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**Are Self-Employed Really Happier Than Employees? –  
An Approach Modelling Adaptation and Anticipation Effects to  
Self-Employment and General Job Changes**

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# **Are Self-Employed Really Happier Than Employees? – An Approach Modelling Adaptation and Anticipation Effects to Self- Employment and General Job Changes**

**Dominik Hanglberger and Joachim Merz**

## **Abstract**

Empirical analyses using cross-sectional and panel data found significantly higher levels of job satisfaction for self-employed than for employees. We argue that those estimates in previous studies might be misleading by neglecting anticipation and adaptation effects. For testing we specify several models accounting for anticipation and adaptation to self-employment and general job changes. Based on data from the German Socio-Economic Panel Survey (SOEP) we find that becoming self-employed is associated with large negative anticipation effects.

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 no further anticipation effect of self-employment and a weak positive but not significant effect of self-employment on job satisfaction for three years. Thus adaptation wipes out higher satisfaction within the first three years being self-employed. According to our results previous studies at least overestimated possible positive effects of self-employment on job satisfaction.

**JEL:** J23, J28, J81

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

# **Are Self-Employed Really Happier Than Employees? – An Approach Modelling Adaptation and Anticipation Effects to Self- Employment and General Job Changes**

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## **1 Introduction and Background**

Empirical research on job satisfaction in numerous studies found that self-employed persons show substantially higher levels of job satisfaction than employees. This result was 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 those papers are analyses based on cross sections as well as studies exploiting individual panel data to follow individuals over time.

Most cross sectional studies have the shortcoming of being based on the comparison of two groups at one point in time, the employees and the self-employed. The reliability of the results depends on the comparability of these subgroups. As Blanchflower and Oswald (1998) noted, higher satisfaction levels among self-employed can also be due to selection of optimistic individuals into self-employment; for a review of literature on psychological characteristics of self-employed individuals see Brockhaus and Horwitz (1986). The finding that the same individuals on average experience higher job satisfaction when being self-employed compared to when working as an employee<sup>3</sup> is mostly interpreted as contradicting the hypothesis of more optimistic/happy people, who become self-employed.

The finding that self-employed are more satisfied with work is surprising since self-employed were found to earn lower wages (Hamilton 2000, Carrington et al. 1996) respectively face a particular unequal income distribution with a profound part of low income (Merz 2007) and work more 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) than employees. Hamilton's (2000) analysis shows that lower wages of self-employed are not due to negative self selection processes. Another explanation could be, that self-employment offers non-monetary job aspects, like work autonomy which individuals appreciate. Following the theory of compensating wage differentials, 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 presumed 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 higher job satisfaction of self-employed compared to employees is attributed rather to the type of work than in terms of job security.

Indeed Benz and Frey (2004, 2008) found that the higher level of job satisfaction of self-employed can largely be explained by the subjective evaluation of work autonomy. This result is in compliance 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) confirmed the previous cross sectional findings. The authors interpret this result as support for a concept

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<sup>3</sup> Usually this is tested by estimating fixed-effects regression models on individual panel data.

called *procedural utility*. Whereas “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 self-employed are more satisfied even when controlling for personality<sup>4</sup>, second the result that differences disappear when controlling for procedural aspects, Benz and Frey (2008) conclude that differences in job satisfaction of 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 if 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.

In view of the approach chosen by Benz and Frey it should further be remarked that using subjective variables as independent variables to explain other subjective evaluations is debatable. 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 and 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’s 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 getting self-employed. Capital constraints implicate that only a small part of individuals, who prefer self-employment, can afford to do so. The group of employees therefore consists at least in large parts of persons who would prefer to be self-employed and are therefore less satisfied with their employee work.

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 between self-employed and employees in individual panel data: anticipation and adaptation effects.

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

Thus the main questions we address in this paper are:

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4 Unobserved individual heterogeneity in fixed-effects regression models accounts for personality differences not measured elsewhere.

- 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 resulting to an ex ante satisfaction level?

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

## 2 Theoretical considerations

Theory of 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. As mechanisms of adaptation changes in individual ideals, attention, and interests are suggested. Diener et al. (2006: 302) reason 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 lead to changes of Brickman and Campbells (1971) original model. A review of related literature can be found in Diener et al. (2006).

