



Working Paper Series

Does self-employment really raise job satisfaction? Adaptation and anticipation effects on self-employment and general job changes

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ECINEQ WP 2015 - 385

Does self-employment really raise job satisfaction? Adaptation and anticipation effects on self-employment and general job changes*

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Abstract

Empirical analyses using cross-sectional and panel data found significantly higher levels of job satisfaction for the self-employed than for employees. We argue that by neglecting anticipation and adaptation effects estimates in previous studies might be misleading. To test this, we specify models accounting for anticipation and adaptation to self-employment and general job changes. In contrast to recent literature we find no specific long-term effect of self-employment on job satisfaction. Accounting for anticipation and adaptation to job changes in general, which includes changes between employee jobs, reduces the effect of self-employment on job satisfaction by two-thirds. When controlling for anticipation and adaptation to job changes, we find a positive anticipation effect of self-employment and a positive effect of self-employment on job satisfaction in the first years of self-employment. After three years, adaptation eliminates the higher satisfaction of being self-employed. According to our results, previous studies overestimate the positive long-term effects of self-employment on job satisfaction.

Keywords: job satisfaction, self-employment, hedonic treadmill model, adaptation, anticipation, fixed effects panel estimation, German Socio-Economic Panel (SOEP).

JEL Classification: J23, J28, J81.

*We thank the International Association for Research and Wealth (IARIW) 2012 Boston conference participants and two anonymous referees for their helpful comments.

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1 Introduction

The economic and societal importance of the self-employed is unquestioned and is studied in a number of different fields (Parker 2009). Besides other aspects, job satisfaction of the self-employed has been of increasing interest within the last decade. Empirical research on job satisfaction in numerous studies has found that self-employed persons show substantially higher levels of job satisfaction than employees. This result has been consistently confirmed across Europe (e.g. Blanchflower and Oswald 1998, Blanchflower 2000, Benz and Frey 2004, 2008, Clark and Senik 2006) and for the USA and Canada (Kawaguchi 2008, Hundley 2001, Benz and Frey 2004). Among these papers are analyses based on cross sections as well as studies exploiting individual panel data to follow individuals over time.

With our analysis we contribute to the literature by proposing and testing a new explanation for a part of the difference in job satisfaction found in individual panel data between the self-employed and employees: anticipation and adaptation effects.

Adaption and anticipation effects can distort results when estimating regression models. For example, anticipation can distort effect results when individuals tend to be very dissatisfied with their employee work in the years before becoming self-employed. This leads to a comparable higher satisfaction level for the same individuals when self-employed, even when there is no lasting effect of self-employment on job satisfaction. In case of adaptation effects, individuals experience short-term benefits in subjective well-being after becoming self-employed. After some years people become used to being self-employed and satisfaction tends back to the baseline level.

Thus the main questions we address in this paper are:

- Are there anticipation effects which affect the estimation of the effect of self-employment on job satisfaction?
- Is there a long-term positive effect of self-employment on job satisfaction, or does individual satisfaction adapt to self-employment and return to an ex-ante satisfaction level?

The paper is structured as follows: Chapter 2 provides some background on explanations of self-employment job satisfaction. In Chapter 3 we briefly review recent adaptation literature and discuss how neglecting adaptation and anticipation affects estimated coefficients in a fixed effects regression setting. Chapter 4 introduces the data base used for the analysis and Chapter 5 describes our empirical strategy. In Chapter 6 we present a short descriptive analysis and our estimation results, which are summarized and discussed in Chapter 7.

2 Background and Literature

Empirical analyses on job satisfaction of the self-employed are based on cross sectional as well as on individual longitudinal (panel) data. Whereas panel data allows analysis of the individual's job situation over time, most cross sectional studies have the shortcoming of being based on the comparison of two groups of individuals at one point in time, employees and the self-employed. The reliability of the results depends on the comparability of these subgroups. As Blanchflower and Oswald (1998) note, higher satisfaction levels among the self-employed can also be due to self-selection of optimistic individuals into self-employment; for a review of literature on psychological characteristics of self-employed

persons see Brockhaus and Horwitz (1986). The finding that the same individuals on average experience higher job satisfaction when self-employed compared to when working as an employee is mostly interpreted as contradicting the hypothesis of more optimistic/happy people becoming self-employed.¹

The finding that the self-employed are more satisfied with work is surprising since the self-employed were found, compared to employees, to earn lower wages (Hamilton 2000, Carrington et al. 1996) or face a particular unequal income distribution often with low income (Merz 2007) and longer work hours (Eden 1975 for the United States; Hyytinen and Ruuskanen 2007 for Finland; Merz et al. 2009; Merz and Böhm 2008; and Merz and Burgert 2004a,b for Germany). Hamilton's (2000) analysis shows that the lower wages of the self-employed are not due to negative self-selection processes. Another explanation could be that self-employment offers non-monetary job aspects such as work autonomy which individuals appreciate. Following the theory of compensating wage differentials, the self-employed should earn lower wages if non-monetary gains from self-employment are higher. This view is also supported by Blanchflower and Oswald (1998: 46), who assume that "individuals get a non-pecuniary benefit from being their own boss." In line with this argument is the finding by Millán et al. (2011) that the higher job satisfaction of the self-employed compared to employees is attributable to the type of work rather than in terms of job security.

Indeed Benz and Frey (2004, 2008) find that the higher level of job satisfaction of the self-employed can largely be explained by the subjective evaluation of work autonomy. This result is consistent with earlier studies by Eden (1975) and Hundley (2001). Benz and Frey's (2004) analysis is based on cross-sectional data taken from the International Social Survey Program 1997. Using German, British, and Swiss individual panel data and accounting for unobserved, time constant, individual heterogeneity, Benz and Frey (2008) confirm the previous cross sectional findings. The authors interpret this result as support for a concept called *procedural utility*, where "procedural utility means that people do not only care about instrumental outcomes, as is usually assumed in economics, but also value the processes and conditions leading to outcomes" (Benz and Frey 2004: 98). An introduction to the concept of procedural utility can be found in Benz and Frey (2008).

Based on two results, first the result that the self-employed are more satisfied even when controlling for personality and, second, the result that differences disappear when controlling for procedural aspects, Benz and Frey (2008) conclude that differences in job satisfaction between the self-employed and employees can be explained by procedural utility, which is higher for self-employment due to higher levels of work autonomy. Benz and Frey do not explicitly mention whether they consider procedural utility as a permanently experienced utility and thus an effect which is not exposed to adaptation. It seems that this assumption is made implicitly.

¹A topic in the discussion about "who becomes self-employed" is the influence of personality characteristics. Whereas Blanchflower and Oswald 1998 for example do not rank psychology as a key factor, others like Zhao and Seibert 2006 or recently Caliendo, Fossen and Kritikos 2014 with data of the German Socio-Economic Panel 2000-2009 find that the personality structure (the big five traits and further personal characteristics) plays an important role in determining who becomes and succeeds as an entrepreneur. Though personality characteristics seems to play a role in determining the probability of becoming self-employed in Germany, our focus is not to explain becoming self-employed but rather to explain job satisfaction of the self-employed. Thus, all of these personality characteristics are already part of a self-employed person under investigation; a repeated specification in an appropriate regression model would cause an endogeneity problem and is therefore not further pursued.

In view of the approach chosen by Benz and Frey, it should be further remarked that the practice of using subjective variables as independent variables to explain other subjective evaluations is questionable. It might be that individuals who are satisfied with their job or optimistic in general tend to rate all aspects of a job more positively, independent of the objective job situation, thus reversing causality. For a short discussion of this problem see Hamermesh (2004). An analysis by Hanglberger (2011a), based on data for 31 European countries taken from the European Working Conditions Survey (EWCS), uses objective measures of work autonomy and finds large country differences for the effects of autonomy on employee job satisfaction. Whereas a remarkable and significant effect is found for countries with high welfare levels (UK, Ireland, Scandinavia and Continental Europe), no effect was found for Southern and Eastern European countries and Turkey.

