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Happiness of Economists

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CESIFO WORKING PAPER NO. 5099
CATEGORY 13: BEHAVIOURAL ECONOMICS
DECEMBER 2014

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Happiness of Economists

Abstract

We study the importance of economists' professional situation toward their life satisfaction based on a unique survey of mostly academic economists. On average, economists report to be highly happy with life. Satisfaction is positively related to spending more time on doing research. The lack of a tenured position decreases satisfaction. However, the extent to which the uncertainty created by the tenure system affects satisfaction varies with the contract terms. The effect is stronger if the contract expires in the near future or cannot be extended. Publication success has no effect if it is controlled for academic rank and the contract duration. The finding suggests that publications are rather a means to an end, e.g., to acquire a tenured position. While the perceived level of external pressure also has no impact, the perceived change of pressure in recent years is positively related to economists' life satisfaction. An explanation is that economists have accepted a high level of pressure when entering academia but are not willing to cope with the recent increase.

JEL-Code: I310, A110, J280.

Keywords: happiness, academic labor market, extrinsic and intrinsic motivation, publish or perish.

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The authors are indebted to the European Economic Association, the German Economic Association, the French Economic Association, and the Applied Microeconomic congress who allowed us to use their members' email addresses. The authors are grateful to Yvon Rocaboy for organizing the survey among French economists. The authors benefited from comments by Axel Dreher, Jürgen Hoffmeyer-Zlotnik, Lars Kaczmirek, Dominic Leiner, Natalja Menold, Andrew Oswald, participants of the European Public Choice Meeting 2013, the Beyond Basic Questions Workshop 2013, and the Meeting of the European Economic Association 2014.

1 Introduction

Working in academia differs from conventional employment. An academic career provides few pecuniary advantages. Salary is relatively low and occupational uncertainty may be higher than elsewhere. An important extrinsic motivation is to be the first to make a discovery and therefore obtain recognition from one's peers (Merton 1957). A considerable part of the reward of doing research is assumed to derive from puzzle-solving (e.g., Kuhn 1962; Stephan 2012). Researchers also benefit from high autonomy. However, the winner-take-all nature of scientific contests puts strong pressure on researchers. A career in academia depends on a researcher's success in discovering new phenomena and publishing the results in established journals.

The consequences of the constraints and incentives governing researchers' choices have long been debated (Stephan 2012). Economists have shown an increasing interest in studying their own behavior (Kirchgaessner 2005). At the same time, they have devoted much effort in understanding the determinants of happiness (Dolan et al. 2008). However, happiness research focuses on the well-being of the general population (Frey and Stutzer 2001). To the authors' knowledge, so far no study examines how economists' professional situation is related to their life satisfaction. Studies of occupational groups often deal with job satisfaction (e.g., Benz and Frey 2008; Steiner and Schneider 2013). However, according to the "work preference" theory by Throsby (1994), happiness at work should imply more than job satisfaction for researchers. In this study, we analyze the importance of economists' professional situation toward their well-being. The examination is based on an online survey of professional, mostly academic economists from mainly European countries.

The empirical analysis shows that certain features of the occupational situation are indeed related to economists' life satisfaction. In line with expectations, having more research time is found to be positively related to well-being. Compared to those that spend less than 25% of their time on research, the probability to be "highly

satisfied” is 14 percentage points (ppts) higher among economists that report that they spend more than 50% of their time on research.

Having a non-permanent position is negatively related to economists’ life satisfaction. However, distinguishing by contract terms reveals that a statistically significant relationship is only found for those whose contract expires in the near future or cannot be extended. The result is in line with research on the general labor market. Our study is the first indicating that in academic employment - in which occupational uncertainty is usually higher than in employment in a typical corporation (e.g., McPherson and Winston 1983) - the relationship between fixed-term contracts and life satisfaction varies with the contract terms.

Recognition obtained by publishing one’s work does not seem to be an end in itself. A significant link between publication success and life satisfaction is only found when it is not controlled for the general work conditions, e.g., whether the respondent has a tenured position. While the perceived level of pressure is unrelated to life satisfaction, the perceived change of pressure in recent years is associated. An explanation for the results is that economists have accepted a high level of pressure when entering academia but do not seem to be able or willing to cope with the increase in recent years. Our results are in line with the literature criticizing the “set point theory” of subjective well-being. The theory postulates that people quickly adjust to new life circumstances (Diener et al. 2006).

We study a specific subset of social scientists. Our analysis does not allow a direct assessment of whether the results also apply to researchers from other disciplines. However, the results of previous analyses of academics’ job satisfaction (Ward and Sloane 2000; Bender and Heywood 2006) point to similar conclusions. We believe that the results should extend to apply to researchers from related disciplines.

2 Previous literature and hypotheses

The economic approach to human behavior focuses on extrinsic motivation. Income, recognition, reputation or winning in a competition are assumed to increase utility (e.g., Becker 1976). However, it has been well established that people do not work merely for the money (e.g., Frey 1997). This should apply in particular to occupational groups with a “work preference,” such as researchers. They are assumed to derive satisfaction, rather than dissatisfaction, from the process of work itself (Throsby 1994). Researchers are assumed to be motivated by three factors: money, recognition by peers, and the ability to solve puzzles (Stephan 2012).

The reward system in science assigns a limited role to monetary compensation. Academia is characterized by a rigid salary system in which pay is relatively low (Stephan 2012). Researchers seem to tolerate the relatively flat shape of the earnings profile. Economists rate salary as only the fourth most important factor when choosing a job (Inomics 2012). Analyzing job offers, Stern (2004) finds that researchers indeed forego monetary compensation for working in a job related to research. Roach and Sauermann (2010) find that PhD scientists concerned with salary are more likely to sort into industry than into academia. While Ward and Sloane (2000) find no link between researchers’ income and their job satisfaction, the results by Bender and Heywood (2006) indicate a positive relationship. Although scientists are certainly not immune to monetary rewards, this does not seem to be their central motivation.

In the winner-take-all market of academia, an important extrinsic reward is to be the first to make a discovery and therefore obtain recognition from one’s peers (Merton 1957). As pointed out by Dasgupta and David (1994), acknowledgment by colleagues is the “fundamental ‘currency’ in the reward structure.” Edelman and Larkin (2009) show that researchers “game” the Social Science Research Network to gain the status of being author of a top 10-downloaded paper.

However, recognition is not only an end in itself. Publications are crucial for

an academic career (Graber and Wälde 2008). In Europe, historically performance had virtually no effect on salary and position (Frey and Eichenberger 1993). However, several countries recently introduced cash bonuses for published articles in an attempt to increase researchers' output (Franzoni et al. 2011).

Therefore, for multiple reasons, a better publication record should increase life satisfaction. One may also argue that a higher level of life satisfaction increases productivity (Boehm and Lyubomirsky 2008). The literature studying this link is ambiguous. However, empirical evidence attributes a strong chance element to successful publication (Cole et al. 1981; Neff and Olden 2006; Osterloh and Frey 2011). Following this reasoning, the presumed causality goes from publication success to life satisfaction, and not in the reverse direction. Our first hypothesis is that

Hypothesis 1: Economists' life satisfaction is positively related to their publication record.

A considerable part of the reward of doing research is assumed to derive from puzzle-solving (Stephan 2012). As stated by Kuhn (1962, p. 36) "Bringing a normal research problem to a conclusion is achieving the anticipated in a new way, and it requires the solution of all sorts of complex instrumental, conceptual, and mathematical puzzles. The man who succeeds proves himself an expert puzzle-solver, and the challenge of the puzzle is an important part of what usually drives him on."

Time to conduct own research is rated the most important factor for economists when choosing a job (Inomics 2012). Roach and Sauermann (2010) show that PhDs sort into sectors by their "taste for science." PhDs in science and engineering fields that, e.g., assign higher importance to the freedom to choose projects prefer to work in academia over a career in industry. Bender and Heywood (2006) show that job satisfaction of US PhD graduates is increased by a close relation between job and degree (closeness assessed by respondents). They find that scientists who state that doing research is their primary activity at work report a higher job satisfaction as compared to those whose main activity is managing or computer work. No difference

is found with respect to those whose primary activity is teaching. We expect that

Hypothesis 2: Economists' life satisfaction is positively related to the share of time spent on doing research.

However, the reward system in science creates high pressure to be successful. Miller et al. (2011) find that subjective publication pressure is negatively related to the satisfaction derived from publishing. At the same time, perceived pressure is found to be positively correlated to a feeling of stress related to publishing and “publication burnout”, i.e., feeling exhausted or thinking about leaving academia. If researchers get the impression that all that matters is publishing in a top-journal independent of the article’s content, their life satisfaction may also suffer.