So far studies, which found higher satisfaction levels for self-employed, did not refer to adaptation theory. By neglecting adaptation processes the assumption is made that changes in satisfaction levels are of permanent nature. Recent empirical research on adaptation processes does not support this assumption for several life events. For instance Oswald and Powdthavee (2008) found that individuals, who become disabled, partly adapt in life satisfaction to their disability. Clark et al. (2008) showed that there are different anticipation and adaptation effects of life satisfaction to different life events (divorce, birth of child, etc.). Lucas (2005) analysis of adaptation to divorce is another of that kind. Clark and Georgellis (2012) with German and British panel data recently found support for the hypothesis that adaption may be a general one based on their analysis of major life event effects (marriage, divorce, birth of child, widowhood but not for unemployment).

So far most interest in the adaptation literature was put on the analyses of how major life events affect measures of global satisfaction or happiness. Up to now there is no literature on adaptation effects of job satisfaction except Powdthavee (2011), who studies anticipation and adaptation effects in the context of unionization, and Hanglberger (2011b), who examined adaptation to three kinds of flexible working conditions.

### Illustrating adaptation and anticipation effects

To illustrate the effect of neglected adaptation and anticipation we will discuss three cases. The discussion is referring to the estimation results of linear fixed-effects panel models and is presented graphically.

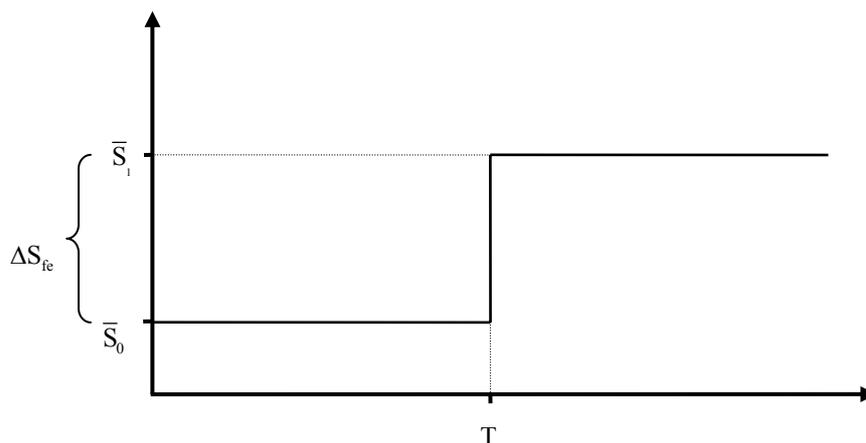
Unlike standard ordinary least squares regression models based on cross-sectional data, fixed-effects regression models do not use inter-individual differences in variables to estimate coefficients, but are based on intra-individual variance of independent and dependent variables. That is, changes in individual's dependent variable over time are explained by changes in the same person's independent variables.

We start with a simple model with one dummy variable indicating the labour force status and assume that the dependent variable, job satisfaction, is only determined by this dummy variable indicating if an individual is self-employed or an employee. In this setting fixed-effects regressions estimate the effect of self-employment on job satisfaction by comparing 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 when being self-employed and the average satisfaction as employee of those who experience both states.

### Transition without anticipation and adaptation

Figure 1 illustrates the case, when an individual switches from employee work to self-employment at time  $T$  assuming a constant positive effect of self-employment on job satisfaction. Since job satisfaction was assumed to be only dependent on employment status without adaptation or anticipation, job satisfaction is on a constant level  $\bar{S}_0$  as employee and rises to  $\bar{S}_1$  at time  $T$ . Fixed effects regressions would therefore correctly estimate  $\Delta S_{fe}$  as the effect of self-employment on job satisfaction.