Another explanation of differences in job satisfaction is suggested by Blanchflower and Oswald (1998) and Blanchflower et al. (2001). Both studies find that in surveys the rate of individuals who state that they would prefer to be self-employed to working as an employee is far higher than the actual rate of self-employment. The authors argue that differences in job satisfaction might be due to capital constraints for becoming self-employed. Capital constraints imply that only a small percentage of individuals who prefer self-employment can afford to do so the group of employees therefore consists, at least to a large extent, of persons who would prefer to be self-employed and are therefore less satisfied with their works an employee.

We extend this discussion by proposing and testing new explanation for a part of the difference in job satisfaction in individual panel data found between the self-employed and employees: anticipation and adaptation effects.

3 Theoretical considerations

The theory of the adaptation of subjective well-being measures is based on Brickman and Campbell's (1971) hedonic treadmill model. The authors argue that the appearance of a new incentive causes a temporary shift in subjective well-being. After some time, however, individuals return to their individual baseline or set point of happiness. Frederick and Loewenstein (1999) suggest that adaptation is an automatic habituation process where conscious perception of incentives is reduced when incentives appear constantly or repeatedly. Mechanisms of adaptation include changes in individual ideals, attention, and interests. Diener et al. (2006: 302) argue that "*the happiness system is thus hypothesized to reflect changes in circumstances rather than the overall desirability of the circumstances themselves.*" The main conclusion of this model is that life events cannot affect measures of subjective well-being permanently. Further research on adaptation theory has led to changes of Brickman and Campbell's (1971) original model. A review of relevant literature can be found in Diener et al. (2006).

So far, studies which find higher satisfaction levels for the self-employed do not refer to adaptation theory. Hence these analyses implicitly assume that changes in satisfaction levels are of permanent nature. Recent empirical research on adaptation processes finds evidence for adaptation to several life events. For instance Oswald and Powdthavee (2008) find that individuals who become disabled partly adapt in life satisfaction to their disability. Clark et al. (2008) show that there are different anticipation and adaptation effects of life satisfaction to different life events (divorce, birth of child, etc.). Lucas's (2005) analysis of adaptation to divorce is another example. Based on their analysis of major life event effects (marriage, divorce, birth of child, widowhood, but not unemployment) in a recent study, Clark and

Georgellis (2012) find support using German and British panel data for the hypothesis that adaption may be a general phenomenon.

Another effect, known as the Hawthorne or observer effect, might influence job satisfaction after becoming self-employed. The Hawthorne effect refers to tests in the Hawthorne General Electric firms between 1924-32, where results showed that increased productivity was not attributable to changes in the job environment but rather to increased attention to workers by corporate management and the press (Landsberger 1958). Thus, an individual changes behavior in response to the awareness of being observed rather than in response to changed job conditions, and once the observation (experiment) is over, the prior situation reasserts itself.

The Hawthorne effect might be generously translated to our case in the sense that a change in job satisfaction is not attributable to the job employment change itself but rather to the effect of being observed and faced with the supposed knowledge and aspiration (by society, family or her/himself) that self-employment in general is more satisfying than employment. Such a motivational aspect might influence the actual satisfaction measurement after becoming self-employed, which would then fade out because of a decreasing influence of aspiration.

So far most interest in the adaptation literature has been focused on analyses of how major life events affect measures of global satisfaction or happiness. Besides Powdthavee (2011), who studied anticipation and adaptation effects in the context of unionization, and Hanglberger (2011b), who examined adaptation to flexible working conditions, up to now there has been no literature on adaptation effects considering job satisfaction.

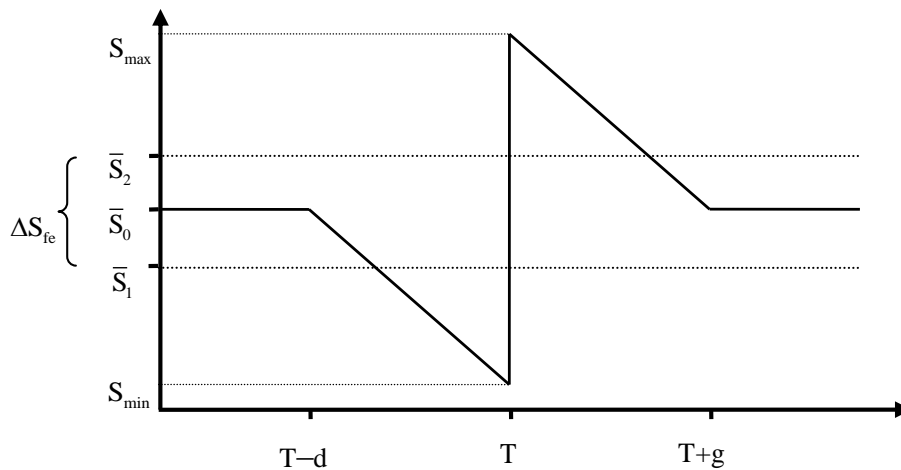
Illustrating adaptation and anticipation effects

The following graph (see Figure 1) illustrates how neglected adaptation and anticipation affects estimation results refer to linear fixed effects panel models. Unlike OLS regression based on cross-sectional data, fixed effects regression uses intra-individual variance of independent and dependent variables for estimation. That is, changes in an individual's dependent variable over time are explained by changes in the same person's independent variables.

In a simple model where job satisfaction is solely determined by being self-employed or being an employee, fixed effects regressions estimate the effect of self-employment on job satisfaction by comparing the satisfaction levels of those individuals who experienced changes in labour force status before and after the change occurred. In other words, the effect of self-employment is estimated as the difference between the average satisfaction as self-employed and the average satisfaction as an employee for those who experience both states.

Assuming that neither adaptation nor anticipation occurs, fixed effects regressions correctly estimate this permanent change in job satisfaction. If following a change to self-employment individuals experience only a temporary upward shift of job satisfaction, fixed effects estimation compares the average satisfaction as employee \bar{S}_0 with the average satisfaction as self-employed \bar{S}_2 (see Figure 1). \bar{S}_2 is a mixture of positive short-term effects and long-term baseline happiness \bar{S}_0 . Thus the estimation will yield a positive value for ΔS_{fe} even if self-employment does not cause long-term changes in satisfaction.

Figure 1: Fixed effects estimation with negative anticipation and full adaptation



Source: Own illustration; x-coordinate: time; y-coordinate: job satisfaction.

A similar effect occurs when the model is extended by anticipation. In Figure 1 a case of “negative” anticipation is illustrated: Prior to the change to self-employment at time T satisfaction declines down to S_{\min} . After becoming self-employed, satisfaction increases up to S_{\max} before individuals adapt to self-employment and satisfaction returns to the base level \bar{S}_0 . In our model the effect of self-employment is estimated as the difference between \bar{S}_2 and \bar{S}_1 . Thus anticipation can increase the overestimation of ΔS_{fe} caused by adaptation.

Furthermore it can be stated that the influence of anticipation and adaptation on results is larger with short observation periods before and after the change in labour force status. If the aim is to estimate long-term effects, the existence of unaccounted adaptation has as a result the overestimation of long-term effects. Since the existing literature shows that these effects appear for many life events, we believe that studies of causal effects of certain events or incentives on subjective well-being should test for adaptation and anticipation effects whenever possible.

The effect of anticipation on estimation results depends on the sign of anticipation effects. In principle both cases – “positive” and “negative” anticipation – might be possible. In our context positive anticipation could also originate from the knowledge of soon becoming self-employed. Unpleasant things might be easier to bear if one knows that they will not last long.

Negative anticipation could be caused by a breakdown of psychological mechanisms which usually leads to a positive self-perception. Knowing that one is soon becoming self-employed, individuals do not deceive themselves about their actual work life anymore and come to a less positive evaluation of working conditions.

A motivational explanation for negative anticipation could be that individuals become self-employed because their satisfaction with work as an employee was decreasing prior to self-employment. This could be the case when working conditions or the perception of working conditions deteriorates. This effect is similar to a phenomenon known in labour economics as Ashenfelter’s Dip. In his study on the effects of training programs on earnings, Ashenfelter (1978, p. 55) observed that “*all of the trainee groups suffered unpredicted earnings declines in the year prior to training. ... This suggests that simple before and after comparisons of trainees earnings may be seriously misleading evidence on the effect of training on earnings*”

...”. Neglecting this decline in earnings therefore leads to an overestimation of the job training effect.