Hypothesis 3: Economists' life satisfaction is negatively related to the perceived external pressure.

A central feature of academic employment is the institution of tenure. An academic career involves an intensive initial screening process, or as McPherson and Winston (1983) put it “an explicit and risky probation that precedes obtaining the guarantee.” The institution of tenure is defended by its ability to select the most able researchers. However, a striking feature of academic employment is the large number of researchers that have to expect not to be allowed to stay. Evidence suggests that scientists without tenure report significantly lower job satisfaction (Bender and Heywood 2006; Bozeman and Gaughan 2011). Tenure also seems to play a critical role for the job satisfaction of academics relative to non-academics. Only academics with tenure (but not those with a limited contract) report substantially higher job satisfaction than non-academics (Bender and Heywood 2006).

Hypothesis 4: Economists' life satisfaction is negatively related to occupational uncertainty (not having a tenured position).

3 Empirical analysis

3.1 Survey

The information has been gathered in an online survey. The questionnaire contained questions on economists' research norms, research behavior, perceptions of the research environment, socio-demographics, and satisfaction with life. The European Economic Association, the German Economic Association (Verein für Socialpolitik), the French Economic Association (Association Française de Science Economique) and the Applied Microeconomic Congress (Journées de Microéconomie Appliquée) kindly allowed us to use their mailing lists. Participants were invited by email.

The invitation included a non-personalized link to the questionnaire which was accessible for eight weeks. A reminder was sent after four weeks. The survey was conducted in three waves which took place in fall 2010, winter 2010, and summer 2011. The analysis is based on information from all three survey waves. A detailed description of the survey's methodology and content can be found in Necker (2014).

The questionnaire was started 1,735 times, 1,046 respondents continued until the last page.¹ The response rate was 17% in the first survey round (EEA members, counting respondents that continued until the last page) and 11% in the second and third rounds. The survey focused on scientific misbehavior, i.e., a highly sensitive topic. We study whether the topic influenced the willingness to participate. Our examination shows that the sample is representative of the population.²

The information required for the analysis is available for 934 participants. The second and third survey waves contained a randomization procedure which skipped the section on the respondent's behavior for one sixth of the respondents (to check whether inquiring own behavior influenced other responses). Since responses from

¹ Additional 54 who indicated that they already participated were forwarded to the last page.

² Details of the analysis of representativeness of the first two waves are provided in Necker (2012, 2014) (characteristics of the population of the third wave are not available). Various tests, e.g., a comparison of sample and population statistics, a comparison of dropouts and those finishing the survey, indicate that the responses are not subject to unit non-response biases.

this section (perceived pressure) are used, 112 observations have to be discarded.

Individuals from all parts of the world participated in the survey. Summary statistics of the citizenship and other characteristics are shown in table 1. While participants of the first survey of EEA members are representative of European economists (organized in the EEA), it has to be taken into account that the other two invitations were sent out by national organizations of economists. This is the reason why German and French economists form a large majority of the total sample (66% with respect to citizenship or 60% with respect to the workplace location).

Although item non-response rates are rather low, deleting observations with missing values results in an up to 14% smaller sample available for the empirical analysis. Complete-case analysis has been found to be an acceptable approach if the fraction of incomplete cases is below 5% (Schafer 1997). The missing values are filled in by an iterative multiple imputation (MI) procedure. Five complete data sets were created. The details of the imputation are available upon request.

3.2 Economists' life satisfaction - question and descriptive statistics

Studies of occupational groups often deal with job satisfaction (e.g., Benz and Frey 2008; Steiner and Schneider 2013). However, Fisher (2010) points out that “happiness at work is far more than job satisfaction.” As discussed in section 2, this should be particularly true for researchers. To capture all dimensions of happiness related to researchers' work, the questionnaire included the question “Generally speaking, how satisfied are you with the life you lead?” Participants were asked to indicate their response on a scale ranging from 1 “highly unsatisfied” to 6 “highly satisfied.” The question corresponds to those employed in large scale surveys, e.g., the Eurobarometer (4-point scale) or the European Value Survey (10-point scale).³

Figure 1 shows the distribution of responses. Economists report on average a high level of life satisfaction. The mean response is 4.6 with a standard deviation of

³ The number of response possibilities provided in the different large scale surveys ranges from three to eleven (Dolan et al. 2008).

1.2.⁴ Unfortunately, a direct comparison to other groups is impossible.

Suggestive evidence can be gathered by comparing summary statistics from our survey to those from other surveys. The European Value Survey (EVS) provides information on life satisfaction in Europe (“All things considered, how satisfied are you with your life as a whole these days?” 1 “dissatisfied” - 10 “satisfied”). The mean response in 2008 (the most recent wave) is 6.9, the standard deviation is 2.3. The distribution is shown in figure A.1 in the appendix. The coefficient of variation suggests a higher dispersion of responses in the EVS (33.3 in EVS vs. 25.5 in our sample). This is unsurprising. The general population is much more heterogeneous than the sample of economists who have, e.g., similar education. The skewness is - 0.75 in the EVS and -1.0 in our sample, indicating a slightly lower happiness in the general population than among the economists surveyed in our sample. Overall, economists’ life satisfaction seems to be similar to that of the general population.

3.3 Empirical approach

Economists’ life satisfaction is a latent variable, y_i^* , measured by the ordinal variable y_i which takes on values from 1 “highly unsatisfied” to 6 “highly satisfied.” The ordinal variable is the dependent variable. The structural model is given by

$$y_i^* = \beta_0 + \beta_1 \text{Publications}_i + \beta_2 \text{Research Time}_i + \beta_3 \text{Perceived Pressure}_i + \beta_4 \text{Tenure}_i + \beta_5 X_i + \epsilon_i \quad (1)$$

We test the first hypothesis using respondents’ self-reported publication record in the past three years (0, 1, 2, 3-4, 5-7, more than 8). The quality of the publications is captured by binary variable which is set to unity if a respondent reports that he or she published in the American Economic Review, Quarterly Journal of Economics,

⁴ The means of life satisfaction in the different waves are 4.6 (EEA), 4.7 (German economic association), 4.5 (French economic associations). The difference between the latter two is significant.

Journal of Political Economy, Econometrica, or Review of Economic Studies in the past three years. The second hypothesis is tested using respondents' proportion of time spent on doing research (less than 25%, 25-49%, 50-75% or more than 75%). Economists were asked whether they perceive publication pressure at all and, in case of an affirmative answer, to report the intensity on a scale from 1 ("very low") to 6 ("very high"). Due to a low frequency of responses, individuals who perceive no or low pressure are grouped. To study the impact of occupational uncertainty, we use the information whether the individual reports to have a non-tenured position.

Previous studies show that happiness varies with socio-demographic characteristics. The happiness distribution conditional on age is found to correspond to a U-curve. While women tend to report higher life and job satisfaction (Frey and Stutzer 2001; Dolan et al. 2008), Ward and Sloane (2000) find that job satisfaction of academics does not differ by gender. We include a dummy for gender and dummies for the age/cohort. We control for the academic rank and the type of employer. Dummies for the country/region of origin capture differences in culture.⁵ Wave dummies capture the effect of different timing of the surveys.

Ordinal and nominal controls are included as a set of dummies. The reference group is the highest or lowest category in case of ordered alternatives, among these the more frequent category is chosen. The reference group of unordered alternatives is the mode. Summary statistics of all variables can be found in table 1.

The survey does not provide information on some variables frequently considered in happiness research. However, the homogeneity of the sample obviates the need to control for several variables, e.g., education or unemployment (as also argued by Ward and Sloane 2000). As pointed out in section 2, monetary compensation is expected to be less important to researchers. We assume that the omission of variables such as family status, social contacts, or income does not bias our results.

⁵ It is controlled for the respondent's country of origin if more than 20 observations are available. Otherwise countries are grouped by geographical proximity.

The model parameters are obtained from an ordered probit regression.⁶ The five multiply imputed complete data sets are used separately for the analysis. Reported are averages of the five estimates, the results are combined using Rubin’s rule.^{7,8} The determinants cannot be said to be truly exogenous. We refrain from non-sustainable claims about the direction of causality.

3.4 Baseline results

We first include each (set of) variable(s) used for testing the four hypotheses individually. Second, we jointly include the variables. Table 2 shows the coefficients from the ordered probit regressions. Table 3 reports average marginal effects on the probability that a respondent reports being “highly satisfied” with life.