**Figure 1: Fixed effects estimation without anticipation and adaptation effects**



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

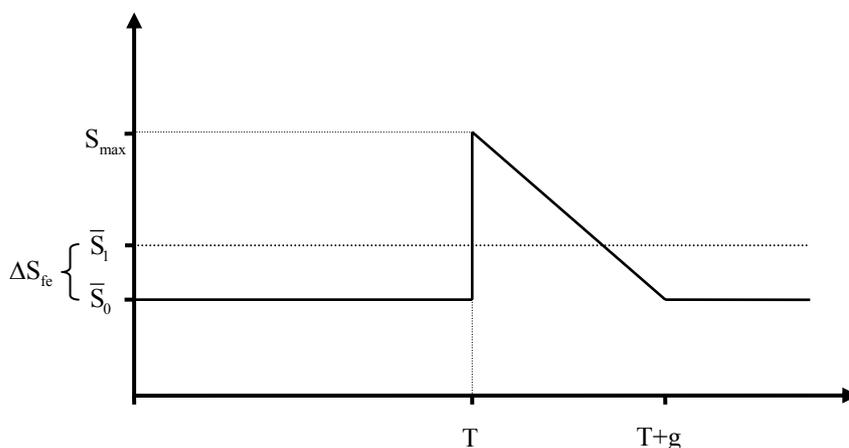
### Transition with adaptation

Let us now assume that adaptation occurs. Following a change into self-employment individuals experience a temporary shift rather than a permanently higher level of job

satisfaction. This case is shown in Figure 2. At time  $T$ , when individuals become self-employed, they experience a shift in job satisfaction up to  $S_{max}$ . After  $T$  individuals fully adapt to positive aspects of self-employment and the satisfaction level declines back to the base level  $\bar{S}_0$ . In this case fixed effects estimation compares the average satisfaction as employee  $\bar{S}_0$  with the average satisfaction as self-employed. Average satisfaction as a self-employed  $\bar{S}_1$  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  $\Delta S_{fe}$  even if self-employment does not cause long term changes in satisfaction. Further it can be stated that the estimated effect is larger, the shorter the observation period is after changing in self-employment.

If one aims to estimate long term effects of self-employment on job satisfaction, in fixed-effects regressions, which do not account for adaptation, the existence of adaptation leads to an overestimation of long-term effects.

**Figure 2: Fixed effects estimation with adaptation effect**



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

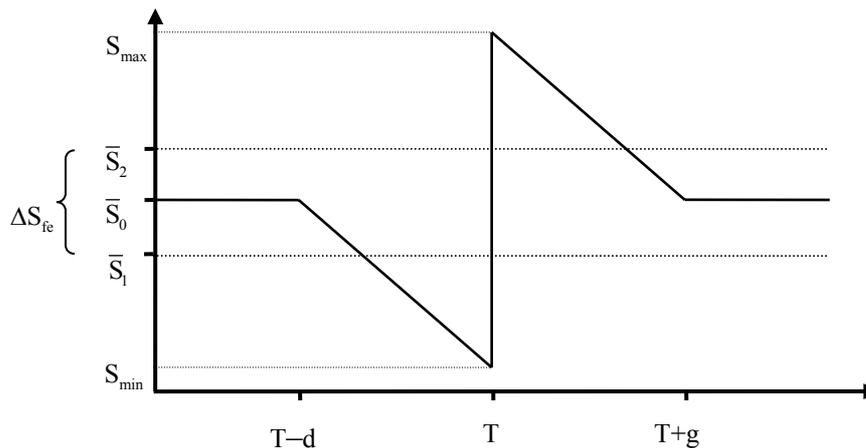
**Transition with anticipation and adaptation**

The following case extends the above discussed situation by anticipation. In principle two cases – positive and negative anticipation – are possible. Positive anticipation in our context could originate from the knowledge of being self-employed soon. Unpleasant things might be easier to bear, if one knows, that it will not last for long anymore. Negative anticipation could be caused by the breakdown of psychological mechanisms, which usually lead to a positive self-perception. A motivational explanation for negative anticipation could be that individuals become self-employed because their satisfaction with employee work is decreasing prior to self-employment. This can be the case when working conditions or the perception of working conditions deteriorates. This effect is similar to a phenomenon in labour economics called Ashenfelter’s Dip (see Cahuc and Zylberberg 2004: 174). Ashenfelter (1978) shows in an analysis of training programs on wages that wages of participants in training programs decrease prior to the training program. Neglecting this decline in earnings therefore leads to an overestimation of the job training effect.

