlated with the share of long-term unemployed people ($r = -0.85$). In this case, omitting the share of short-term unemployed people induces a negative bias on the parameter for long-term unemployed people, given that at least a third group (e.g., medium-term unemployed people) exists. To analyze the hypothesis whereby the severity of unemployment affects individual well-being, we consider the complete

distribution of aggregated unemployment by duration.

For the sake of simplicity, we assume that well-being (W) is a function of a vector of individual characteristics ($\mathbf{X}$) and the unemployment rate (u). In addition, we argue that the severity (S) of unemployment affects well-being likewise.

$$W(\mathbf{X}, u, S) \equiv W(\mathbf{X}, u, s_S). \tag{1}$$

In our opinion, severity could be approximated more accurately by the share of short-term unemployed people (s_S), which is inversely related to severity. This is in line with the literature on unemployment duration. For example, Blanchard and Diamond (1994) argue that the exit rate from unemployment is a decreasing function of unemployment duration. The central assumption in this framework is that firms hire the applicant who has been unemployed for the shortest amount of time. Hence, the smaller the share of short-term unemployed people, the lower the probability that firms will hire a new worker. Similarly, Pissarides (1992) shows that allowing for loss of skill during unemployment increases the persistence of unemployment shocks in the following periods, because vacancy creation depends on the skill distribution of the workforce. Again, the fewer short-term unemployed individuals available to firms, the less likely it is that those firms will create new jobs.

With respect to equation (1), we assume that $W' > 0$ and $W'' > 0$, for a given set of individual characteristics and rate of unemployment. That is, for example, a drop in the share of short-term unemployment from 50 to 30 percent has a larger effect than a drop from 30 to 10 percent. The effects on well-being of the employed and unemployed are expected to be similar, since an increase in the severity of unemployment increases the unemployment spell, on average, of those who will become unemployed in the future and those who are actually unemployed.

Our second hypothesis relates to the labor market flow. The probability of becoming unemployed depends on the flow from employment to unemployment. The smaller the proportion of workers who become unemployed for a given unemployment rate, the less severe the negative effect of aggregated unemployment will be on well-being. For the unemployed, two explanations are obvious. First, the unemployed could adapt to the unemployment rate, even if they do not adapt to the individual status of unemployment. Put differently, what counts is individual status and the longer people are out of work, the more they realize that the unemployment rate is merely related fractionally to individual reemployment probability. An alternative explanation that has the same effect on well-being from a qualitative perspective is related to the Blanchard and Diamond (1994) paper. Firms could choose an increasing number of long-term unemployed

people if the share of long-term unemployed people is comparatively large, given that there are no distribution effects on job creation. Second, long-term unemployed people do not adapt to the unemployment rate because they realize that reemployment probability decreases with the duration of unemployment. In this case, the well-being of unemployed people decreases with the flow probability into employment. However, this is equal to the severity hypothesis, because it is observed empirically that the shares of short-term and long-term unemployed people are correlated negatively (as mentioned above $r = -0.85$).

According to the flow hypothesis, well-being is a function of labor market flows (F). In addition, well-being is a function of $\mathbf{X}$ and u, as in equation (1). These flows could be approximated by the share of long-term unemployed people (s_L), which is inversely related to the flow quantity.

$$W(\mathbf{X}, u, F) \equiv W(\mathbf{X}, u, s_L) \tag{2}$$

Again, we assume that $W' > 0$ and $W'' > 0$ for the employed and those unemployed who adapt to the unemployment rate (for a given set of individual characteristics and unemployment rate).