The evidence suggests that economists’ publication success is largely unrelated to their life satisfaction. Compared to respondents without a refereed publication, respondents with any positive publication record do not have a higher probability to be “highly satisfied.” The quality of a respondent’s publications, i.e., a publication in one of the top-journals of the discipline, also does not appear to matter. The marginal effects are statistically insignificant regardless of whether the other variables of interest are excluded (model (1)) or included (model (5)). Including the reported number of publications as an ordinal variable instead of as a set of dummies yields a similar result. Table 4 shows that the marginal effect of the ordinal variable is positive. However, the effect is small and only significant at the 10% level.

In contrast, the fraction of time spent on doing research is significantly positively related to economists’ life satisfaction, as shown in columns (2) and (5) of table

⁶ Much of the happiness literature treats the dependent variable as cardinal and uses ordinary least squares (OLS) regression analysis (Frey and Stutzer 2001; Ferrer-i Carbonell and Frijters 2004). The results are unchanged when the model is estimated using OLS.

⁷ The MI estimate of β , the vector of parameters of interest, is $\bar{\beta}_M = \frac{1}{5} \sum_{i=1}^5 \hat{\beta}_i$. The variance-covariance matrix of $\bar{\beta}_M$ is $T = \bar{U} + (1 + \frac{1}{5})B$ where $\bar{U} = \sum_{i=1}^5 \frac{\hat{U}_i}{5}$ is the within-imputation variance-covariance matrix and $B = \sum_{i=1}^5 \frac{(\hat{\beta}_i - \bar{\beta}_M)(\hat{\beta}_i - \bar{\beta}_M)'}{5-1}$ is the between-imputation variance-covariance matrix.

⁸ Results are largely unchanged if a complete case analysis is performed (available upon request).

3. The relation is not as strong for those reporting 25-50% of time available for research. Their probability of being “highly satisfied” is 4.2ppts higher (significant at the 10% level) in comparison to those reporting less than 25% of time. However, researchers that have more than 50% research time report substantially higher life satisfaction. The probability that respondents that can use 50-75% report to be “highly satisfied” is 14ppts higher as compared to researchers with less than 25% of research time (significant at the 1% level). Having even more research time, i.e., more than 75% of one’s time, implies a similar increase in happiness.

The results reported in columns (3) and (5) of table 3 provide little evidence that the level of perceived publication pressure is related to life satisfaction. Though a negative relationship is suggested, none of the effects is statistically significant at conventional levels. If we include the information on the level of publication pressure as an ordinal variable, the marginal effect is -2ppts (significant at the 10% level, see table 4). The evidence for a significantly negative effect of pressure is thus limited.

In contrast, occupational uncertainty seems to matter for economists’ well-being. Individuals without a tenured position are 6.6ppts less likely to report that they are “highly satisfied,” the effect is significant at the 5% level in model (5).

One concern regarding these results is that some of the control variables contain similar information. Table A.1 shows that academic rank is highly correlated with tenure and publication success. The results, reported in the lower panel of table 4, indicate that the relationship between tenure and life satisfaction is stronger if the academic rank is not taken into account. The effect is 8ppts; it is significant at the 1% level. Furthermore, the results from model (1) in the lower panel of table 4 suggest a significantly positive link between publication success and life satisfaction. For example, having published eight or more articles in the past three years increases the probability of reporting high life satisfaction by 10ppts. If the other controls are added (model (5)), the effect of publication success turns again insignificant.

It is possible that the ambition to achieve certain professional outcomes differs

across researchers' positions. This may blur the effects of certain variables. We study whether the results are different when we focus on specific subsets of our sample. First, we drop PhD students. It is possible that at this early stage of the career, some achievements, e.g., publication success, are not perceived as a possibility. However, the results based on the remaining sample are unchanged (available upon request).

Second, we check whether the motivation of tenured economists differs. The aim to achieve high recognition and autonomy may be more important to tenured economists who do not anymore have to worry about job stability. We estimate the regressions including only tenured economists (58% of the sample). The results, reported in table A.2, suggest slight differences in the motivation of tenured economists. A very good publication record (8 or more publications/publication in an A-journal) has a positive effect on life satisfaction (significant at the 10% level). A higher link between research time and life satisfaction is indicated.

Interesting results with regard to economists' socio-demographic features are the following. Life satisfaction does not differ by gender which is also found by Ward and Sloane (2000) with regard to job satisfaction. The marginal effects suggest that economists born between 1950 and 1970 (i.e., 30 to 60 years old) are less satisfied with life than the youngest and oldest age group/cohort. This is the same pattern usually established in studies of the general population's happiness. However, the differences between age groups/cohorts are also insignificant.

We find significant differences between respondents with different academic ranks. Economics professors are significantly more happy than every other economist working in academia. PhD students are 11ppts, full time researchers 9ppts, and assistant professors 7ppts less likely to be "highly satisfied" with life. A professorship may provide several amenities beyond tenure, e.g., better pay, high reputation, and responsibility. However, compared to those without an academic position ("other position") no significant difference is found (according to model (5)).

The results on economists' citizenship are reported graphically in figure 2. The

results line up with the established cross-country pattern of happiness. Compared to German economists, researchers from Italy, France, and Eastern European countries have a significantly lower probability to report being “highly satisfied” with their lives (significant at least at the 5% level). A similar effect is observed for economists from Spain, Portugal, and Austria (significant at most at the 10% level). Researchers from Switzerland, North America and Scandinavian countries tend to be most happy. It should be noted that several effects are based on few observations. A fraction of 20% does not work in the country of their citizenship. However, a largely similar pattern is obtained when we control for the location of the respondent’s workplace instead of citizenship (results shown in figure A.2 in the appendix).

A possible concern is that we are unable to control for several variables which have been shown to be related to well-being. For example, one may argue that some effects are influenced by the omission of respondents’ income. Altbach et al. (2012) provide information on average academic salaries for selected countries and positions. The information is available for one fourth of the sample. Including the variable in the baseline model shows that average salary in the respondent’s country and position is unrelated to his or her life satisfaction. Including average salary does not change the results on other variables.⁹ While the result does not reveal whether individual salary is related to life satisfaction, it is in line with expectations.

Another approach to capture some of the missing information regarding respondents’ habits and life balance is to include the time of the day when the survey was completed. Including a set of dummies which captures whether the survey was completed in the morning, afternoon, evening, or night (6 hour intervals) shows that the results described above are unchanged (available upon request).

⁹ We assign average salaries reported for full, associate, and assistant professors from France, Germany, Italy, Netherlands, UK, and US to respondents with the respective characteristics. Results available upon request.

3.5 Scrutinizing the effect of perceived pressure

Our results suggest that academic economists have integrated pressure as a normal part of their professional life. However, in recent years the pressure to publish has become even more intense (e.g., Graber and Wälde 2008). The perception that pressure increased beyond the level accepted when entering academia may decrease life satisfaction. The “setpoint theory” of subjective well-being postulates that an individual’s happiness tends to a setpoint level established by personality and genetic heritage. Positive and negative life events can shift happiness above or below this setpoint. Hedonic adaptation has usually been assumed to quickly re-establish the equilibrium level. However, recent literature suggests that experiences may have long-run-effects (e.g., Easterlin 2006; Diener et al. 2006).

We analyze whether the perceived change of pressure is related to economists’ well-being. Respondents that stated that they perceive publication pressure were asked to assess how the pressure changed over the last decade. We replace the level of pressure with a set of dummies capturing the perceived change in the regression.

The marginal effects are reported in table 5. The reference group is respondents that perceive a “strong increase” of publication pressure. The probability to be “highly satisfied” is 7ppts higher among those who perceive that the pressure has only “increased” (significant at 1% level). The probability is even higher for those for whom publication pressure has only “slightly increased”; the difference is 11ppts (significant at the 5% level). Those who perceive that the pressure is unchanged or even report a decrease of pressure have a 7ppts higher probability; however, the effect is not statistically significant at conventional levels. The results are unchanged when the level and pressure are included simultaneously (available upon request).

We check whether the same effect can be established for the pressure to raise external funds. The regression includes, first, the perceived level and, second, the change of this type of pressure instead of the pressure to publish. As shown in column (2) of table 5, the level of pressure to raise external funds does not have

a significant effect on life satisfaction, either. However, column (3) shows that the perception of a stronger increase in the pressure to raise external funds is negatively related to the probability to be “highly satisfied.” The effects range from 6-11ppts, as observed with respect to publication pressure. A lower perceived change of the pressure to raise public funds increases the probability to be “highly satisfied” to a larger extent. Thus considering another type of pressure does not change the results.

Motivation crowding theory argues that external interventions that are perceived to be controlling crowd out intrinsic motivation (e.g., Frey 1997). It is possible that the perception of a high level of pressure does not influence life satisfaction directly but operates by crowding out the positive effects of being a researcher. Individuals that feel pressured to be productive may derive lower utility from their autonomy.