A case with negative anticipation and a temporary positive effect of self-employment is illustrated in Figure 3. Prior to self-employment satisfaction declines down to  $S_{min}$ . When becoming self-employed satisfaction increases up to  $S_{max}$  before individuals adapt to self-

employment and satisfaction returns to the base level  $\bar{S}_0$ . As in the last example, we observe no long term change in satisfaction. Fixed-effects estimation compares average satisfaction levels before and after becoming self-employed. Caused by the opposite sign of anticipation and temporary effect, the difference between  $\bar{S}_1$  and  $\bar{S}_2$  is even larger here as in the case with no anticipation effect. The overestimation of the estimated effect of self-employment on satisfaction  $\Delta S_{fe}$  can thus be increased by negative anticipation effects.

**Figure 3: Fixed effects estimation with negative anticipation and full adaptation**



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

The aim of these illustrations was to show that neglecting anticipation and adaptation effects when analyzing subjective well-being measures can severely affect estimation results. The effect on estimates depends on the existence and sign of anticipation and adaptation effects. Since research on anticipation and adaptation effects shows that these effects appear for many life events (see literature review above), 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.

### 3 Data

In our analyses we used data from the German Socio-Economic Panel Study (SOEP), a nationally representative household panel which is 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 have been 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 hours preferences), job history, occupation and industry, and other firm-related characteristics. Appendix 1 gives an overview of variables and definitions used in our following 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).<sup>5</sup> For our analysis we used Stata 11.1 and the SOEP long data file.

<sup>5</sup> Further information including questionnaires and frequency tables for all items are accessible at: <http://panel.gsoep.de/soepinfo2009/>

To analyze effects caused by changes in employment status between employee status and self-employment we restrict 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 define free-lance liberal professions and other self-employed persons called entrepreneurs. Civil servants, blue-collar and white-collar workers are classified as employees. 16 individuals who stated to be self-employed as well as employees are classified as self-employed. Observations from 1996 are not included in estimations since for 1996 there is no information about working hours preference available.

To account for anticipation and adaptation effects we use lag and lead variables, which indicate if and since when an individual is self-employed (0-1 year, 1-2 years, 2-3 years, 3-4 years, 4 years or more) and if an individual is employee and will become self-employed in 0-1 year, 1-2 years, 2-3 years or 3-4 years. This implies that observations from wave 1 to 4 and 23 to 26 cannot be included in our analysis, since for these observations no full set of leading and lagged information is available. Further, we can only include individuals who reported to be either self-employed or employee in 9 consecutive years. Individuals with low employability might thus be underrepresented in our estimation sample, because they have higher probabilities of becoming unemployed and thereby drop out of our sample.

When analyzing the effect of self-employment on job satisfaction two cases have to be distinguished: start-ups and changes from self-employment to an employee job. 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 an employee job. The following analyses focus on start-ups. Individual observations after a change from self-employment to an employee job are therefore excluded from the analyses.

Additional observations could be used, if besides employees becoming self-employed also start-ups from unemployment would be considered.<sup>6</sup> We decided not to do that, because the special interest of our paper is to test if there are differences between self-employed and employees in satisfaction levels. This allows us to better compare our results to results from previous studies.

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”.

Our estimation sample includes 6,524 individuals and 37,194 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. Since fixed-effects estimation is based on intra-individual variation Table 1 shows the number of observed start-ups that could be used for estimations.

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<sup>6</sup> Binder and Coad (2012) e.g. with a matching approach found different effects on *life* satisfaction when becoming self-employed from unemployment compared to employment.

**Table 1: Number of movers from employee jobs to self-employment included in the estimation sample**

<b>self-employment</b>	<b>T-4</b>	<b>T-3</b>	<b>T-2</b>	<b>T-1</b>	<b>T</b>	<b>T+1</b>	<b>T+2</b>	<b>T+3</b>	<b>T+4+</b>
all	115	135	141	143	118	113	111	122	1.660
separated by length of self-employment									
0 to 1 year	15	23	22	22	20	.	.	.	.
1 to 2 years	5	5	11	16	7	9	.	.	.
2 to 3 years	4	6	9	9	10	8	9	.	.
3 to 4 years	2	1	2	5	4	3	2	4	.
more than 4 years	31	49	66	75	77	93	100	118	1.660

How to read the table: The sample includes 143 observations of individuals one year prior to the individuals change from an employee job to self-employment.