The flow effects can be derived from the standard equilibrium unemployment model. In this approach, the flow from unemployment to employment is equal to the flow in the opposite direction

$$pU = \lambda E. \tag{3}$$

U is the number of unemployed and E is the number of workers. On average, an unemployed worker finds a job during a period with the probability p. The equilibrium in search and matching models usually depends on a measure of the tightness of the labor market defined as the ratio of vacancies to unemployed, $\theta = V/U$. The probability p depends on labor market tightness θ because it determines the success of the search. Finally, the probability that a job will be destroyed by an idiosyncratic shock in a period is given by λ. Dividing equation (3) by $E+U$ and rearranging yields the unemployment rate:

$$u = \frac{\lambda}{\lambda + p(\theta)} \tag{4}$$

The flow out of unemployment, $p(\theta)u$, can be interpreted as a weighted average with weights given by the distribution of unemployment by duration. This follows directly from

$$pu = p(u_1 + u_2 + ... + u_n) = p\sum_i risk_i = p\sum_i \frac{u_i}{u}u = p\sum_i s_i u. \tag{5}$$

The unemployment rate u is the average risk of being/remaining unemployed. Using the information on the distribution of unemployment by duration, it is possible to segment the unemployment rate into duration-specific groups, $u_i = U_i/(E+U)$. The term $risk_i$ is the probability of being unemployed with a specific duration of that unemployment. Stated differently, the risk of being unemployed is the sum of duration-dependent risks ($u = \sum_i risk_i$). In addition, $risk_i$ is equal to the unemployment rate weighted by the duration-dependent group size $s_i = U_i/U = u_i/u$.

Assume that the reemployment probability for a specific unemployed person depends on the duration of his or her unemployment and decreases with an increasing number of unemployment periods. In this case, for each duration-specific group U_i, there exists a duration-specific reemployment probability $p_i(\theta)$.[3]

The steady state unemployment rate is given as

$$u = \frac{\lambda}{\lambda + \sum p_i(\theta) s_i}. \tag{6}$$

In the empirical part of the paper we distinguish between three different duration groups only, due to data availability. Hence, for a model with short-term (S), medium-term (M) and long-term (L) unemployed, steady state equilibrium unemployment is given by

$$u = \frac{\lambda}{\lambda + p_S(\theta) s_S + p_M(\theta) s_M + p_L(\theta) s_L}. \tag{7}$$

The framework allows for the following conclusions.[4] For given (decreasing) values of the duration-dependent probabilities, it follows from equation (7) that the larger the share of long-term unemployed people, s_L, the lower the flow quantities; hence, the probability that an employed person becomes unemployed, λ, and an unemployed person becomes employed, p, respectively. This is because s_L corresponds to the lowest reemployment probability and if this share increases, at least one of the remaining higher reemployment probabilities will be weighted lower.

This means that employed people could be interested in a large share of long-term unemployed people because this reduces the flow into unemployment; hence, the probability of becoming unemployed. From this, it follows that the well-being of employed people and the share of long-term unemployed people are positively related. The same applies to unemployed

[3] Hence, we assume the existence of (aggregated observed) duration dependence.

[4] From equation (7), it follows that the larger s_S (s_L), the smaller (larger) the unemployment rate. Hence, the unemployment rate is negatively related to s_S and positively correlated with s_L. According to the data used, the correlation coefficient for u and s_S is -0.40, and for u and s_L it is 0.48. Hence, the data correspond with the model.

people if they adapt to the unemployment rate. The opposite happens if duration dependence is negatively related to the well-being of unemployed people.

Figure 1 summarizes the two approaches. According to the severity hypothesis, the well-being of both employed and unemployed people is positively related to the share of short-term unemployed people (blue curve). Likewise, we can argue alternatively and somewhat simply that the share of long-term unemployed people is inversely related to the well-being of unemployed people if duration dependence affects their well-being negatively (blue curve). In contrast, according to the flow hypothesis, a positive effect on well-being exists for the share of long-term unemployed people, assuming the employed and unemployed people adapt to the unemployment rate (green curve).