We study this question by including interactions of the dummies measuring the level of subjective publication pressure with those measuring research time in the full model shown in column (5) in table 2. Ai and Norton (2003) point out that the coefficient on the interaction term and the marginal effect of a change in the interaction term are meaningless. Greene (2008) and Berry et al. (2010) suggest that graphical presentations of the results can be more informative than numerical results. We follow their suggestion to rely on graphical presentations of the results.

Figure 3 plots the marginal effects of research time on the probability to be “highly satisfied” as a function of the level of perceived publication pressure, all other variables are held at their mean. Only few individuals perceive no or low publication pressure as reflected in the large confidence intervals. We focus on the results for individuals perceiving at least “moderately high” publication pressure. The figure shows the already established pattern that having more research time is positively related to life satisfaction. The positive effects of having more than 25% of one’s time for research tends to be higher among respondents that perceive only a moderate level of pressure compared to respondents who perceive high or very high pressure. Thus a crowding out effect is weakly suggested by the marginal effects.

3.6 Scrutinizing the effect of tenure

Several studies that analyze the relationship between job insecurity and job satisfaction in the general labor market find that limited-contract workers are not under all conditions less satisfied than permanent workers. The relationship seems to depend on the features of the temporary contract. For instance, Ahn and García (2004) find that job satisfaction decreases with the length of the remaining contract. Origo and Pagani (2009) point out that what matters for workers' well-being is the perceived security of their job rather than the protection guaranteed by the contract. Workers with a temporary contract who perceive that their job is secure do not report a lower level of job satisfaction than workers with a permanent contract.

We study whether the relationship of not having academic tenure and life satisfaction differs by contract terms. Respondents of our survey provided information on the remaining duration of their current contract. We replace the binary variable capturing whether the respondent has tenure by a set of dummies indicating whether the contract expires within one year, two years, or three or more years.¹⁰

Marginal effects from that regression are shown in column (1) of table 6. The remaining duration of the contract is clearly positively related to life satisfaction. Compared to respondents with a tenured position, respondents who face expiration of their contract within the next year are 9ppts less likely to report that their life satisfaction is “very high” (significant at the 1% level). Economists whose contracts expire within two years are 6ppts less likely to report this level of life satisfaction. The probability that a respondent reports to be “highly satisfied” is 4ppts lower if his contract expires within three or more years. The latter two effects are statistically insignificant at conventional levels. The results are very similar when information on the academic rank is excluded from the model.¹¹ The results are consistent with

¹⁰ As shown in table 1, 18.6% report that their contract expires within the next year, 11.5% within two years, 11.5% within three or more years.

¹¹ While immediate expiration implies a decrease of 11ppts (sign. at 1% level), expiration in two years a decrease of 8ppts (sign. at 5% level), expiration in three years a decrease of 5ppts (insignificant). Results available upon request.

the notion that a non-tenured position causes less worries when the individual does not face expiration of the employment contract in the near future.

Similarly, the possibility that the contract can be extended may imply a lower negative effect of not having tenure. Respondents were asked whether their contract is renewable.¹² We replace the variable capturing a non-tenured position by two binary variables indicating whether or not the contract can be extended. The results are shown in column (2) of table 6. Compared to respondents that have a tenured position, a statistically significant difference can only be found for those whose contract cannot be extended. These respondents are 6.4ppts less likely to report being “highly satisfied.” The effect is 5.9ppts and insignificant for respondents without this possibility. Hence only contracts that imply immediate uncertainty about the occupational future seem to matter for economists’ satisfaction.

4 Discussion

The results are largely in line with our hypotheses. However, we also obtain findings which contradict our expectations. For example, the results indicate that publication success is unrelated to life satisfaction. One explanation is that publishing one’s work is not an end in itself. The finding that publication success is positively related to life satisfaction if academic rank and contract duration are not controlled for indicates that publications are rather a means to an end, e.g., to acquire a tenured position. However, it is also possible that our variable imperfectly captures the benefits of publication. Publications per se may not increase life satisfaction. The credit received due to publication, e.g., high reputation or a large number of citations, may be of importance. It should be noted that the results are only informative about recent publication success. Furthermore, publication success may be subjective. While we find limited evidence for differences of the effect across

¹² Of those with a limited contract, 27.4% report that the contract can, 59.3% that it cannot be extended, 13.3% report that the question “does not apply”. Since we do not know the reasons for reporting inapplicability, the respective observations are dropped from the analysis.

academic positions, it is possible that the researcher's previous success determines whether additional publications make him or her happy.

The large positive relationship between research time and life satisfaction is remarkable. It has to be considered that to some extent the proportion of time spent on doing research is the researcher's choice. Previous literature shows that researchers sort into positions according to their taste for science. Our results can thus be interpreted as the association between having chosen a certain amount of research and life satisfaction. The finding that more than 75% of time for research does not further increase satisfaction suggests that researchers also enjoy other tasks, e.g., sharing their insights with students. Bender and Heywood (2006) find that job satisfaction derived from teaching does not differ from the one derived from research.

Economists' happiness differs neither by gender nor by age. Reviewing previous literature, Dolan et al. (2008) conclude that when a narrowly defined subgroup of the population is studied, life satisfaction does not differ by gender. Our study indicates that not only gender but also age may capture omitted variables.

Previous literature shows that health, education, family status, and other factors related to personal life matter substantially for well-being (e.g., Dolan et al. 2008). Our survey did not collect information on these factors. We argue that economists are a homogeneous sample which obviates the need to control for several variables, e.g., education. Controlling for average salary does not change the results. We cannot study whether controlling for individual salary also has no effect. Individual salary in academia depends on age, academic position, country of workplace, and to some extent publication success. It is possible that the effect of these variables to some extent captures the effect of salary. It should be noted that international comparisons of salaries are difficult. A large scale study of the careers of researchers from various countries shows that, apart from differences in taxation, salaries cover different components in different countries, e.g., regarding social security insurance (MORE2 project by the European Commission, IDEA Consult 2013).

Recent government reforms implemented in many countries aim at increasing output by introducing a premium on published articles (e.g., Franzoni et al. 2011). The finding that publication success is unrelated to economists' life satisfaction raises the question how successful those incentives are. Other authors discussing incentives to increase researchers' output also question the effectiveness of pay-for-performance programs. Hamermesh and Pfann (2011) recommend that university administrators should pay less for the quantity of publications but rather spend on resources that enhance the researchers' and institution's reputation. Frey and Neckermann (2009) emphasize the role of awards as an incentive instrument. Our results suggest that incentives in terms of more research time may be appreciated by researchers.

5 Conclusion

Considering researchers' satisfaction with life, economics does not seem to be a dismal science as has been claimed. In line with the conjecture that researchers are motivated by a desire to "solve puzzles", we find that economists' happiness is positively related to spending more time on doing research. A tenured position is not only positively associated with job satisfaction as found in the previous literature; the positive effect seems to extend to life satisfaction. Highly interesting is the result obtained when distinguishing the terms of economists' contracts. Accordingly, a significantly negative relationship can be observed in particular for those who face imminent or final expiration of the contract. Our study is the first providing evidence for those differences with respect to academic employment. While economists seem to take a high level of pressure as a normal feature of their occupation, the increase of pressure over the past years is found to be negatively related to their life satisfaction.

References

Ahn, N. and J. R. García (2004). Job Satisfaction in Europe. Documento de Trabajo 16.