Ashenfelter did not explicitly explain the reasons behind that dip and in our case there might also be many undetected reasons why we observe a similar picture. However, it might be the case that, in addition to the reasons mentioned above, in the expectation of approaching independent and self-determined employment the current job situation and its characteristics appear more disadvantageous than in previous periods, which then results in a drop in job satisfaction.

4 Data

In our analyses we used data from the German Socio-Economic Panel Study (SOEP), a nationally representative household panel which has been surveyed since 1984 in West Germany and 1990 in East Germany. The last wave which could be included was Wave 26 (surveyed in 2009). In 2009 10,394 households including 18,587 individuals were interviewed. Besides the items of main interest, employment status and job satisfaction, the SOEP includes information on a wide range of personal, household, and job characteristics (including wages, working hours, and working hour preferences), job history, occupation and industry, and other firm-related characteristics. Appendix 1 gives an overview of variables and definitions used in our analyses. Further information about sampling, survey methods and development of the SOEP can be found in Wagner et al. (2007) and Siegel et al. (2010).² For our analysis we used Stata 11.1 and the SOEP long data file.

Job satisfaction in the SOEP is surveyed every year using the question: “*How satisfied are you today with the following areas of your life? How satisfied are you with your job?*” Individuals rate their job on an 11-point scale ranging from 0 “*totally dissatisfied*” to 10 “*totally satisfied*”.

To analyse effects caused by changes in employment status between employee status and self-employment, we restricted the sample to individuals who are either self-employed or employees at date of interview and between 16 and 64 years of age. As self-employed individuals, we defined free-lance liberal professions and other self-employed persons. Family workers and farmers were excluded from the category of the self-employed. Civil servants, blue-collar and white-collar workers were classified as employees. Sixteen individuals who stated they were self-employed as well as employees were classified as self-employed. Observations from 1996 were not included in estimations, since for 1996 there is no information about working hour preference available, which was used as a control variable.

The definition of lag and lead variables (see Chapter 5) meant that observations from Wave 1 to 4 and 23 to 26 could not be included in our analysis, since for these observations no full set of leading and lagged information was available. Furthermore, we could only include individuals who reported being either self-employed or an employee in 9 consecutive years. Individuals with low employability might thus be underrepresented in our estimation sample

2 Further information including questionnaires and frequency tables for all items are accessible at: <http://panel.gsoep.de/soepinfo2009/>

because they have higher probabilities of becoming unemployed and thereby dropped out of our sample.³

A note concerning the interpretation of "anticipation" in our analysis: Narrowly defined, anticipation refers to expecting a new situation, here to being self-employed. However, with our data at hand we were not able to distinguish whether higher or lower job satisfaction before that event was caused by anticipation in this narrow sense or also due to other aspects. Thus we had to be cautious in interpreting the near situation before self-employment as anticipation only in its narrow sense. So, in the following we use the term anticipation (as Clark et al. 2008, p.230 did) in a broader sense which also captures other influences, including the above-mentioned motivational aspects for dynamics in job satisfaction prior to becoming self-employed.

5 Empirical strategy

Empirical literature consistently finds higher job satisfaction for the self-employed. Implicitly most analyses maintain the hypothesis that there is a positive and permanent effect of self-employment on job satisfaction. Our analysis aims to test whether the hypothesis is still supported when we account for the anticipation and adaptation effects of subjective well-being.

Benz and Frey (2008) find that individuals who become self-employed experience higher job satisfaction after this change, while there is no drop in job satisfaction for individuals who change from self-employment to work as an employee. Thus when analysing the effect of self-employment on job satisfaction two cases have to be distinguished: changes into and changes out of self-employment. The following analyses focus on changes into self-employment. Individual observations after a change from self-employment to work as an employee are therefore excluded from the analyses.

As described above, we use job satisfaction measured on an 11-point satisfaction scale as a proxy for individual on-the-job utility. Since we cannot determine exact differences in utility between points on this scale, satisfaction is measured with ordinal scaling. Ordinary least squares regression models assume metric scaling of the dependent variable. Hence the use of a regression model which accounts for the ordinal scaling of satisfaction measures is required. Widespread models meeting this demand are latent variable models such as the ordered-logit or ordered-probit model (Long 1997, McKelvey and Zavoina 1975 and recently Greene and Hensher 2010).

A second topic in the analysis of subjective well-being measures is inter-individual comparability. Standard regression models as well as models accounting for ordinal scaling are based on the assumption that satisfaction scores are comparable between individuals. If individuals systematically differ in the rating of same situations, the results of empirical analyses are unreliable. Such differences in ratings might be caused by socialization, genetic, or environmental influences. Respective empirical support was found by Arvey et al. (1989), Lykken and Tellegen (1996), and De Neve et al. (2010).

³Additional observations could be used if besides employees becoming self-employed also the unemployed becoming self-employed would be considered. We decided against this because the special interest of our paper is to test whether there are differences in satisfaction levels between the self-employed and employees. This also allows us to better compare our results to results from previous studies.

Further problems arise when components which are not observable or available in data, and therefore not incorporated in a regression model (e.g. genetic factors), affect both job satisfaction and independent variables such as employment status (omitted variable bias). In our context it can be argued that optimistic and risk-taking individuals have higher probabilities to become self-employed and tend to rate their work in a positive way. In this case the estimation of the effect of self-employment on satisfaction is upward-biased. This bias can also be seen as a causality problem, i.e. does self-employment increase job satisfaction or do happy people become the self-employed?

A solution to dealing with the problem of inter-individual comparability and with unobserved effects such as genetic factors is to use fixed effects regression models. In addition, when there is a program evaluation approach (Heckman, Lalonde and Smith 1999) and when becoming self-employed is interpreted as the treatment effect, the fixed effects regression approach solves the selection/omitted variable bias problem by including time invariant unobserved individual heterogeneity.⁴

Our final estimation sample includes 6,488 individuals and 37,158 person-year observations. All estimations (independent of the vector of control variables) are based on the same sample to ensure that differences in estimates of different models are not due to differing samples. Descriptive results are based on all person-year observations which fulfil the age and labour force status (employee or self-employed) restriction (see Appendix 2).

Model I without anticipation and adaptation effects

Our fixed effects regression model is specified as:

$$S_{it} = f_{it}\gamma + \mathbf{x}_{it}'\boldsymbol{\beta} + a_i + \varepsilon_{it}, \quad (\text{I})$$

where S_{it} is job satisfaction of individual i at time t . f_{it} is a dummy variable indicating whether an individual at time t is self-employed ($f_{it}=1$) or an employee ($f_{it}=0$). γ is the coefficient measuring the average effect of being self-employed on job satisfaction. \mathbf{x}_{it} is a vector of control variables and $\boldsymbol{\beta}$ a vector with the respective coefficients. The full set of controls (job, personal household, regional and period variables) is listed in Appendix 1. ε_{it} is the error term and a_i represents all unobserved individual characteristics which do not vary over the observation periods. If this unobserved individual heterogeneity is constant over time, it is cancelled out when estimating the model specified in (I) as fixed effects regression. Therefore unobserved individual heterogeneity which is not time varying, such as genetic disposition, does not cause an omitted variable bias in fixed effects models.

Since fixed effects regression uses intra-individual variation over time in independent variables to explain intra-individual variation of the dependent variable, we do not have to base our analysis on the assumption of inter-individual comparability of satisfaction measures. The effect of self-employment on satisfaction is estimated by the ratings of different situations by the same individual. Hence we only need to make the assumption that the ratings of an individual are consistent over the observation periods.

Using intra-individual variation also implies that our results about how self-employment affects job satisfaction are based on those individuals who moved between both types of

⁴Binder and Coad (2012) follow such a program evaluation approach. However it is based on a matching procedure. They found different effects on *life* satisfaction when becoming self-employed after being unemployed compared to being employed.

employment. A generalisation of our results to all individuals is only allowable if we assume that this group is representative for the whole population (no self-selection processes into self-employment); an assumption which is rather unlikely.