It is also possible that both the severity hypothesis and the flow hypothesis are relevant. Consider a situation with a large share of short-term unemployed people, as is the case in the USA and was the case in most European countries in the (early) 1970s. According to the severity hypothesis, well-being decreases with the share of short-term unemployed people. With respect to the distribution of unemployment by duration, this is what happened in most European countries in the 1980s and, contemporaneously, the share of long-term unemployed people increases. For the employed, this means that the probability of becoming unemployed decreases while for the unemployed, we argue that the adaption effect occurs at the macro level (flow hypothesis). That is, well-being is positively related to the share of long-term unemployed people. This combined hypothesis has a U-shape effect (dotted curve).[5]

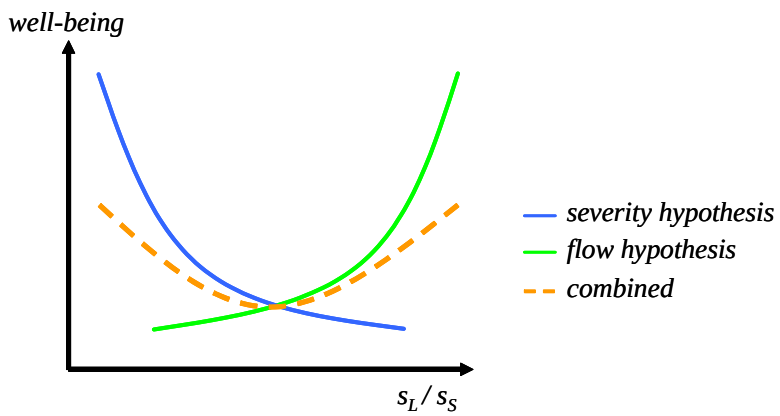

Figure 1: Well-being and the distribution of unemployment by duration

[5] Note that the combined curve would have an inverted U-shape if the second derivations of well-being with respect to the shares were negative.

We additionally fragment the unemployment rate into duration-specific risk groups. This fragmentation of the average unemployment risk is useful since it allows us to combine the unemployment level (quantity) effect and the share distribution (quality) effect. Based on the estimates, we can determine whether the quantitative or the qualitative effect is more important.[6]

3 Data and Method

Well-being will be approximated by self-reported life satisfaction. The data on life satisfaction and sociodemographic characteristics are taken from the Eurobarometer survey series. They cover the period 1983 to 2002 and refer to the following countries: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, and the UK. The rates of unemployment and inflation (control variable) are taken from the EU's Annual Macroeconomic Database (AMECO), and they are entered in our data as percentages. Unemployment by duration is subdivided into short-term unemployment (up to three months unemployed), medium-term unemployment (more than three months and up to one year unemployed), and long-term unemployment (more than one year unemployed). These data are taken from the OECD online database and are entered in our data as percentages. See table 5 in the Appendix for summary statistics for all variables.

The life satisfaction question reads as follows: "On the whole, are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead." The responses are rated as follows: "very satisfied" = 4, "fairly satisfied" = 3, "not very satisfied" = 2, "not at all satisfied" = 1. Given that not all of the required sociodemographic characteristics are available for each individual in all years for all countries, the regressions refer to 296,707 individuals. However, the distribution of life satisfaction in our sample does not differ significantly from the distribution of the full sample. The mean of life satisfaction (ls) is 3.03 in both samples. Table 1 provides a comparison of the distribution of life satisfaction for both samples.

Given the ordinal character of our dependent variable, we use a weighted ordered probit maximum likelihood estimator with Huber/White robust standard errors and correction for clustering. The latter is necessary since individual and macro data are combined. We use a weighted estimator to accommodate the circumstance that country-years differ with respect to the number of individuals surveyed. That is, estimates are biased towards "big" countries and towards years with larger "return runs". We weight the obser-

[6] More technically, we test whether people consider not just explicitly the level of unemployment, but also the size of the specific duration groups. Well-being is positively correlated with short-term risk (0.05) while it is negatively correlated with long-term risk (-0.11).

vations for each country across time and for each year across the countries, using the number of individuals relative to their respective populations as weights.[7]