Source: Own calculations based on SOEP.

## 4 Empirical strategy

Empirical literature consistently found higher job satisfaction for self-employed. Most researchers assumed that the effect of self-employment is similar to the effect illustrated in Figure 1. Thus the hypothesis maintained by most authors is, that there is a permanent and positive effect of self-employment on job satisfaction. Our analysis aims to test if the hypothesis is still supported, when we account for anticipation and adaptation effects of subjective well-being.

As described above, we use job satisfaction measured on an 11-point satisfaction scale as a proxy for individual on 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 like the ordered-logit or ordered-probit model (Long 1997, McKelvey and Zavoina 1975, and recently Greene and Hensher 2010).

A second discussed topic in 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 can be doubted. 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).

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), do not only affect the dependent variable job satisfaction, but also independent variables like employment status. 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 biased. This bias is called an omitted variable bias and can also be seen as a causality problem: does self-employment increase job satisfaction or do happy people become self-employed?

### Model I without anticipation and adaptation effects

A solution to deal with the problem of inter-individual comparability and with unobserved

effects like genetic factors is to use fixed-effects regression models of the form:

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

Where  $S_{it}$  is the job satisfaction of individual  $i$  at time  $t$ .  $f_{it}$  is a dummy variable indicating if an individual at time  $t$  is self-employed ( $f_{it}=1$ ) or employee ( $f_{it}=0$ ).  $\gamma$  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. For a list of the extensive set of controls used in this paper and variable definitions see Appendix 1.  $\varepsilon_{it}$  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, like 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 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 employment. A generalisation of our results to all individuals is only allowed, 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) showed that estimates of this model are biased. Recent research using panel data thus employ 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, the assumption that subjective well-being is normally distributed. Since the POLS model is relaxing one assumption by making another assumption and Ferrer-I-Carbonell and Frijters (2004) found that differences in estimators are rather small when assuming 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  $\gamma$ , which captures the ceteris paribus difference in job satisfaction between years in self-employment and years as employee. This difference is estimated based only on those individuals, who moved between employee status and self-employment during the observation periods. As discussed above, 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 operationalisation suggested by Frijters et al. (2011) and specify model (II):

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

$f_{it,T-4}$  to  $f_{it,T+4+}$  are dummy variables indicating if an individual is self-employed, how long it is self-employed or if it 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 time of interview in year  $t$ . Otherwise  $f_{it,T}$  is 0.

Describing 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  $i$  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 a way so that only one of the dummies can be 1, all other dummies must be 0. If an individual is neither self-employed nor getting self-employed within the next four years, all dummy variables are 0. Hence the coefficients can be interpreted to the reference of those years, when an individual is employee and not getting self-employed in the coming 4 years.<sup>7</sup> For example  $\gamma_T$  is the ceteris paribus average difference in satisfaction of individuals, who are the first year self-employed, 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 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 self-employed. We will test if 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 to 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  $f_{it,T+4+}$  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 job changes 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 if there are separate anticipation and adaptation effects to 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.

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

<sup>7</sup> This includes years, when an individual changed from being self-employed to working as an employee.

For all models we will estimate two specifications: specification a, which includes no control variables and specification b, which includes a vector  $\mathbf{x}$ , which contains all controls listed in Appendix 1. This serves to test the sensitivity of the results, especially to test if changes in job satisfaction might be caused by other changes coming along with becoming self employed. This might be that self-employment involves a change of occupation or industry etc.

Table 2 summarizes all regression models, which we will present in the following Chapter.