A plausible solution to handle the ordinal scaling problem in a fixed effects context would be the estimation of an ordered-probit fixed effects model. However Greene (2002) shows that estimates of this model are biased. Recent research using panel data thus employs either linear fixed effects models (assuming metric scaling) or use a POLS (probit-adapted ordinary least squares) approach as suggested by van Praag and Ferrer-I-Carbonell (2008). The van Praag and Ferrer-I-Carbonell model is based on an additional assumption, namely that subjective well-being is normally distributed. Since the POLS model relaxes one assumption by making another one, and Ferrer-I-Carbonell and Frijters (2004) find that differences in estimators are rather small when assuming the cardinality or ordinality of satisfaction measures, we decided to estimate linear fixed effects models only.

In Equation (I) we specified a model with a coefficient γ which captures the ceteris paribus difference in job satisfaction between years in self-employment and years as an employee. The difference of this estimate is based only on those individuals who moved between employee status and self-employment during the observation periods. As discussed above, the literature shows that many events or incentives do not cause constant changes of satisfaction measures, but rather that people adapt to changes, and satisfaction sometimes anticipates events.

Model II with anticipation and adaptation to self-employment

To account for anticipation and adaptation effects, we follow the specification suggested by Frijters et al. (2011) and Clark et al. (2008) and specify Model (II):

$$S_{it} = f_{it,T-4}\gamma_{T-4} + f_{it,T-3}\gamma_{T-3} + f_{it,T-2}\gamma_{T-2} + f_{it,T-1}\gamma_{T-1} + f_{it,T}\gamma_T + f_{it,T+1}\gamma_{T+1} + f_{it,T+2}\gamma_{T+2} + f_{it,T+3}\gamma_{T+3} + f_{it,T+4+}\gamma_{T+4+} + \mathbf{x}_{it}'\boldsymbol{\beta} + a_i + \varepsilon_{it}, \quad (II)$$

where $f_{it,T-4}$ to $f_{it,T+4+}$ are dummy variables indicating whether an individual is self-employed, how long he is self-employed or if he will become self-employed within the next years. $f_{it,T}$ is 1 only if individual i did work as an employee the year before t and is self-employed at the time of interview in year t . Otherwise $f_{it,T}$ is 0.⁵

In order to describe adaptation, the model is extended by four dummies $f_{it,T+1}$, $f_{it,T+2}$, $f_{it,T+3}$, and $f_{it,T+4}$ indicating that an individual is self-employed since and throughout 1-2, 2-3, 3-4, or more than 4 years. Anticipation of changes in labour force status are captured by the dummies $f_{it,T-1}$, $f_{it,T-2}$, $f_{it,T-3}$ and $f_{it,T-4}$. These dummies analogously indicate that individual i will become self-employed within the next year, 1-2, 2-3, or 3-4 years.

The dummies $f_{it,T-4}$ to $f_{it,T+4+}$ in (II) are defined in such a way that only one of the dummies can be 1 and all other dummies must be 0. If an individual is neither self-employed nor becoming self-employed within the next four years, all dummy variables are 0. Hence the coefficients can be interpreted with reference to those years when an individual is an employee and is not

⁵The data only allows a one-year perspective, i.e. the individuals have to be characterized as self-employed or an employee within a certain year regardless whether it is at the beginning or the end of the year. Thus, $t-1$ could characterize one month or eleven months, say, before changing to self-employment. The estimated effect therefore is some average over the year.

becoming self-employed in the coming four years.⁶ For example γ_T is the ceteris paribus average difference in satisfaction of individuals who are in their first year of self-employment, compared to the time when they were not self-employed and not becoming self-employed within the next 4 years.

Model III with anticipation and adaptation for any job change

Theoretically, anticipation, adaptation, and the long-term effects of becoming self-employed found by regression estimates could be due to a general effect caused by any job change regardless of a change between being an employee and being self-employed.⁷ We will test whether this is the case by extending Equation (I) by the dummies $c_{it,T-4}$ to $c_{it,T+4}$. Those dummies capture anticipation and adaptation effects on a change of jobs, which might also be a change between two employee jobs. The dummies are defined analogously to $f_{it,T-4}$ to $f_{it,T+4}$ as introduced in Equation (II) with respect to self-employment. Only the definition of $c_{it,T+4}$ (general job change 4 to 5 years ago) differs from $f_{it,T+4}$ (self-employed since more than 4 years). Thus in specification (III) we control for anticipation and adaptation to any job change and capture self-employment with a single dummy variable.

$$S_{it} = f_{it} \gamma + c_{it,T-4} \delta_{T-4} + c_{it,T-3} \delta_{T-3} + c_{it,T-2} \delta_{T-2} + c_{it,T-1} \delta_{T-1} + c_{it,T} \delta_T + c_{it,T+1} \delta_{T+1} + c_{it,T+2} \delta_{T+2} + c_{it,T+3} \delta_{T+3} + c_{it,T+4} \delta_{T+4} + \mathbf{x}'_{it} \boldsymbol{\beta} + a_i + \varepsilon_{it} \quad (\text{III})$$

Model IV with anticipation and adaptation for any job change and self-employment

In a last specification (IV) we test whether there are separate anticipation and adaptation effects on self-employment compared to job changes in general. Thus we include $c_{it,T-4}$ to $c_{it,T+4}$ to capture adaptation and anticipation to any job changes and $f_{it,T-4}$ to $f_{it,T+4}$ to account for separate anticipation and adaptation effects of self-employment.

$$S_{it} = f_{it,T-4} \gamma_{T-4} + f_{it,T-3} \gamma_{T-3} + f_{it,T-2} \gamma_{T-2} + f_{it,T-1} \gamma_{T-1} + f_{it,T} \gamma_T + f_{it,T+1} \gamma_{T+1} + f_{it,T+2} \gamma_{T+2} + f_{it,T+3} \gamma_{T+3} + f_{it,T+4} \gamma_{T+4} + c_{it,T-4} \delta_{T-4} + c_{it,T-3} \delta_{T-3} + c_{it,T-2} \delta_{T-2} + c_{it,T-1} \delta_{T-1} + c_{it,T} \delta_T + c_{it,T+1} \delta_{T+1} + c_{it,T+2} \delta_{T+2} + c_{it,T+3} \delta_{T+3} + c_{it,T+4} \delta_{T+4} + \mathbf{x}'_{it} \boldsymbol{\beta} + a_i + \varepsilon_{it} \quad (\text{IV})$$

All estimations include the same vector of controls \mathbf{x} (see Appendix 1). Table 11 summarizes all regression models, which we will present in the following chapter.

⁶ This includes years when an individual changed from being self-employed to working as an employee.

⁷ Job changes and job satisfaction with respect to quit behavior is analyzed by Levy-Garboua et al. 2007. The propensity to quit a job for Levy-Garboua is based on a microeconomic model where the expected present value becomes lower in their present job than in an alternative job or non-employment. Though the interesting link between quit and satisfaction might be transformed in our case into a pure job change mobility model (between two employee jobs or even between employment and self-employment), the Levy-Garboua et al. approach is still a mobility model where transformed satisfaction is the explanatory variable to explain job change propensity. In our model, however, job satisfaction is the variable to be explained so this approach does not really fit our concerns.