We consider life satisfaction regressions of the following basic form:

$$ls_{ict} = \alpha_1 u_{ct} + \alpha_2 p_{ct} + \sum_k \beta_k X_{kict} + \gamma_t + \delta_c + \epsilon_{ict} \tag{8}$$

$$\begin{aligned} ls_{ict} &= \alpha_1 u_{ct} + \phi_1 share_{Sct} + \phi_2 share_{Lct} + \alpha_2 p_{ct} \\ &\quad + \sum_k \beta_k X_{kict} + \gamma_t + \delta_c + \epsilon_{ict} \end{aligned} \tag{9}$$

$$\begin{aligned} ls_{ict} &= \varphi_1 risk_{Sct} + \varphi_2 risk_{Mct} + \varphi_3 risk_{Lct} + \alpha_2 p_{ct} \\ &\quad + \sum_k \beta_k X_{kict} + \gamma_t + \delta_c + \epsilon_{ict} \end{aligned} \tag{10}$$

ls_{ict} is the self-rated life satisfaction of individual i in country c and year t. u_{ct} and p_{ct} are the unemployment rate and the inflation rate by country and year. X_{kict} refers to the k_{th} sociodemographic characteristic of individual i in country c and year t. Finally, γ_t and δ_c represent time and country fixed effects, and ϵ_{ict} is the individual error term. The sociodemographic characteristics are: Income, labor market status, education, age, and marital status.

All three regressions will be extended by interaction effects. The first extension includes interaction effects of the labor market status with the unemployment rate (equation (8)), the duration shares (equation (9)), and the risk variables (equation (10)). In the second extension, we also consider different education levels, gender, and the age group 40 to 64 years old as interaction variables. The binary character of the interaction group dummies allows us to interpret the results as subgroup effects.

With respect to the labor market status, we differentiate between employed, unemployed, at home or retired, and other occupation. The latter comprises self-employed, manager, public servants, and students. Education is subdivided into four groups: low-educated (leaving the education system before the age of 17), medium-educated (leaving the education system before the age of 21), higher-educated (older than 20 years when leaving the education system), and in education (those who have not left the education

[7] The weights (w) are calculated as follows: $w_{ct} = \frac{\sum_t \sum_c N_{ct}}{\sum_t \sum_c P_{ct}} \frac{N_{ct}}{P_{ct}}$. P is the population in country c at time t and N is the number of observations in country c at time t. In order to keep the weights small, we divide each w_{ct} in a second step by its mean. See, for example, Cameron and Trivedi (2005) for a discussion of micro data weights.

system). Furthermore, we consider two age groups: young (defined as 15 to 39 years old) and old (defined as 40 to 64 years old). People younger than 15 years are not included in the data used, and people of retirement age are captured by the labor market status dummy "at home/retired."

The two reference groups are: *employed* in the first extension of the basic regressions, and *employed, low-educated young male* in the second extension. With respect to the subgroup effects, we provide in the following tables the estimated difference to the reference group.[8] The overall effect for the respective subgroup is reference effect plus subgroup effect. We provide z-statistics for the difference to the reference group and for the general effect (reference plus subgroup effect).

4 Results

Table 2 displays the results for the basic model. The first regression of the general specification (8) suggests that the unemployment rate seems to be significantly negatively related to the well-being of all individuals. This result is in accordance with the standard literature on well-being and general unemployment. However, the unemployment rate significantly reduces life satisfaction of only those who are working if we consider the labor market status as subgroups. For the unemployed, the estimated effects are negative but not significant, although the effect is greater in magnitude (-0.018) compared to employed people. Those who are out of the labor market should be less or not at all affected by the unemployment rate. This is a good control group to assess the relevance of our approach. In fact, according to the estimates, the well-being of those who do not supply labor is unaffected by the unemployment rate.

In a qualitative sense, the results do not change in the third equation, but the overall effect for the subgroup "other occupation" is now -0.044. According to the results for the education groups, people that are more educated are less affected by the unemployment rate. It seems that the average education of the subgroup "other occupation" is higher and the parameter in regression (2) consists of a positive education bias. In addition, women are more affected by the unemployment rate, and the effect is significantly different to both the reference group and to zero. The difference between younger and older people in the working age is very small and not significant. It is interesting to note that the effect for the reference groups (regressions (2) and (3)) is not particularly different from the overall result in the basic specification (regression (1)). That is, the estimated effect for the employed, low-educated male within the age range of 16 to 39 years is almost equal to the average effect for the sample used.