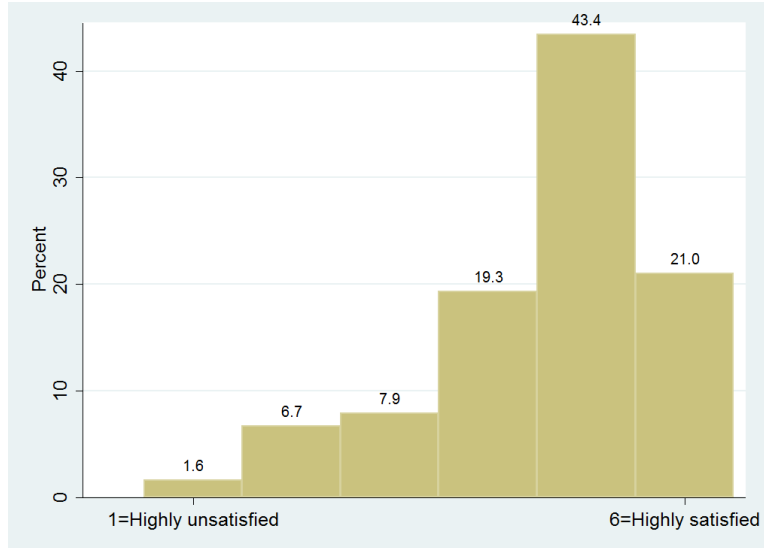
- Ai, C. and E. Norton (2003). Interaction Terms in Logit and Probit Models. *Economics Letters* 80, 123–129.
- Altbach, P., L. Reisberg, M. Yudkevich, G. Androushchak, and I. Pacheco (2012). *Paying the Professoriate. A Global Comparison of Compensation and Contracts*. New York, London: Routledge.
- Bender, K. and J. Heywood (2006). Job Satisfaction of the Highly Educated: The Role of Gender, Academic Tenure, and Earnings. *Scottish Journal of Political Economy* 53(2), 253–279.
- Benz, M. and B. S. Frey (2008). Being Independent is a Great Thing: Subjective Evaluations of Self-Employment and Hierarchy. *Economica* 75, 362–383.
- Berry, W., J. DeMerritt, and J. Esarey (2010). Testing for Interaction in Binary Logit and Probit Models: Is a Product Term Essential? *American Journal of Political Science* 54(1), 248–266.
- Boehm, J. K. and S. Lyubomirsky (2008). Does Happiness Promote Career Success? *Journal of Career Assessment* 16, 101–116.
- Bozeman, B. and M. Gaughan (2011). Job Satisfaction Among University Faculty: Individual, Work, and Institutional Determinants. *Journal of Higher Education* 82(2), 154–186.
- Cole, S., J. R. Cole, G. A. Simon, et al. (1981). Chance and Consensus in Peer Review. *Science* 214(4523), 881–886.
- Dasgupta, P. and P. A. David (1994). Toward a New Economics of Science. *Research Policy* 23, 487–521.
- Diener, E., R. Lucas, and C. Scollon (2006). Beyond the Hedonic Treadmill: Revising the Adaptation Theory of Well-Being. *American Psychologist* May-June, 305–314.
- Dolan, P., T. Peasgooda, and M. Whiteb (2008). Do We Really Know What Makes Us Happy? A Review of the Economic Literature on the Factors Associated With Subjective Well-Being. *Journal of Economic Psychology* 29, 94–122.
- Easterlin, R. A. (2006). Life Cycle Happiness and Its Sources: Intersections of Psychology, Economics, and Demography. *Journal of Economic Psychology* 27(4), 463–482.
- Edelman, B. and I. Larkin (2009). Demographics, Career Concerns or Social Comparison: Who Games SSRN Download Counts? Harvard Business School NOM Unit Working Paper 09-096.

- Ferrer-i Carbonell, A. and P. Frijters (2004). How Important is Methodology for the Estimates of the Determinants of Happiness? *The Economic Journal* 114(497), 641–659.
- Fisher, C. (2010). Happiness at Work. *International Journal of Management Reviews* 12, 384–412.
- Franzoni, C., G. Scellato, and P. Stephan (2011). Changing Incentives to Publish. *Science* 333, 702–703.
- Frey, B. S. (1997). *Not Just for the Money*. Elgar: Cheltenham UK and Northampton USA.
- Frey, B. S. and R. Eichenberger (1993). American and European Economics and Economists. *Journal of Economic Perspectives* 7(4), 185–193.
- Frey, B. S. and S. Neckermann (2009). Academics Appreciate Awards - A New Aspect of Incentives in Research. CESifo Working Paper Series No. 2531.
- Frey, B. S. and A. Stutzer (2001). *Happiness and Economics: How the Economy and Institutions Affect Human Well-Being*. Princeton University Press.
- Graber, M., A. L. and K. Walde (2008). Publish or Perish? The Increasing Importance of Publications for Prospective Professors in Austria, Germany and Switzerland. *German Economic Review* 9, 457–472.
- Greene, W. (2008). Testing Hypotheses About Interaction Terms in Nonlinear Models. *Economics Letters* 107, 291–296.
- Hamermesh, D. S. and G. A. Pfann (2011). Reputation and Earnings: The Roles of Quality and Quantity in Academe. *Economic Inquiry* 50(1), 1–16.
- IDEA Consult (2013). MORE 2 Mobility Patterns and Career Paths of EU Researchers: Remuneration - Cross Country Report. Project funded by the European Commission (DG Research).
- Inomics (2012). Economics Job Market Report. http://www.inomics.com/sites/default/files/INOMICS_job_market_report_2012.pdf.
- Kirchgaessner, G. (2005). Why Are Economists Different? *European Journal of Political Economy* 21, 543–562.
- Kuhn, T. (1962). *The Structure of Scientific Revolutions*. University of Chicago Press.
- McPherson, M. S. and G. C. Winston (1983). The Economics of Academic Tenure: A Relational Perspective. *Journal of Economic Behavior & Organization* 4(2-3), 163–184.

- Merton, R. K. (1957). Priorities in Scientific Discoveries: A Chapter in the Sociology of Science. *American Sociological Review* 22, 635–659.
- Miller, A., S. Taylor, and A. Bedeian (2011). Publish or Perish: Academic Life As Management Faculty Live It. *Career Development International* 16, 422 – 445.
- Necker, S. (2012). Wissenschaftliches Fehlverhalten - Ein Problem in der deutschen Volkswirtschaftslehre? *Perspektiven der Wirtschaftspolitik* 13, 267–285.
- Neff, B. D. and J. D. Olden (2006). Is Peer Review A Game of Chance? *BioScience* 56(4), 333–340.
- Origo, F. and L. Pagani (2009). Flexicurity and Job Satisfaction in Europe: The Importance of Perceived and Actual Job Stability For Well-Being at Work. *Labour Economics* 16(5), 547–555.
- Osterloh, M. and B. S. Frey (2011). Input Control and Random Choice - Improving The Selection Process For Journal Articles. mimeo.
- Roach and Sauermann (2010). A Taste for Science? PhD Scientists' Academic Orientation and Self-Selection into Research Careers in Industry. *Research Policy* 39(3), 422–434.
- Schafer, J. L. (1997). *Analysis of Incomplete Multivariate Data*, Volume 72. Chapman and Hall/CRC.
- Steiner, L. and L. Schneider (2013). The Happy Artist: An Empirical Application of The Work-Preference Model. *Journal of Cultural Economics* 37(2), 225–246.
- Stephan, P. (2012). *How Economics Shapes Science*. Harvard University Press.
- Stern, S. (2004). Do Scientists Pay to Be Scientists? *Management Science* 50, 835–853.
- Throsby, D. (1994). A Work-Preference Model of Artist Behaviour. In A. Peacock and I. Rizzo (Eds.), *Cultural Economics and Cultural Policies*, pp. 69–80. Dordrecht: Kluwer.
- Ward, M. and P. Sloane (2000). Non-Pecuniary Advantages Versus Pecuniary Disadvantages; Job Satisfaction Among Male And Female Academics In Scottish Universities. *Scottish Journal of Political Economy* 47(3), 273–303.