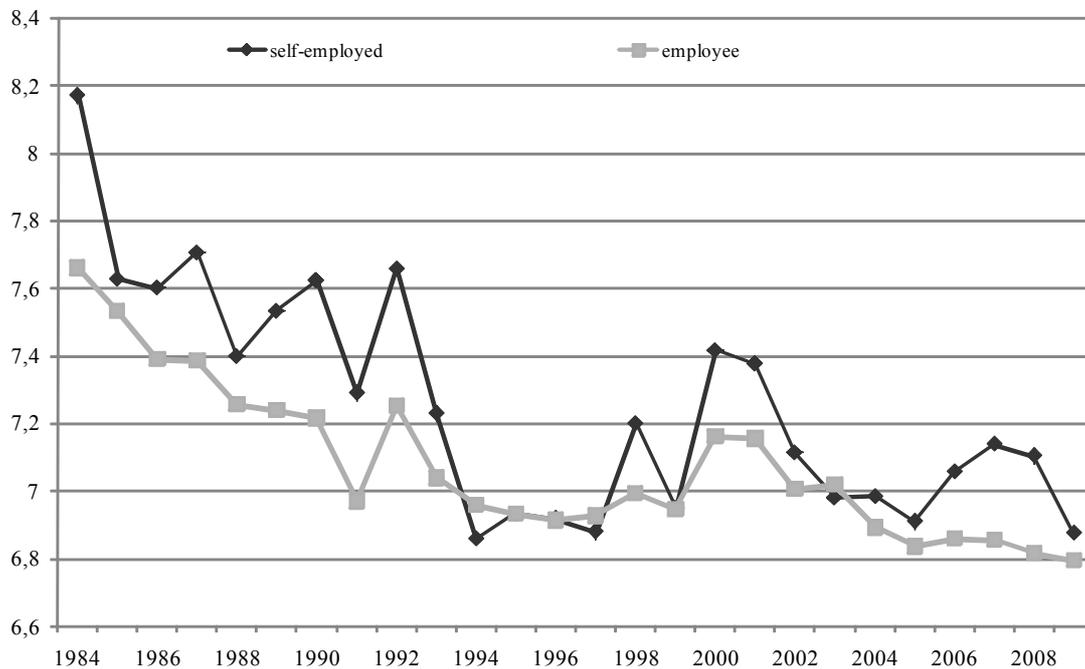
**Table 2: Overview of estimated regression models**

Model	Self-employment	Job change	Controls
Ia	dummy	–	–
Ib	dummy	–	yes
IIa	anticipation and adaptation	–	–
IIb	anticipation and adaptation	–	yes
IIIa	dummy	anticipation and adaptation	–
IIIb	dummy	anticipation and adaptation	yes
IVa	anticipation and adaptation	anticipation and adaptation	–
IVb	anticipation and adaptation	anticipation and adaptation	yes

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