Table 1: Overview of estimated regression models

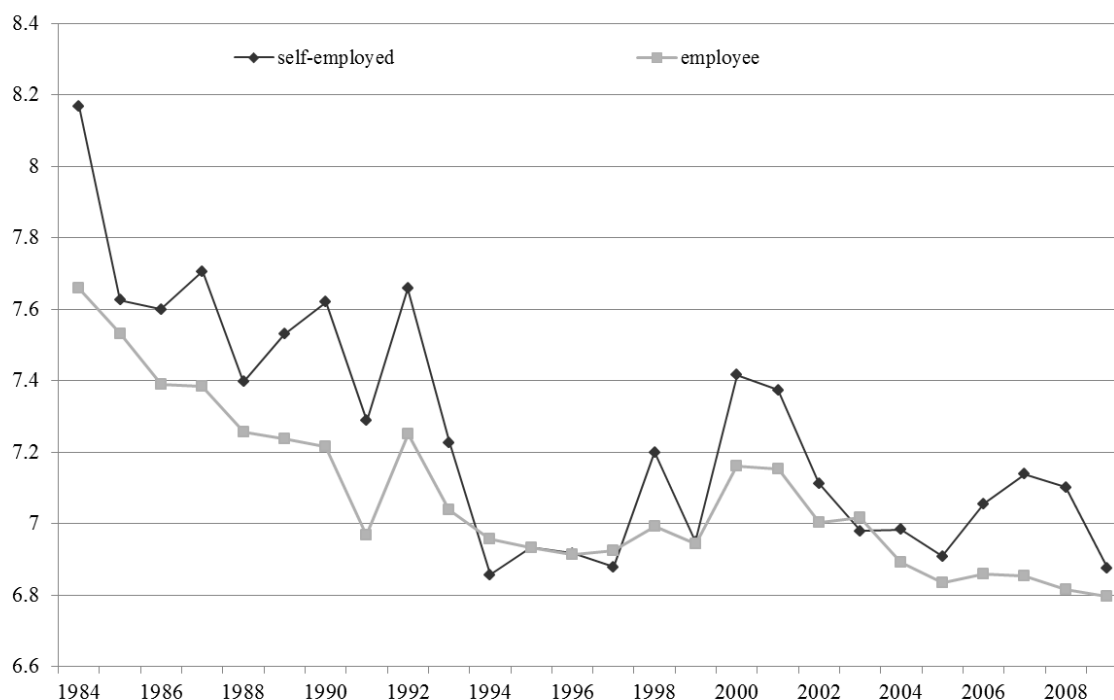
Model	Self-employment	Job change	Controls
I	dummy	–	yes
II	anticipation and adaptation	–	yes
III	dummy	anticipation and adaptation	yes
IV	anticipation and adaptation	anticipation and adaptation	yes

Source: Own compilation, for a detailed list and description of control variables see Appendix 1.

6 Results

The job satisfaction of the self-employed in Germany is on average higher than for employees (7.20 compared to 7.05 on an 11-point scale). As can be seen in Figure 2 average satisfaction of both subgroups follows a similar trend over time, but there are considerable differences in the gap between job satisfaction for employees and the self-employed. For three out of 26 years the average is slightly higher for employees.

Figure 2: Average job satisfaction of the self-employed and employees in Germany 1984 to 2009

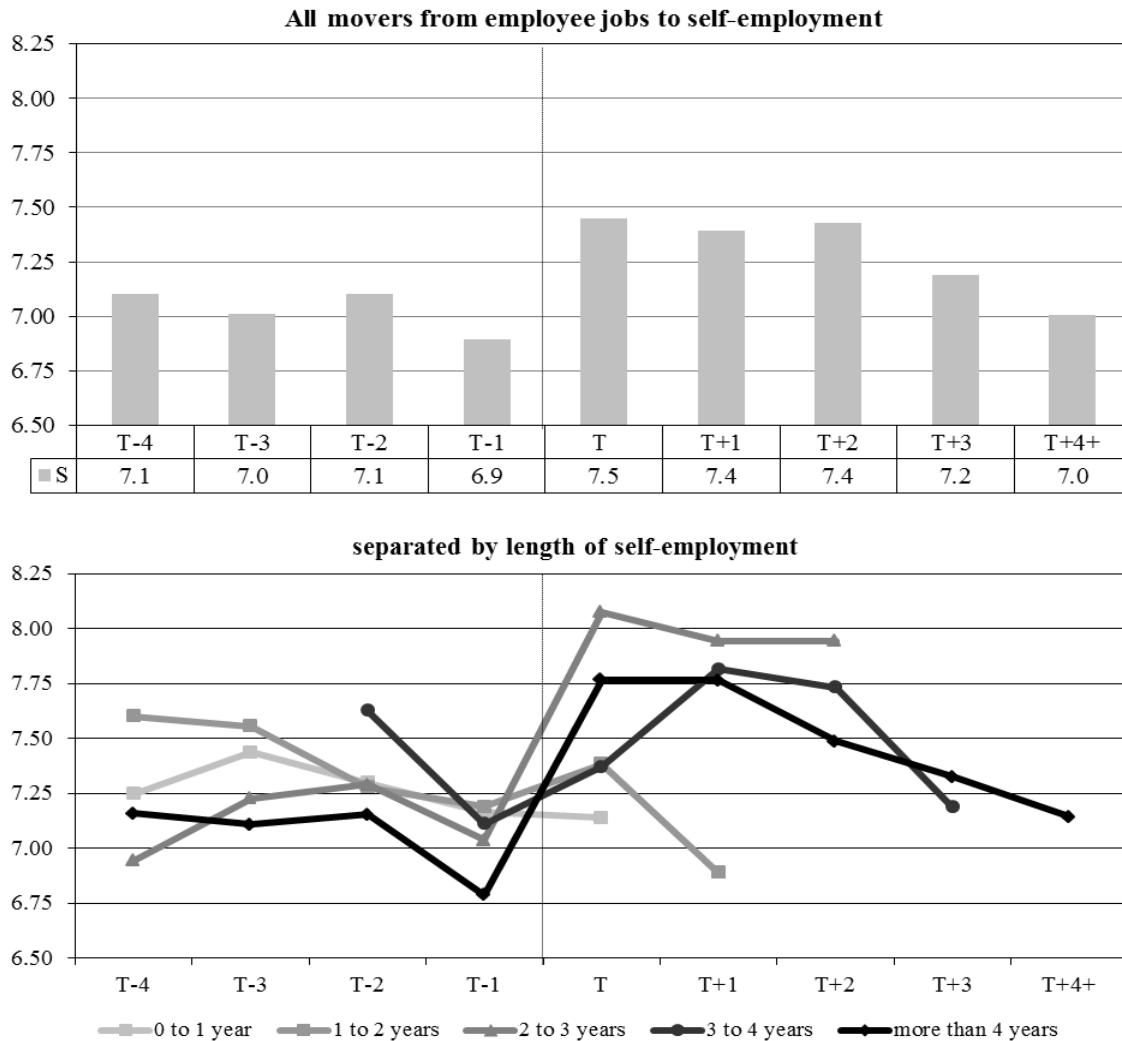


Source: Own calculations based on SOEP 1984-2009; weighted data, age 16 to 64.

The following analysis deals with possible anticipation and adaptation effects of self-employment or job changes in general. A first impression can be received from Figure 3. The figure shows the average job satisfaction of individuals who become self-employed within the next four years (T-4, ..., T-1), became self-employed within the last four years (T, ..., T+3) or have been self-employed for more than four years (T+4+). It can be seen that job satisfaction decreases by 0.2 points in the year prior to self-employment. With the change from work as an employee to self-employment, job satisfaction raises by 0.6 points. This level of job satisfaction is held for three years. After three years, satisfaction drops back to the ex-ante

level of satisfaction. The second part of Figure 3 shows that individuals who change back to being an employee within two years experienced only a small or no increase in job satisfaction. The development of job satisfaction for those who stay self-employed for three, four or more than four years is quite similar and indicates that there is a negative anticipation and adaptation to self-employment.