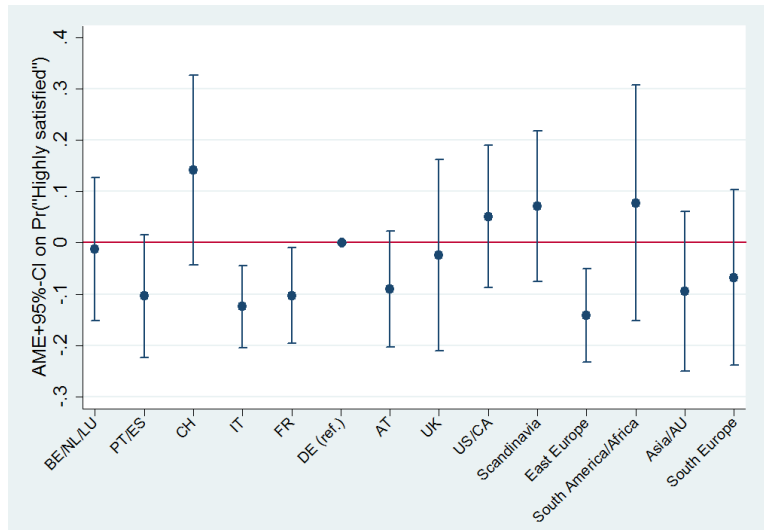
6 Tables and figures

Figure 1: Distribution of economists' life satisfaction



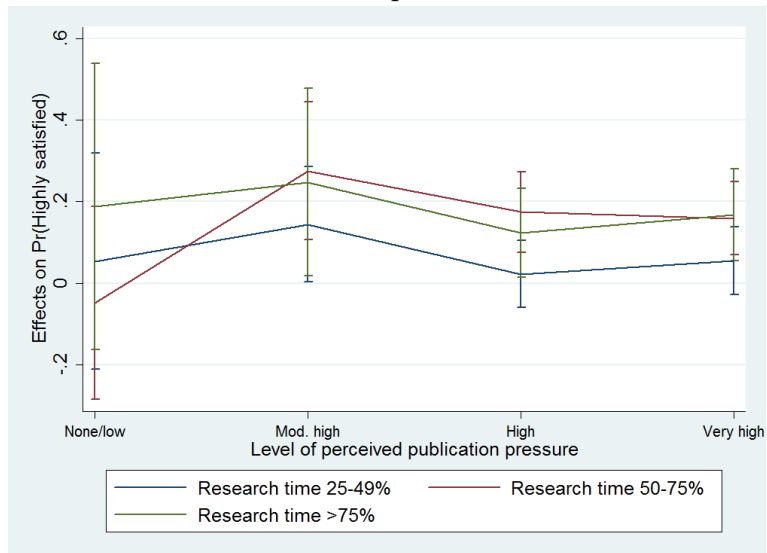
Note: Responses to the question “Generally speaking, how satisfied are you with the life you lead?” Based on observed data=923 observations.

Figure 2: Average marginal effects of origin on Pr(“highly satisfied”)



Note: Based on ordered probit regression shown in table 2. Average marginal effects compared to reference group “DE - Germany”.

Figure 3: Marginal effect of research time at different levels of pressure



Note: Based on ordered probit regression of equation (1) including interactions between pressure and research time.

Table 1: Summary statistics of explanatory variables

Variable	Mean	Std. Dev.
Past 3 year publication success: 0	0.1820	0.3859
Past 3 year publication success: 1	0.1426	0.3497
Past 3 year publication success: 2	0.1394	0.3464
Past 3 year publication success: 3-4	0.2846	0.4513
Past 3 year publication success: 5-7	0.1400	0.3471
Past 3 year publication success: 8+	0.1113	0.3146
Publication in top-journal	0.1051	0.3068
Time research < 25%	0.1460	0.3531
Time research 25 – 50%	0.2801	0.4491
Time research 50 – 75%	0.3495	0.4769
Time research > 75%	0.2244	0.4172
Publication pressure: none/low	0.0653	0.2471
Publication pressure: moderately high	0.1212	0.3264
Publication pressure: high	0.4430	0.4968
Publication pressure: very high	0.3704	0.4830
Publication pressure change: none	0.0139	0.1172
Publication pressure change: unchanged/decreased	0.0572	0.2322
Publication pressure change: slightly increased	0.0867	0.2815
Publication pressure change: increased	0.4465	0.4972
Publication pressure change: strongly increased	0.3957	0.4891
Pressure external funds: none/low	0.1687	0.3746
Pressure external funds: moderately high	0.2929	0.4552
Pressure external funds: high	0.3786	0.4851
Pressure external funds: very high	0.1597	0.3664
Pressure external funds change: none	0.0953	0.2936
Pressure external funds change: unchanged/decreased	0.0625	0.2421
Pressure external funds change: slightly increased	0.1722	0.3776
Pressure external funds change: increased	0.4088	0.4917
Pressure external funds change: strongly increased	0.2612	0.4394
Tenured position	0.5837	0.4930
Contract expiration within 1 year	0.1857	0.3889
Contract expiration within 2 years	0.1152	0.3193
Contract expiration within 3+ years	0.1154	0.3196
Male	0.7392	0.4391
Year of birth: > 1980	0.2212	0.4151
Year of birth: 1979-1970	0.3576	0.4793
Year of birth: 1969-1960	0.2229	0.4162
Year of birth: 1959-1950	0.1156	0.3198
Year of birth: < 1950	0.0827	0.2754
Employer: University	0.6974	0.4594
Employer: Other higher education institution	0.0469	0.2114
Employer: Research institute	0.1882	0.3909
Employer: Other	0.0675	0.2508
Rank: Full/associate professor	0.3522	0.4777
Rank: PhD	0.2540	0.4353
Rank: Researcher	0.1752	0.3801
Rank: Assistant professor	0.0959	0.2945
Rank: Other	0.1227	0.3281
Citizenship: BE/NL/LU	0.0293	0.1688
Citizenship: PT/ES	0.0368	0.1884
Citizenship: CH	0.0255	0.1576
Citizenship: IT	0.0655	0.2475
Citizenship: FR	0.2253	0.4178
Citizenship: DE	0.4186	0.4934
Citizenship: AT	0.0306	0.1723
Citizenship: UK	0.0171	0.1298
Citizenship: US/CA	0.0285	0.1664
Citizenship: Scandinavia	0.0364	0.1873
Citizenship: East Europe	0.0345	0.1825
Citizenship: South America/Africa	0.0163	0.1265
Citizenship: Asia/AU	0.0206	0.1419
Citizenship: South Europe	0.0150	0.1215
Followed invitation by European Economic Association	0.4561	0.4981
Followed invitation by German economic association	0.3266	0.4690
Followed invitation by French economic associations	0.2173	0.4125

Note: Based on 934 observations, averages of five complete data sets.

Table 2: Baseline results - Coefficients

	(1)	(2)	(3)	(4)	(5)
	b/se	b/se	b/se	b/se	b/se
Past 3 yrs. publication success: 0	(ref.)				(ref.)
Past 3 yrs. publication success: 1	0.036 (0.136)				0.075 (0.141)
Past 3 yrs. publication success: 2	-0.012 (0.143)				-0.037 (0.148)
Past 3 yrs. publication success: 3-4	0.167 (0.138)				0.129 (0.143)
Past 3 yrs. publication success: 5-7	0.201 (0.168)				0.088 (0.174)
Past 3 yrs. publication success: 8+	0.252 (0.170)				0.127 (0.174)
Top-journal among past 3 yrs. publications	0.125 (0.142)				0.075 (0.139)
Time research <25%		(ref.)			(ref.)
Time research 25-50%		0.199* (0.120)			0.200* (0.122)
Time research 50-75%		0.573*** (0.121)			0.579*** (0.125)
Time research >75%		0.508*** (0.140)			0.556*** (0.145)
Level publication pressure: none/low			0.209 (0.159)		0.224 (0.168)
Level publication pressure: mod. high			0.160 (0.124)		0.195 (0.124)
Level publication pressure: high			0.049 (0.081)		0.056 (0.081)
Level publication pressure: very high			(ref.)		(ref.)
No tenured position				-0.212* (0.111)	-0.245** (0.118)
Male	0.059 (0.088)	0.067 (0.089)	0.070 (0.088)	0.078 (0.087)	0.043 (0.090)
Year of birth: > 1980	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Year of birth: 1970 – 79	-0.076 (0.107)	-0.046 (0.107)	-0.036 (0.106)	-0.080 (0.108)	-0.092 (0.111)
Year of birth: 1960 – 69	-0.126 (0.140)	-0.009 (0.136)	-0.097 (0.136)	-0.174 (0.145)	-0.132 (0.148)
Year of birth: 1950 – 59	-0.030 (0.165)	0.040 (0.166)	-0.035 (0.164)	-0.102 (0.168)	-0.054 (0.174)
Year of birth: < 1950	0.057 (0.183)	0.077 (0.183)	0.059 (0.182)	-0.003 (0.184)	-0.025 (0.191)
Employer: University	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Employer: Other higher educ. institution	-0.077 (0.184)	0.000 (0.190)	-0.097 (0.183)	-0.093 (0.186)	-0.015 (0.194)
Employer: Research institution	0.088 (0.121)	0.063 (0.123)	0.100 (0.121)	0.114 (0.120)	0.057 (0.124)
Employer: Other employer	0.066 (0.183)	0.144 (0.181)	0.049 (0.182)	0.030 (0.181)	0.092 (0.183)
Rank: Professor	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Rank: Assistant	-0.271** (0.130)	-0.406*** (0.121)	-0.343*** (0.122)	-0.268** (0.129)	-0.255* (0.132)
Rank: PhD	-0.375** (0.172)	-0.622*** (0.149)	-0.525*** (0.147)	-0.399** (0.162)	-0.401** (0.182)
Rank: Other position	-0.216 (0.159)	-0.264* (0.151)	-0.329** (0.147)	-0.270* (0.151)	-0.135 (0.167)
Rank: Researcher	-0.229 (0.172)	-0.380** (0.167)	-0.316* (0.167)	-0.294* (0.166)	-0.333* (0.174)
Country dummies?	YES	YES	YES	YES	YES
Wave dummies?	YES	YES	YES	YES	YES
Wald Chi2	73.83	101.77	72.09	70.32	111.99
Pseudo R2	0.026	0.034	0.025	0.026	0.038
N	934	934	934	934	934

Dependent variable is life satisfaction reported on a scale from 1-6. Controls are binary. All 5 imputations are used, results combined using Rubin's rule. Hypothesis tests based on robust standard errors. Measures of fit are the lowest statistic among results from the five imputations. (ref.)=category is reference group. Significance levels : * : 10% ** : 5% *** : 1%.