## 5 Results

The job satisfaction of 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 4 average satisfaction of both subgroups follows a similar trend over time, but there are considerable differences in the gap between employee and self-employed job satisfaction. For three out of 26 years the average is slightly higher for employees.

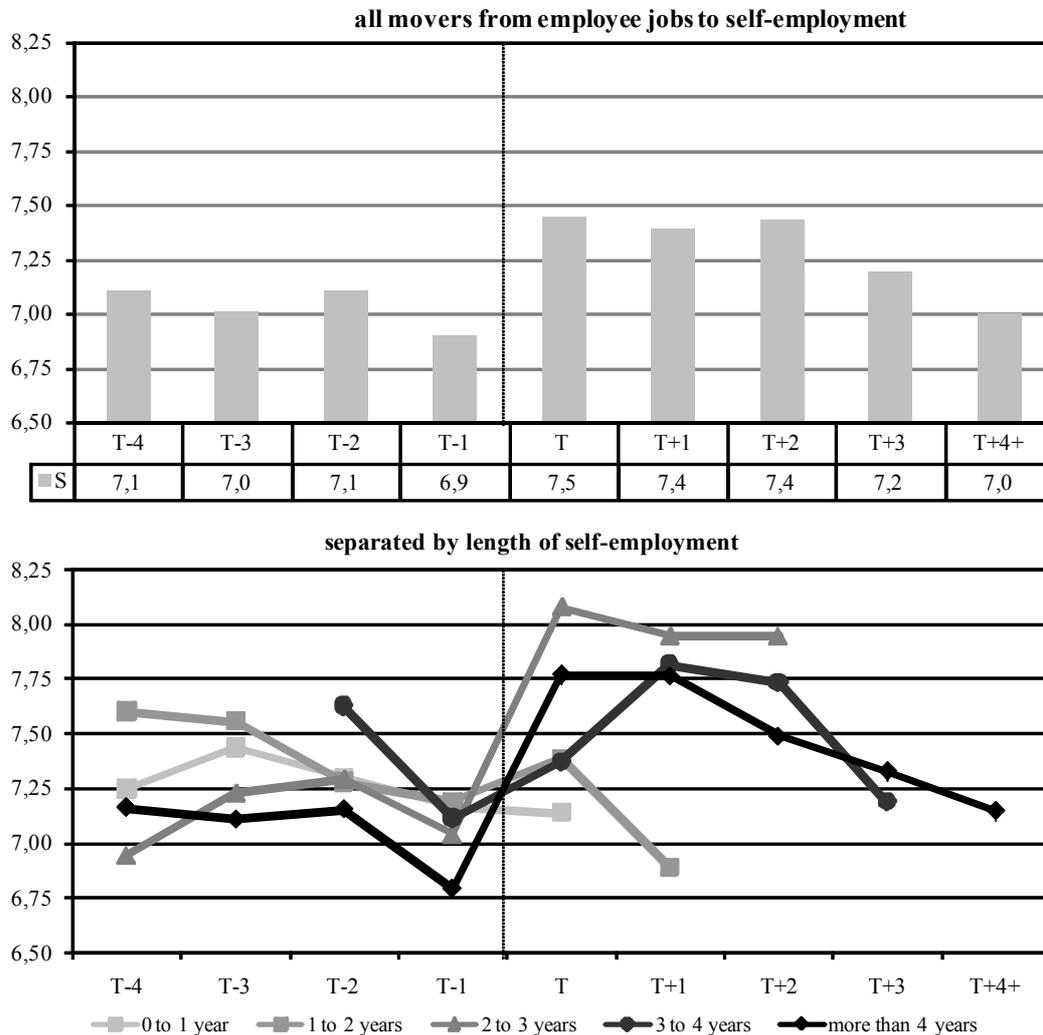
**Figure 4: Average job satisfaction of self-employed and employees in Germany 1984 to 2009**