[8] Complete results are available upon request.

The results for the specification (9) are provided in table 3. The quantitative (or real average risk) effect of the unemployment rate has almost doubled if we control for the quality of unemployment in terms of duration. Hence, the effect of the unemployment rate on life satisfaction exhibits a considerable positive bias in usual specifications that follows, for the most part, from the omission of the share of long-term unemployed people. According to regression (5) which also contains the labor market status subgroups, the share of short-term unemployed people is significant only for the unemployed. This is not surprising because those who are actually affected by unemployment are more satisfied if the average duration of unemployment decreases. Hence, this is in line with the severity hypothesis. The positive effect of the share of long-term unemployed on life satisfaction is significant for all labor market status subgroups except for "other occupation." This corresponds with both adaption and flow hypothesis.

In regression (6), the duration shares interact with education, gender, and the age dummies in addition to the interactions considered in regression (5). The share of short-term unemployed people has a positive interaction effect on the life satisfaction of the unemployed, higher-educated, and older people in the labor force. Again, this is in line with the severity hypothesis. The positive interaction effect of the share of long-term unemployed people on life satisfaction is significant for almost all subgroups. Hence, the flow hypothesis seems to be quite robust relative to the subgroups considered. Similarly, for specification (9), it appears that the estimated effect for the employed, low-educated male in the age range of 16 to 39 years is almost equal to the average effect for the sample used. Based on the results in table 3, we can conclude that the (combined) U-shape effect of aggregated unemployment duration on life satisfaction exists.

Specification (10), including extensions about the subgroup effects, are provided in table 4. Short-term risk of unemployment is not significantly related to life satisfaction, neither in the basic regression (7) nor in the two subgroup models. The same applies to the long-term risk of unemployment, with the exception of a weak significant positive effect for the higher-educated people. With respect to the duration-specific risk of becoming/remaining unemployed, only the (expected) duration of 4 to 12 months of unemployment reduces the life satisfaction of the employed and unemployed, and of the more educated, female, and older people in the working age population. People who do not supply labor are unaffected by unemployment risk and differ significantly from the reference group. With respect to the unemployed, it seems that at the beginning of unemployment life satisfaction decreases from period to period. After a year, however, this effect decreases. Regarding the employed people, it seems that not only the fear of losing one's job but also the prospect of remaining unemployed for a certain time is of importance. What seems to bother people is thus not just the risk of becoming/remaining unemployed, but more specifically, the risk of

remaining out of work for 4 to 12 months. This finding corresponds with the U-shape effect of combined severity and flow hypotheses.

5 Conclusions

This study examines whether the distribution of aggregate unemployment by duration affects individual well-being. Two hypotheses are provided to explain how the shares of short-term (up to three months) and long-term (more than one year) unemployed people could affect the well-being of the employed and unemployed: The severity hypothesis and the flow hypothesis. Using data from almost 300,000 individuals from 11 EU countries, an ordered probit estimator is used to analyze the impact of the distribution of aggregate unemployment by duration on individual well-being.

We find significant evidence in favor of both the severity and the flow hypothesis. Hence, the fear of losing (or not finding) a job is more detrimental when the alternative is to remain unemployed for a longer time. At a certain point, however, both employed and unemployed people adapt to unemployment at the macro level. A combination of both findings yields a U-shape effect of the distribution of aggregate unemployment by duration on subjective well-being of citizens from 11 European countries. Using an alternative specification that allows for duration-specific risk of becoming/remaining unemployed, we arrive at similar conclusions. According to this model, only the (expected) duration of 4 to 12 months of unemployment reduces well-being significantly among employed and unemployed people. What seems to bother people is thus not simply the risk of becoming/remaining unemployed, but particularly the risk of remaining out of work for 4 to 12 months.

With respect to the unemployment rate, we find significant negative effects on well-being only for those who are working. For the unemployed, the estimated effects are negative but not significant. A further important result is that the quantity effect of the unemployment rate on well-being has doubled if we control for the quality of unemployment in terms of duration. Hence, the effect of the unemployment rate on well-being exhibits a considerable positive bias in usual specifications.