Figure 3: Average job satisfaction before and after a move from an employee job to self-employment



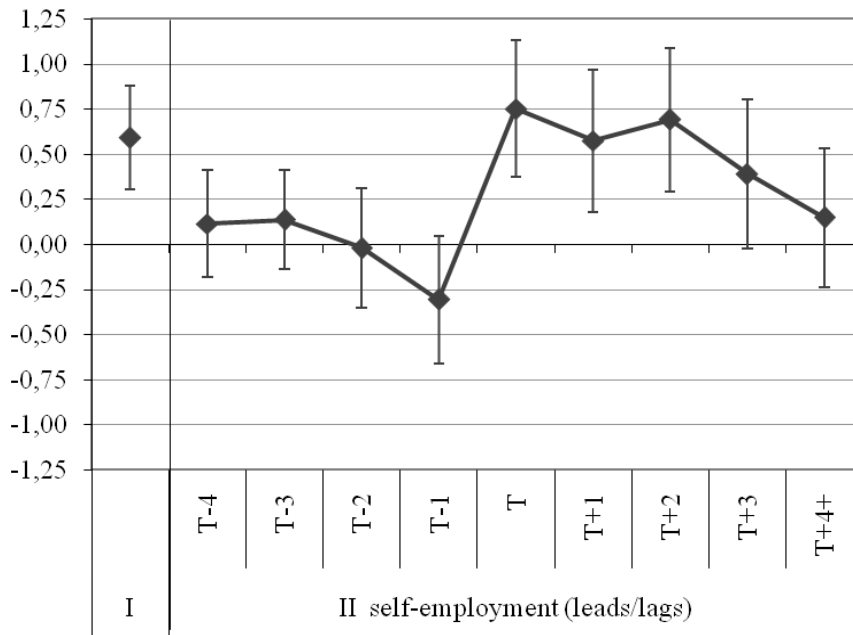
Notes: T-4: 3 to 4 years prior to self-employment, etc., T: first year of self-employment, T+1: second year in self-employment, etc., T+4+: self-employed since at least 4 years.

Source: Own calculations based on SOEP 1984-2009; weighted; age 16 to 64.

Model I without anticipation and adaptation effects

As a first step in our analysis we estimated Model I to reproduce the result found by several empirical studies that job satisfaction is higher for the self-employed than for employees. This result can be interpreted as an average higher satisfaction level for the same individuals when self-employed than when working as an employee. After controlling for income, working hours and other variables, we find that the effect of self-employment amounts to approximately 0.59 points on an 11-point satisfaction scale. A result which is in line with previous findings.

Figure 4: The effect of self-employment on job satisfaction in fixed effects regression models with and without accounting for anticipation and adaptation



Note: 90% confidence intervals (robust standard errors); for detailed regression results see Appendix 3; for descriptive statistics on estimation sample see Appendix 2.

Source: Own illustration based on fixed effects regression Models I and II with control variables based on SOEP data 1984-2009;

Model II with anticipation and adaptation to self-employment

To test whether the effect of self-employment found in Model I might be caused by anticipation and adaptation effects as discussed in Chapter 3, we estimated Model II, which includes dummy variables to capture adaptation and anticipation effects on self-employment for up to four years. Estimation results are shown graphically in Figure 4 and detailed in Appendix 3. The coefficients of Model II can be interpreted as the average difference in job satisfaction after being self-employed for a certain number of years (adaptation) or becoming self-employed in a certain number of years (anticipation) compared to working as an employee with no upcoming self-employment within the next four years.

There is no significant anticipation effect estimated, but during the first year in self-employment individuals experience a remarkable upward shift in job satisfaction, especially compared to the preceding year. The effect amounts to 1.06 ($\gamma_T - \gamma_{T-1}$) points on average. Individuals hold this satisfaction level for approximately three years before satisfaction drops back to the baseline.

As illustrated in Figure 1 unaccounted adaptation to self-employment will lead to an overestimation of long-term effects. This theoretically derived result fits our empirical findings. The effect of self-employment is found to be positive in Model I, while in Model II with adaptation and anticipation we find no significant long-term effect. So far our results suggest that self-employment does not raise job satisfaction in the long run, but individuals who become self-employed experience significantly higher job satisfaction for approximately three years.

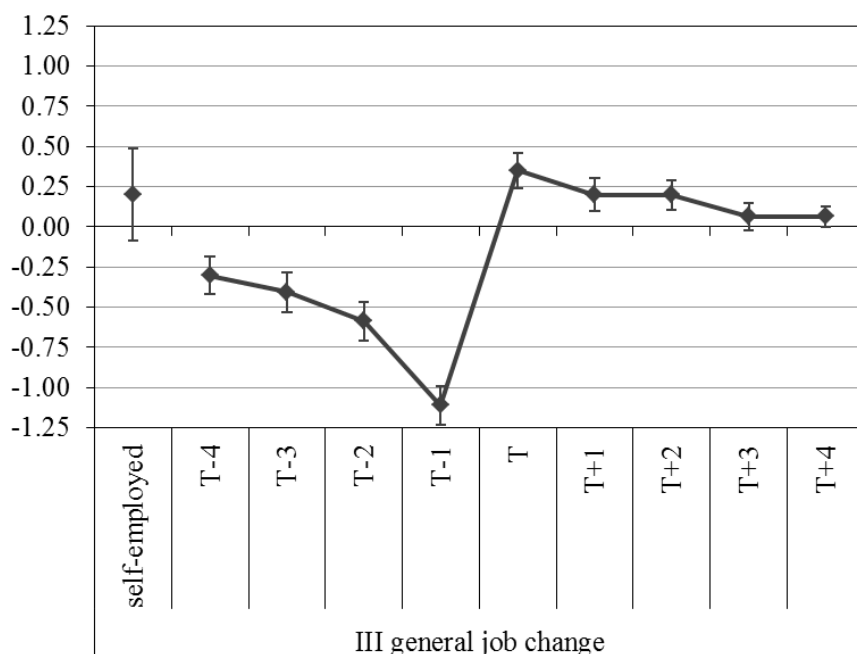
Model III with anticipation and adaptation for any job change

In Model II we analysed anticipation and adaptation of movers from employee work to self-employment. Of course the same anticipation and adaptation effects might occur when individuals move between two employee jobs. To test whether the estimated effect is a general effect accompanying any change of jobs rather than a specific effect of self-employment, we estimate two more models. Model III accounts for anticipation and adaptation to a change of jobs regardless of whether the change involves a change between two employee jobs and becoming self-employed after being an employee. In this setting self-employment is included in the model as a single dummy variable. Model IV accounts separately for adaptation and anticipation to job changes in general and to changes from being an employee to being self-employed.

Accounting for anticipation and adaptation of job changes reduces the effect of self-employment on job satisfaction substantially. We found a significant difference of 0.59 points in Model I, Model III estimates an approximately two-thirds lower and not significant effect of 0.20 points. Thus the results support the view that the largest part of higher job satisfaction of the self-employed found by studies based on fixed effects regressions can be explained without accounting for anticipation and adaptation to job changes (see Figure 5).

Job changes in general seem to be accompanied by very pronounced negative anticipation effects. The upward shift in job satisfaction in the first year is even more pronounced than for self-employment in estimation of Model II. Similar to adaptation to self-employment there seems to be adaptation to job changes in general as well.

Figure 5: The effect of general job change on job satisfaction in fixed effects regression models when accounting for anticipation and adaptation



Note: 90% confidence intervals (robust standard errors); for detailed regression results see Appendix 3; for descriptive statistics on estimation sample see Appendix 2.

Source: Own illustration based on fixed effects regression Model III with control variables based on SOEP data 1984-2009;

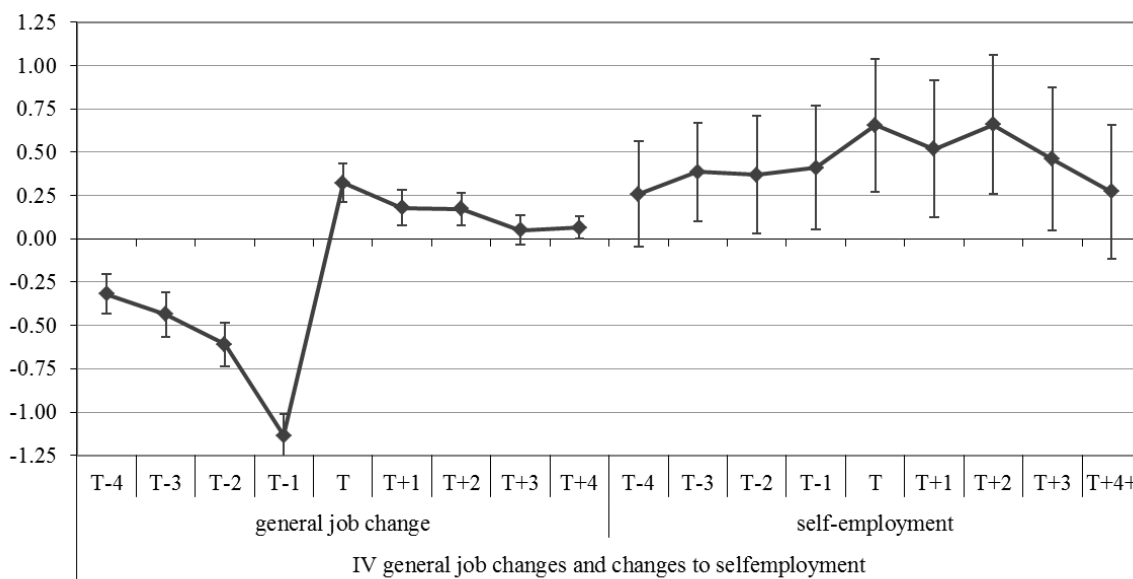
Model IV with anticipation and adaptation for any job change and for self-employment