Table 3: Baseline results - Average marginal effects on Pr(“highly satisfied”)

	(1)	(2)	(3)	(4)	(5)
	AME/SE	AME/SE	AME/SE	AME/SE	AME/SE
Past 3 yrs. publication success: 0	(ref.)				(ref.)
Past 3 yrs. publication success: 1	0.009 (0.035)				0.020 (0.037)
Past 3 yrs. publication success: 2	-0.003 (0.036)				-0.008 (0.037)
Past 3 yrs. publication success: 3-4	0.045 (0.037)				0.036 (0.038)
Past 3 yrs. publication success: 5-7	0.055 (0.046)				0.024 (0.046)
Past 3 yrs. publication success: 8+	0.070 (0.048)				0.036 (0.047)
Top-journal among past 3 yrs. publications	0.034 (0.039)				0.020 (0.038)
Time research <25%		(ref.)			(ref.)
Time research 25-50%		0.043* (0.025)			0.042* (0.025)
Time research 50-75%		0.145*** (0.028)			0.144*** (0.028)
Time research >75%		0.125*** (0.034)			0.138*** (0.035)
Level publication pressure: none/low			0.060 (0.048)		0.064 (0.050)
Level publication pressure: mod. high			0.045 (0.036)		0.054 (0.036)
Level publication pressure: high			0.013 (0.022)		0.015 (0.021)
Level publication pressure: very high			(ref.)		(ref.)
No tenured position				-0.058* (0.030)	-0.066** (0.031)
Male	0.016 (0.024)	0.018 (0.024)	0.019 (0.024)	0.022 (0.024)	0.012 (0.024)
Year of birth: > 1980	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Year of birth: 1970 – 79	-0.021 (0.030)	-0.012 (0.029)	-0.010 (0.030)	-0.023 (0.031)	-0.024 (0.031)
Year of birth: 1960 – 69	-0.034 (0.038)	-0.002 (0.037)	-0.027 (0.037)	-0.048 (0.040)	-0.034 (0.040)
Year of birth: 1950 – 59	-0.008 (0.047)	0.011 (0.046)	-0.010 (0.046)	-0.029 (0.047)	-0.015 (0.048)
Year of birth: < 1950	0.017 (0.054)	0.022 (0.052)	0.017 (0.053)	-0.001 (0.054)	-0.006 (0.054)
Employer: University	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Employer: Other higher educ. institution	-0.020 (0.047)	0.000 (0.051)	-0.025 (0.046)	-0.024 (0.047)	-0.004 (0.051)
Employer: Research institution	0.025 (0.034)	0.017 (0.034)	0.028 (0.035)	0.032 (0.035)	0.016 (0.034)
Employer: Other employer	0.018 (0.052)	0.041 (0.053)	0.014 (0.051)	0.008 (0.050)	0.025 (0.052)
Rank: Professor	(ref.)	(ref.)	(ref.)	(ref.)	(ref.)
Rank: Assistant	-0.078** (0.038)	-0.118*** (0.035)	-0.101*** (0.036)	-0.078** (0.038)	-0.069* (0.037)
Rank: PhD	-0.103** (0.047)	-0.166*** (0.038)	-0.144*** (0.039)	-0.111** (0.044)	-0.101** (0.046)
Rank: Other position	-0.063 (0.046)	-0.080* (0.045)	-0.097** (0.042)	-0.079* (0.043)	-0.026 (0.044)
Rank: Researcher	-0.067 (0.049)	-0.111** (0.046)	-0.094** (0.047)	-0.085* (0.046)	-0.079** (0.040)
Country dummies?	YES	YES	YES	YES	YES(*)
Wave dummies?	YES	YES	YES	YES	YES
Wald Chi2	73.83	101.77	72.09	70.32	111.99
Pseudo R2	0.026	0.034	0.025	0.026	0.038
N	934	934	934	934	934

See notes to table 2. Average marginal effects (AME) on probability to be “highly satisfied.” (ref.)=category is reference group. (*) Results reported in figure 2. Significance levels : * : 10% ** : 5% *** : 1%.

Table 4: Baseline results - Modifications

<i>I. Including information as ordinal variables</i>					
	(1)	(2)	(3)	(4)	(5)
	AME/SE	AME/SE	AME/SE	AME/SE	AME/SE
Past 3 yrs.: number (ordinal)	0.015*				0.008
	(0.009)				(0.009)
Past 3 yrs. publication success: in A-journal?	0.035				0.024
	(0.039)				(0.038)
Research time (ordinal)		0.052***			0.055***
		(0.012)			(0.012)
Level publication pressure (ordinal)			-0.020*		-0.022*
			(0.012)		(0.012)
No tenured position				-0.058*	-0.072**
				(0.030)	(0.032)
Other controls?	YES	YES	YES	YES	YES
Wald Chi2	71.23	94.74	71.74	68.45	107.12
Pseudo R2	0.026	0.032	0.025	0.025	0.038
N	934	934	934	934	934
<i>II. Excluding information on academic rank</i>					
	(1)	(2)	(3)	(4)	(5)
	AME/SE	AME/SE	AME/SE	AME/SE	AME/SE
Past 3 yrs. publication success: 0	(ref.)				(ref.)
Past 3 yrs. publication success: 1	0.013				0.022
	(0.033)				(0.036)
Past 3 yrs. publication success: 2	0.011				0.003
	(0.033)				(0.034)
Past 3 yrs. publication success: 3-4	0.066**				0.052
	(0.032)				(0.034)
Past 3 yrs. publication success: 5-7	0.081*				0.047
	(0.042)				(0.043)
Past 3 yrs. publication success: 8+	0.103**				0.061
	(0.045)				(0.044)
Top journal among past 3 yrs. publications?	0.050				0.034
	(0.039)				(0.037)
Time research <25%		(ref.)			(ref.)
Time research 25-50%		0.046*			0.038
		(0.025)			(0.025)
Time research 50-75%		0.140***			0.134***
		(0.028)			(0.029)
Time research >75%		0.109***			0.123***
		(0.033)			(0.035)
Publication pressure: none/low			0.060		0.060
			(0.047)		(0.049)
Publication pressure: mod. high			0.052		0.056
			(0.036)		(0.036)
Publication pressure: high			0.014		0.014
			(0.022)		(0.021)
Publication pressure: very high			(ref.)		(ref.)
No tenured position				-0.086***	-0.081***
				(0.026)	(0.030)
Other controls (except for rank)?	YES	YES	YES	YES	YES
Wald Chi2	60.50	71.07	52.34	55.38	101.47
Pseudo R2	0.023	0.024	0.019	0.022	0.037
N	934	934	934	934	934

Upper panel: Sets of dummies capturing the number of publications, research time, and perceived pressure replaced by ordinal variables. Lower panel: Other controls as in table 2 except for exclusion of the set of dummies indicating academic rank. Significance levels : * : 10% ** : 5% *** : 1%.

Table 5: Taking into account the change and a different type of pressure

	Pressure to...		
	publish	raise funds	raise funds
	(1)	(2)	(3)
	AME/SE	AME/SE	AME/SE
Does not perceive pressure	0.035 (0.046)		0.022 (0.032)
Change pressure: unchanged/decreased	0.066 (0.048)		0.107** (0.051)
Change pressure: slightly increased	0.106** (0.042)		0.063** (0.032)
Change pressure: increased	0.070*** (0.021)		0.059** (0.023)
Change pressure: strongly increased	(ref.)		(ref.)
Level pressure external funds: none/low		0.024 (0.037)	
Level pressure external funds: mod. high		0.026 (0.033)	
Level pressure external funds: high		0.018 (0.029)	
Level pressure external funds: very high		(ref.)	
Other controls as in column (5), table 2?	YES	YES	YES
Wald Chi2	118.40	109.27	116.78
Pseudo R2	0.042	0.038	0.040
N	934	934	934

Average marginal effect (AME) from ordered probit. Effect on Pr(“Highly satisfied”). All 5 imputations are used, results combined using Rubin’s rule. Hypothesis tests based on robust standard errors. Measures of fit are the lowest statistic among results from the five imputations. (ref.)=category is reference group. Significance levels : * : 10% ** : 5% *** : 1%.