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7 Appendix

Table 1: Distribution of self reported life satisfaction

	complete sample		considered sample	
ls	frequency	percent	frequency	percent
1	20,231	4.43	12,169	4.10
2	65,365	14.31	42,512	14.33
3	253,817	55.57	165,217	55.68
4	117,363	25.69	76,809	25.89
Σ	456,776	100.00	296,707	100.00

Table 2: Results: Basic Model

	Reg (1)		Reg (2)			Reg (3)		
	coef.	z-stats	coef.	z-stats		coef.	z-stats	
		zero		ref.	zero		ref.	zero
unemployment rate	-0.013	(-2.25)	-0.015		(-2.82)	-0.018		(-2.31)
×unemployed			-0.003	(-0.22)	(-1.29)	-0.002	(-0.11)	(-1.19)
×at home/retired			0.008	(1.78)	(-0.88)	0.012	(3.02)	(-0.55)
×other occupation			0.002	(-0.51)	(-3.09)	-0.026	(-3.22)	(-4.84)
×medium education						0.002	(0.42)	(-2.88)
×higher education						0.017	(1.83)	(-0.31)
×in education						0.032	(4.11)	(1.34)
×woman						-0.005	(-2.04)	(-3.09)
×40 to 64 years old						-0.001	(-0.73)	(-2.27)
pseudo R^2	0.1010		0.1011			0.1012		

Notes: Dependent variable: life satisfaction; estimation method: weighted ordered probit; number of observations: 296,707; z-statistics are calculated based on robust and for clustering corrected standard errors; zero means z-statistics different from zero; reference (ref.) means z-statistics different from the reference group; × means interaction with the unemployment rate; all regressions include year and country fixed effects and individual control variables (labor market status, gender, age, income, education, marital status, children); reference group: Reg (2) employed, Reg (3) employed low-educated male in the age group 15 to 39 years.

Table 3: Results: Duration Model

	Reg (4)		Reg (5)			Reg (6)		
	coef.	z-stats	coef.	z-stats		coef.	z-stats	
				ref.	zero		ref.	zero
unemployment rate	-0.026	(-3.10)	-0.026		(-3.08)	-0.025		(-3.07)
short-term share	0.003	(1.24)	0.004		(1.50)	0.004		(1.71)
×unemployed			0.011	(1.56)	(1.87)	0.012	(1.65)	(2.43)
×at home/retired			-0.003	(-1.85)	(0.43)	-0.002	(-1.15)	(0.89)
×other occupation			-0.004	(-1.19)	(-0.12)	-0.005	(-0.69)	(-0.12)
×medium education						-0.003	(-0.96)	(0.44)
×higher education						0.003	(0.69)	(1.98)
×in education						0.001	(0.14)	(0.78)
×woman						-0.001	(-0.81)	(0.89)
×40 to 64 years old						0.001	(0.35)	(1.83)
long-term share	0.008	(3.36)	0.009		(3.69)	0.008		(3.29)
×unemployed			0.005	(0.86)	(2.04)	0.006	(1.00)	(2.43)
×at home/retired			-0.003	(-2.09)	(2.89)	-0.001	(-0.76)	(2.95)
×other occupation			-0.005	(-1.96)	(1.15)	-0.006	(-0.87)	(0.29)
×medium education						0.001	(0.02)	(3.10)
×higher education						0.004	(1.06)	(3.62)
×in education						0.003	(0.48)	(1.86)
×woman						-0.003	(-2.92)	(2.42)
×40 to 64 years old						-0.001	(-0.79)	(3.29)
pseudo R^2	0.1013		0.1014			0.1015		

Notes: Dependent variable: life satisfaction; estimation method: weighted ordered probit; number of observations: 296,707; z-statistics are calculated based on robust and for clustering corrected standard errors; zero means z-statistics different from zero; reference (ref.) means z-statistics different from the reference group; × means interaction with the shares; all regressions include year and country fixed effects and individual control variables (labor market status, gender, age, income, education, marital status, children); reference group: Reg (5) employed, Reg (6) employed low-educated male in the age group 15 to 39 years.