In Model III (Figure 5) we do not allow for different anticipation and adaptation patterns for changes from employee jobs to self-employment and changes between two employee jobs. Model IV extends Model III by estimating specific anticipation and adaptation effects on self-employment. Since a change to self-employment is also a job change in general, coefficients of anticipation and adaptation to self-employment in Model IV should be interpreted as a deviation from the anticipation and adaptation pattern for general job changes.

The extension of our model has a negligible effect on anticipation and adaption effects on general job changes (Figure 6). Considering a change involving becoming self-employed, we find significant positive anticipation and a significant positive effect of self-employment for 3 to 4 years. Thus negative anticipation for individuals who become self-employed is less pronounced and the gain in the first three years of self-employment is substantially higher than for job changes in general. Nevertheless there is no significant long-term effect of self-employment on job satisfaction.

To sum up, our results contradict the widespread finding that self-employed individuals experience substantially higher satisfaction levels than employees. As our results show, once anticipation and adaptation are considered, no statistically significant long-term differences in job satisfaction between the self-employed and employees are visible.

Figure 6: The effect of general job change and self-employment on job satisfaction in fixed effects regression models when accounting for anticipation and adaptation



Note: 90% confidence intervals (robust standard errors); for detailed regression results see Appendix 3; for descriptive statistics on estimation sample see Appendix 2.

Source: Own illustration based on fixed effects regression Model IV with control variables based on SOEP data 1984-2009;

Main findings:

- The estimates of long-term effects on measures of subjective well-being might be misleading when anticipation and adaptation effects are neglected.

- Individuals who become self-employed noticeably improve their level of job satisfaction, especially when compared to the year before self-employment.
- Positive effects of self-employment on job satisfaction are only found for the first three years of self-employment; long-term effects are not significant as individuals adapt to self-employment.

7 Discussion and conclusion

The aim of this study into test whether the higher levels of job satisfaction of the self-employed compared to employees found by many previous studies might be due to neglecting anticipation and adaptation effects in measures of subjective well-being.

We theoretically derive how estimates of the effect of self-employment in fixed effects regression models might be misleading in the presence of anticipation and/or adaptation effects. Our estimates show that individuals who become self-employed noticeably improve their level of job satisfaction when compared to the year before self-employment. However the positive effect of self-employment lasts for only three years.

Furthermore, we estimate fixed effects regression models which account for anticipation and adaptation of job satisfaction to job changes independent of a change in self-employment. Due to our data base, anticipation encompasses not only a lookahead to self-employment but also other influences prior to becoming self-employed. Our results show that negative anticipation effects are a general and pronounced effect preceding any change of jobs. Individuals who become self-employed experience less distinctive negative anticipation. A positive effect of self-employment on job satisfaction lasting three years is also found in this model. In the long run we find that the self-employed are not better off than employees; put more precisely, we cannot reject the hypothesis that job satisfaction is *ceteris paribus* the same for the self-employed and employees.

So our results contradict the findings presented by e.g. Blanchflower and Oswald (1998) and Clark and Senik (2006). The concept of procedural utility as an explanation for differences in satisfaction levels as proposed by Benz and Frey (2004, 2008) is also not supported by our results. If there is a utility gain from the higher procedural utility of self-employment, the effect is not lasting. Our results suggest that the experience of procedural utility is not constant or, in other words, procedural utility is subject to adaptation effects. Furthermore, our results do not support the hypothesis of capital constraints causing differences in job satisfaction (Blanchflower and Oswald 1998), since there is no long-term effect of self-employment on job satisfaction.

So, the general question remains: why do individuals become self-employment when the mentioned reasons including even no long-termed job satisfaction do not really count? May be people have unrealistic and/or exaggerated expectations, may be people have no job alternatives as an employee; may be there is a mix of many reasons.

The group of the self-employed analysed is a very heterogeneous group. The group consists of free-lance professionals and other self-employed persons. One can imagine that the working life of a free-lance professional is quite different than the working life of a business owner; and, there is heterogeneity between various business owners. This difference might explain to a certain extent the large variance of the estimates of self-employment on job satisfaction when accounting for anticipation and adaptation effects.

Questions remain for future research including the look at differences between subgroups of the self-employed such as free-lancers and business owners. Furthermore, it would be interesting to see how life satisfaction or different sub-domains of job satisfaction such as satisfaction with pay or with hours worked respond to changes in employment status.

8 Appendix

Appendix 1: Variables and definitions

Variable	Definition
SELF EMPLOYMENT	
(lags and leads)	
Self-employed	Dummy
Self-employed T-4	Dummy; will become self-employed in 4-5 years, employee till then
Self-employed T-3	Dummy; will become self-employed in 3-4 years, employee till then
Self-employed T-2	Dummy; will become self-employed in 2-3 years, employee till then
Self-employed T-1	Dummy; will become self-employed in 1-2 years, employee till then
Self-employed T	Dummy; became self-employed during the last year
Self-employed T+1	Dummy; became self-employed 1-2 years ago, since then self-employed
Self-employed T+2	Dummy; became self-employed 2-3 years ago, since then self-employed
Self-employed T+3	Dummy; became self-employed 3-4 years ago, since then self-employed
Self-employed T+4+	Dummy; became self-employed more than 4 ago, since then self-employed
JOB CHANGE (lags and leads)	
Job change T-4	Dummy; will change job in 4-5 years, in the same job till then
Job change T-3	Dummy; will change job in 3-4 years, in the same job till then
Job change T-2	Dummy; will change job in 2-3 years, in the same job till then
Job change T-1	Dummy; will change job in 1-2 years, in the same job till then
Job change T	Dummy; changed job during the last year
Job change T+1	Dummy; changed job 1-2 years ago, since then in same job
Job change T+2	Dummy; changed job 2-3 years ago, since then in same job
Job change T+3	Dummy; changed job 3-4 years ago, since then in same job
Job change T+4	Dummy; changed job 4-5 years ago, since then in same job
JOB	
Job satisfaction	(Dependent variable) 11-point scale: 0= totally unhappy, 10= totally happy
ln(personal income)	ln(monthly net income (earned), €)
Experience full-time	Years of labour market experience as full-time worker
Experience part-time	Years of labour market experience as part-time worker
Experience unemployment	Years of labour market experience as unemployed
Activity is job	Activity is job
Working hours	Working hours per week
Working hours ²	Working hours per week ² /100
Work less	Would prefer to work X hours less, when taking into account that income would change accordingly(not available for 1996, observations from 1996 are excluded from regression estimations)
Work more	Would prefer to work X hours more, when taking into account that income would change accordingly (not available for 1996, observations from 1996 are excluded from regression estimations)
Part-time	Dummy; part time worker with 5-29 hours of work per week
Liberal profession	Dummy
Occupation	25 dummies for occupations based on ISCO88 classification: Military; Legislators and senior officials; Corporate managers; Managers of small enterprises; Physical, mathematical, and engineering science professionals; Life science and health professionals; Teaching professionals; Other professionals; Physical and engineering science associate professionals; Life science and health associate professionals; Teaching associate professionals; Other associate professionals; Customer services clerks; Personal and protective services workers; Models, salespersons, and demonstrators; Skilled agricultural and fishery workers; Extraction and building trades workers; Metal, machinery, and related trades workers; Precision, handicraft, craft printing and related trades workers; Other craft and related trades workers; Stationary plant and related operators; Machine