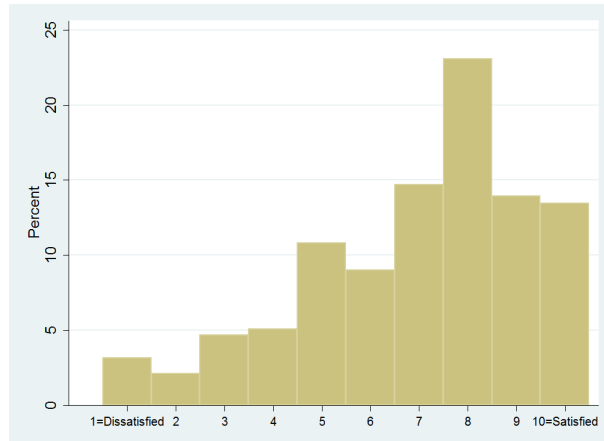
Table 6: Taking into account contract terms

	Effect on Pr("Highly satisfied")	
	(1)	(2)
	AME/SE	AME/SE
Tenured position	(ref.)	
Contract expires within...		
one year	-0.088*** (0.033)	
two years	-0.064 (0.041)	
three or more years	-0.044 (0.037)	
Tenured position		(ref.)
Contract renewable...		
No		-0.064** (0.031)
Yes		-0.059 (0.039)
Other controls as in column (5), table 2?	YES	YES
Wald Chi2	115.56	112.32
Pseudo R2	0.039	0.039
N	934	886

Average marginal effect (AME) from ordered probit. All 5 imputations are used, results combined using Rubin's rule. Hypothesis tests based on robust standard errors. Measures of fit are the lowest statistic among results from the five imputations. (ref.)=category is reference group. Significance levels : * : 10% ** : 5% *** : 1%.

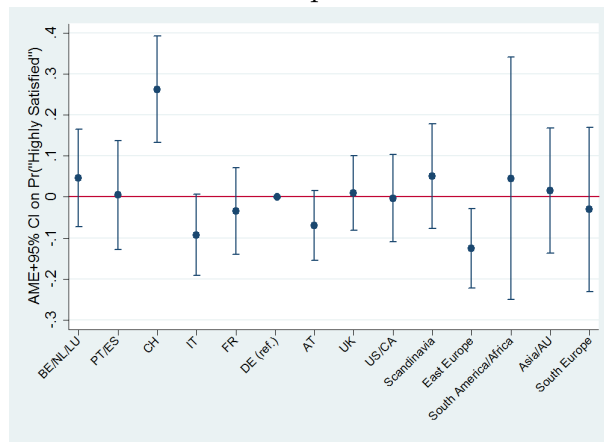
A.1 Online appendix: Additional results

Figure A.1: Life satisfaction of the general population



Note: Responses to question “All things considered, how satisfied are you with your life as a whole these days?” requested in European Value Survey 2008.

Figure A.2: Life satisfaction and location of workplace



Note: Based on ordered probit regression. Average marginal effects on being “highly satisfied” compared to reference group “DE - Germany.”

Table A.1: Correlation between variables

	No tenure	Pressure: none/low	Pressure: mod. high	Pressure: high	Pressure: very high	Publ. success: A	Publ. success: 0	Publ. success: 1	Publ. success: 2	Publ. success: 3-4	Publ. success: 5-7	Publ. success: 8+	Time re-search <25%	Time re-search 25-50%	Time re-search >75%	Rank: Professor	Rank: Assistant	Rank: PhD	Rank: Other position
No tenure	1.00																		
Publication pressure: none/low	-0.07	1.00																	
Publication pressure: mod. high	-0.08	-0.10	1.00																
Publication pressure: high	-0.03	-0.24	-0.33	1.00															
Publication pressure: very high	0.11	-0.20	-0.28	-0.68	1.00														
Publication pressure: very high	-0.18	-0.05	0.05	0.00	0.00	1.00													
Past 3 yrs. publication success: A	0.42	0.03	0.01	0.00	-0.02	-0.16	1.00												
Past 3 yrs. publication success: 0	0.09	0.01	-0.04	-0.03	0.05	-0.11	-0.19	1.00											
Past 3 yrs. publication success: 1	0.02	-0.06	0.04	-0.03	0.03	-0.06	-0.19	-0.16	1.00										
Past 3 yrs. publication success: 2	-0.20	0.00	-0.07	0.04	0.01	0.00	-0.30	-0.26	-0.25	1.00									
Past 3 yrs. publication success: 3-4	-0.17	0.02	0.06	-0.01	-0.03	0.15	-0.19	-0.16	-0.16	-0.25	1.00								
Past 3 yrs. publication success: 5-7	-0.17	0.00	0.02	0.02	-0.03	0.23	-0.17	-0.14	-0.14	-0.22	-0.14	1.00							
Past 3 yrs. publication success: 8+	-0.14	0.10	0.03	-0.02	-0.05	-0.11	0.00	0.16	-0.01	0.01	-0.08	-0.09	1.00						
Time re-search <25%	-0.15	-0.04	0.04	0.09	-0.09	0.00	-0.09	-0.02	0.00	0.07	0.02	0.01	-0.26	1.00					
Time re-search 25-50%	0.06	-0.02	-0.02	-0.03	0.06	0.08	0.03	-0.12	-0.03	-0.01	0.05	0.09	-0.30	-0.46	1.00				
Time re-search 50-75%	0.22	-0.02	-0.04	-0.04	0.08	0.00	0.07	0.02	0.04	-0.07	-0.02	-0.04	-0.22	-0.34	-0.39	1.00			
Time re-search >75%	-0.51	0.04	0.07	0.02	-0.09	0.34	-0.32	-0.15	-0.06	0.12	0.17	0.25	0.09	0.16	-0.03	-0.22	1.00		
Rank: Professor	0.27	-0.08	-0.08	-0.02	0.12	-0.10	-0.07	0.03	0.05	0.06	-0.02	-0.07	-0.11	-0.03	0.10	-0.43	1.00		
Rank: Assistant	0.51	-0.01	-0.03	0.01	0.02	-0.15	0.11	-0.04	-0.25	-0.17	-0.17	-0.15	-0.10	-0.13	0.05	-0.34	-0.27	1.00	
Rank: PhD	-0.04	0.02	0.03	0.02	-0.05	-0.11	0.06	0.10	0.02	-0.08	-0.01	-0.08	0.25	0.01	-0.14	-0.24	-0.19	-0.15	1.00
Rank: Other position	-0.17	0.05	0.01	-0.03	0.00	-0.10	-0.08	-0.04	0.05	0.09	-0.02	-0.02	-0.09	-0.05	-0.03	-0.28	-0.22	-0.17	-0.12
Rank: Researcher																			

Table A.2: Regressions only including tenured economists

	(1)	(2)	(3)	(4)	(5)
	AME/SE	AME/SE	AME/SE	AME/SE	AME/SE
Past 3 yrs. publication success: 0	(ref.)				(ref.)
Past 3 yrs. publication success: 1	0.001 (0.081)				0.005 (0.086)
Past 3 yrs. publication success: 2	0.039 (0.082)				0.017 (0.087)
Past 3 yrs. publication success: 3-4	0.051 (0.073)				0.029 (0.079)
Past 3 yrs. publication success: 5-7	0.046 (0.081)				-0.001 (0.085)
Past 3 yrs. publication success: 8+	0.139* (0.084)				0.084 (0.087)
Past 3 yrs. publication success: in A-journal?	0.080* (0.047)				0.063 (0.045)
Time research <25%		(ref.)			(ref.)
Time research 25-50%		0.063* (0.034)			0.061* (0.036)
Time research 50-75%		0.165*** (0.039)			0.153*** (0.041)
Time research >75%		0.203*** (0.062)			0.190*** (0.062)
Publication pressure: none/low			0.029 (0.062)		0.049 (0.063)
Publication pressure: mod. high			0.017 (0.048)		0.043 (0.048)
Publication pressure: high			-0.005 (0.033)		0.008 (0.032)
Publication pressure: very high			(ref.)		(ref.)
Other controls except for tenure?	YES	YES	YES	YES	YES
Wald Chi2	68.37	88.47	66.31	65.31	113.53
Pseudo R2	0.042	0.050	0.037	0.037	0.059
N	546	546	546	546	546

Upper panel: Same regressions as in table 2 except for set of dummies indicating academic rank. Lower panel: Same regressions as in table 2 but only including tenured economists. Significance levels : * : 10% ** : 5% *** : 1%.