Table 4: Results: Risk Model

	Reg (7)		Reg (8)			Reg (9)		
	coef.	z-stats	coef.	z-stats		coef.	z-stats	
				ref.	zero		ref.	zero
short-term risk	-0.014	(-0.34)	-0.026		(-0.63)	-0.033		(-0.72)
×unemployed			0.118	(2.09)	(1.26)	0.125	(2.21)	(1.23)
×at home/retired			0.009	(0.79)	(-0.44)	0.017	(0.89)	(-0.54)
×other occupation			0.003	(0.11)	(-0.48)	-0.017	(-0.40)	(-0.80)
×medium education						-0.038	(-1.39)	(-1.50)
×higher education						0.036	(0.90)	(0.07)
×in education						0.032	(0.63)	(-0.02)
×woman						0.002	(0.13)	(-0.64)
×40 to 64 years old						0.016	(0.68)	(-0.46)
medium-term risk	-0.061	(-2.17)	-0.074		(-2.60)	-0.076		(-2.30)
×unemployed			-0.070	(-1.40)	(-3.04)	-0.075	(-1.45)	(-3.55)
×at home/retired			0.048	(3.65)	(-0.84)	0.043	(2.25)	(-0.93)
×other occupation			0.036	(1.29)	(-1.00)	-0.012	(-0.16)	(-0.97)
×medium education						0.011	(0.60)	(-1.82)
×higher education						-0.002	(-0.07)	(-2.39)
×in education						0.045	(0.62)	(-0.49)
×woman						0.016	(1.05)	(-1.74)
×40 to 64 years old						-0.012	(-0.85)	(-2.90)
long-term risk	0.009	(0.59)	0.012		(0.76)	0.009		(0.40)
×unemployed			0.006	(0.25)	(0.59)	0.010	(0.40)	(0.56)
×at home/retired			-0.008	(-1.22)	(0.30)	0.001	(0.26)	(0.52)
×other occupation			-0.018	(-2.23)	(-0.33)	-0.031	(-1.27)	(-0.60)
×medium education						0.004	(0.39)	(0.68)
×higher education						0.023	(1.32)	(1.80)
×in education						0.026	(1.00)	(1.44)
×woman						-0.015	(-2.74)	(-0.29)
×40 to 64 years old						0.001	(0.11)	(0.47)
pseudo R^2	0.1012		0.1014			0.1016		

Notes: Dependent variable: life satisfaction; estimation method: weighted ordered probit; number of observations: 296,707; z-statistics are calculated based on robust and for clustering corrected standard errors; zero means z-statistics different from zero; reference (ref.) means z-statistics different from the reference group; × means interaction with the risks; all regressions include year and country fixed effects and individual control variables (labor market status, gender, age, income, education, marital status); reference group: Reg (8) employed, Reg (9) employed low-educated male in the age group 15 to 39 years.

Table 5: Summary Statistics

Variable	mean	std. dev.	min	max
life satisfaction	3.034	0.752	1	4
unemployment rate	8.459	3.202	2.5	19.8
inflation rate	4.352	3.263	-0.699	19.453
share of short-term	17.987	8.230	3.7	45.3
share of long-term	46.973	12.745	19.7	76.2
short-term risk	1.417	0.619	0.329	3.322
medium-term risk	2.874	1.004	1.070	6.379
long-term risk	4.168	2.292	0.721	11.128
unemployed	0.063	0.243	0	1
at home/retired	0.195	0.396	0	1
other occupation	0.075	0.263	0	1
female	0.511	0.500	0	1
age	44.056	17.670	15	99
income	6.734	3.399	1	12
education 16 -19 years	0.359	0.480	0	1
education $\geq$ 20 years	0.205	0.404	0	1
still in education	0.072	0.259	0	1
married	0.587	0.492	0	1
divorced	0.039	0.194	0	1
widowed	0.085	0.279	0	1
living together	0.052	0.222	0	1
separated	0.013	0.114	0	1

Number of observation: 296,707