	operators and assemblers; Drivers and mobile plant operators; Sales and services elementary occupations; Agricultural, fishery, and related labourers; Labourers in mining, construction, manufacturing, and transport (reference: office clerks)
Industry	17 industry dummies based on NACE classification: farming, forestry, fishing; mining etc.; manufacturing; energy and water supply; construction; trading; hotel and restaurant industry; traffic and transport; insurance; real estate; services for enterprises; public sector; education; health and social; private households; religion, culture and sports; other services (reference: research and databases)
PERSONAL	
Age ²	= Age in years ² /100
Hobbies (h/weekday)	Average hours spent for hobbies on a weekday
Marital status	5 dummies for married and living separated, single, divorced, widowed, and partner abroad (reference: married and living together)
Partnership	Dummy living in a partnership
HOUSEHOLD	
Household size	5 dummies for 2, 3, 4, 5, and 6 or more person households (reference: single households)
Children	3 dummies for 1, 2, 3 or more children up to the age of 16 in household (reference: no children)
Mortgage	Interest and mortgage payment per month in € /1000
Rent	Monthly rent excluding heating costs in € /1000
Owner	Owner of house or flat
ln(residual income)	ln((household net income – personal income)€ /1000)
REGION	
East Germany	Dummy variable
German federal states	15 dummies for German federal states: Berlin, Schleswig-Holstein; Hamburg; Bremen; North Rhine-Westphalia; Hessen; Rhineland-Palatinate; Saarland; Baden-Wuerttemberg; Bavaria; Mecklenburg-West Pomerania; Brandenburg; Saxony-Anhalt; Thuringia; Saxony (reference: Lower Saxony)
YEAR	Wave dummies for 1989 to 2005; (reference: 1988)

Source: Own compilation.

Appendix 2: Descriptive statistics on main variables of estimation sample

	Mean	Std.dev.	Min.	Max.
Job satisfaction	7.130	1.851	0	10
Self-employment				
T-4	0.003	0.056	0	1
T-3	0.004	0.060	0	1
T-2	0.004	0.061	0	1
T-1	0.004	0.061	0	1
T	0.003	0.055	0	1
T+1	0.003	0.054	0	1
T+2	0.003	0.054	0	1
T+3	0.003	0.057	0	1
T+4+	0.044	0.206	0	1
General job changes (leads und lags)				
T-4	0.019	0.137	0	1
T-3	0.022	0.146	0	1
T-2	0.026	0.160	0	1
T-1	0.035	0.183	0	1
T	0.037	0.188	0	1
T+1	0.037	0.190	0	1
T+2	0.039	0.193	0	1
T+3	0.040	0.196	0	1
T+4	0.056	0.229	0	1

	Mean	Std.dev.	Min.	Max.
JOB				
ln(net income (earned))	7.213	0.528	3.219	9.638
experience (full-time, years)	17.932	9.491	0	47
experience (part-time, years)	1.925	4.506	0	41
experience (unemployment, years)	0.281	0.884	0	24
activity is job	0.587	0.492	0	1
working hours/week	40.558	10.044	0.5	80
working hours ² /100	17.458	8.169	0.003	64
prefers to work # hours less	5.119	7.004	0	70
prefers to work # hours more	0.799	3.152	0	51
part-time	0.101	0.302	0	1
liberal profession	0.015	0.120	0	1

Source: Own calculations based on SOEP 1984-2009.

Observations in different lead and lag situations before and after changing from employment to self-employment in the estimation sample

self-employment	T-4	T-3	T-2	T-1	T	T+1	T+2	T+3	T+4+
all	115	135	141	140	111	109	107	120	1,647

How to read the table: e.g. T-4: The sample includes 115 observations of individuals four years prior to the individuals' changes from being an employee to self-employment; T+4+: The sample includes 1,647 observations of individuals four and more years after the individuals' changes to self-employment.

Source: Own calculations based on SOEP 1984-2009.

Appendix 3: Fixed effects regression results – The effect of self-employment on job satisfaction with and without anticipation and adaptation effects

	I	II	III	IV
SELF-EMPLOYMENT				
Self-employed (dummy)	0.590 ^{***}		0.201	
	(3.40)		(1.16)	
Self-employed				0.259
T-4		0.115		(1.40)
		(0.63)		0.385*
T-3		0.137		(2.24)
		(0.83)		0.370 ⁺
T-2		-0.021		(1.80)
		(-0.10)		0.411 ⁺
T-1		-0.307		(1.89)
		(-1.43)		0.656 ^{**}
T		0.752 ^{**}		(2.82)
		(3.27)		0.518*
T+1		0.575*		(2.15)
		(2.40)		0.660 ^{**}
T+2		0.691 ^{**}		(2.70)
		(2.84)		0.459 ⁺
T+3		0.391		(1.83)
		(1.55)		0.271
T+4 or more		0.147		(1.16)
		(0.63)		0.259

	I	II	III	IV
JOB CHANGE				
(lead and lag variables)				
T-4			-0.302*** (-4.37)	-0.318*** (-4.49)
T-3			-0.407*** (-5.32)	-0.436*** (-5.54)
T-2			-0.587*** (-7.90)	-0.610*** (-7.96)
T-1			-1.111*** (-14.89)	-1.135*** (-14.98)
T			0.349*** (5.20)	0.323*** (4.73)
T+1			0.199** (3.23)	0.179** (2.84)
T+2			0.198*** (3.57)	0.172** (3.02)
T+3			0.064 (1.27)	0.051 (0.99)
T+4 or more			0.064 (1.62)	0.064 (1.62)
JOB				
ln(net income (earned))	0.516*** (7.78)	0.519*** (7.84)	0.459*** (7.13)	0.459*** (7.14)
experience (full-time. years)	-0.115 (-1.28)	-0.115 (-1.28)	-0.110 (-1.23)	-0.112 (-1.25)
experience (part-time. years)	-0.099 (-1.09)	-0.010 (-1.10)	-0.094 (-1.04)	-0.097 (-1.07)
experience (unemployment. years)	0.322 (1.64)	0.318 (1.62)	0.058 (0.32)	0.051 (0.28)
activity is job	0.026 (0.66)	0.027 (0.69)	0.039 (1.02)	0.040 (1.05)
working hours/week	-0.010 (-1.14)	-0.010 (-1.11)	-0.010 (-1.21)	-0.010 (-1.18)
working hours ² /100	0.015 (1.54)	0.015 (1.51)	0.015 (1.59)	0.015 (1.56)
prefers to work # hours less	-0.013*** (-6.21)	-0.013*** (-6.20)	-0.013*** (-6.31)	-0.013*** (-6.28)
prefers to work # hours more	-0.018*** (-4.52)	-0.018*** (-4.52)	-0.018*** (-4.53)	-0.018*** (-4.54)
part-time	0.058 (0.66)	0.060 (0.69)	0.060 (0.70)	0.061 (0.72)
liberal professions	0.206 (1.39)	0.202 (1.37)	0.240 ⁺ (1.65)	0.249 ⁺ (1.72)
CONTROLS				
(for details see Appendix 1)				
occupation and industry	✓	✓	✓	✓
person and household	✓	✓	✓	✓
region	✓	✓	✓	✓
years	✓	✓	✓	✓
R ² within	0.0277	0.0286	0.0487	0.0492
min. observations/individual#	2	2	2	2
max. observations/individual	17	17	17	17
mean observations/individual	5.727	5.727	5.727	5.727
individuals	6,488	6,488	6,488	6,488
observations	37,158	37,158	37,158	37,158

Note: t statistics based on robust standard errors in parentheses; + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; sample: age 15-64; # To be read as: For an individual with 2 observations we could use two years. For each of these two years we additionally considered information about the same individual 4 years before and afterwards. A minimum of 2 observations per individual therefore encompass 2 times 9 = 18 observations.

Source: Own calculations based on SOEP 1984-2009.

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