Note: Weighted; age 16 to 64.

Source: Own calculations based on SOEP.

The following analysis is dealing with possible anticipation and adaptation effects of self-employment or job changes in general. A first impression can be received from Figure 5. The figure shows the average job satisfaction of individuals, who become self-employed within the next four years ( $T-4, \dots, T-1$ ), became self-employed within the last four years ( $T, \dots, T+3$ ) or are self-employed for more than four years ( $T+4+$ ). It can be seen that job satisfaction decreases by 0.2 points the year prior to self-employment. With the change from an employee job 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 5 shows that individuals who change back to an employee job 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 5: Average job satisfaction before and after a move from an employee job to self-employment**

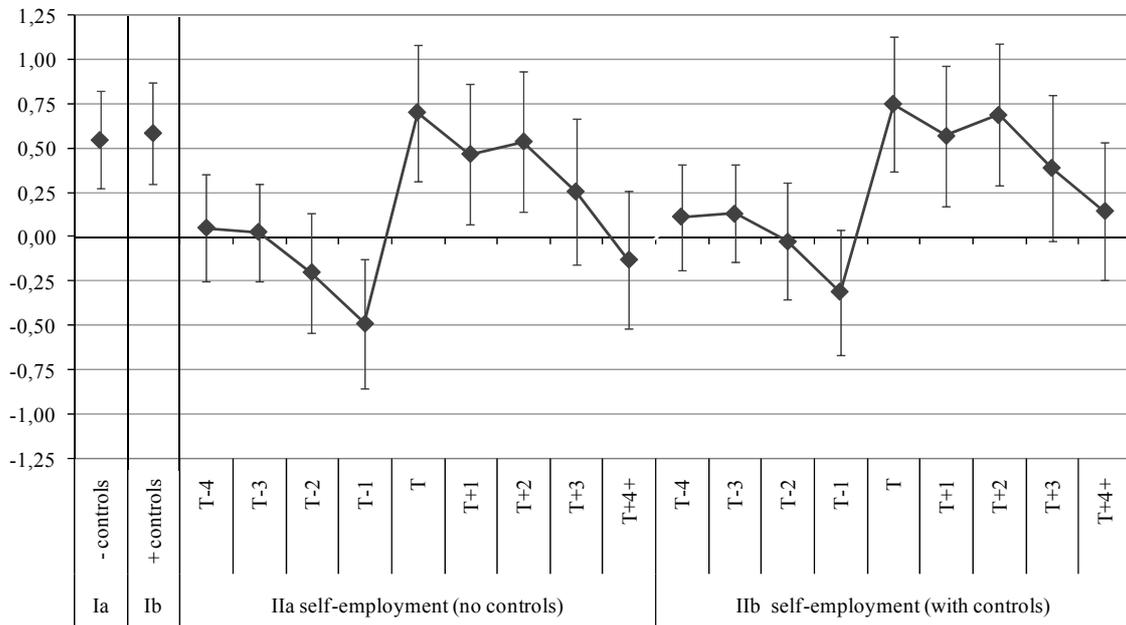


Notes: T-4: 3 to 4 prior to self-employment, ..., T: first year of self-employment, T+1: second year in self-employment, ..., T+4+: self-employed since at least 4 years; weighted; age 16 to 64.  
 Source: Own calculations based on SOEP.

**Model I without anticipation and adaptation effects**

As a first step in our analysis we estimated model Ia and Ib to reproduce the result found by several empirical studies that job satisfaction is higher for self-employed than for employees. Since we estimated only fixed-effects models, this result can be interpreted as an on average higher satisfaction level for the same individuals when being self-employed as when working as an employee. We found that the effect of self-employment amounts to approximately 0.59 points on an 11-point satisfaction scale (model Ib). The effect was found to be independent of the vector of control variables (see Figure 6 and Appendix 3). Thus the difference in satisfaction cannot be explained by differences in income, working hours, or other variables included as controls; a result which is in line with previous findings.

**Figure 6: The effect of self-employment on job satisfaction in fixed-effects models with and without accounting for anticipation and adaptation**



Source: Own illustration based on fixed-effects regression models Ia,b and IIa,b with SOEP data; 90% confidence intervals (robust standard errors); for detailed regression results see Appendix 1; for descriptive statistics on estimation sample see Appendix 2.

**Model II with anticipation and adaptation to self-employment**

To test if the effect of self-employment found in model Ia,b might be caused by anticipation and adaptation effects as discussed in Chapter 3, we estimate model IIa,b, which both include dummy variables to capture adaptation and anticipation effects to self-employment up to four years. Estimation results are shown graphically in Figure 6 and detailed in Appendix 3. As for model Ia,b the results seem to be very stable, when controlling for personal, household, and job characteristics. The coefficients of model IIa,b can be interpreted as the average difference in job satisfaction when being in self-employment for a certain number of years (adaptation) or becoming self-employed in a certain number of years (anticipation) compared to times when working as employee with no upcoming self-employment within the next four years. Hence our results indicate that individuals who will become self-employed tend to be less satisfied the year before self-employment. During the first year in self-employment, those individuals experience a remarkable upward shift in job satisfaction, which amounts to 1.06 ( $\gamma_T - \gamma_{T-1}$  in model IIb) points on average. Individuals approximately hold this satisfaction level for three years, before satisfaction drops to the baseline.

The positive effect of self-employment in our model is found to be significantly positive for three years. The 1.06 points upward shift in satisfaction only applies to a comparison of job satisfaction the year before and the year after becoming self-employed. The size of the effect is so large, because it seems that individuals are becoming increasingly dissatisfied with their work as employee the time before self-employment. On the one hand this can be due to objectively deteriorated working conditions, which induce individuals to think about becoming self-employed. On the other hand this might be due to more psychological reasons: knowing that one becomes self-employed soon, individuals do not brighten their actual work life anymore and come to a less positive evaluation of working conditions.

When analysing our results graphically in Figure 6, it becomes obvious that the change from employee status to self-employment is accompanied by large increasing negative anticipation effects and adaptation to self-employment within three years. Referring to our classification of adaptation and anticipation effects discussed in Chapter 3, here we have a situation as illustrated in case IIIc, which leads to overestimation of long term effects. This theoretically derived result fits to our empirical findings: the effect of self-employment was found to be positive when neglecting anticipation and adaptation effects, in a model with adaptation and anticipation we found only less pronounced short term and diminishing effects, which are not significant.

So far our results suggests that self-employment does not cause higher job satisfaction in the longer run, but those individuals who become self-employed improve their situation in particular in the beginning and for some time, especially because they are very dissatisfied before becoming self-employed.

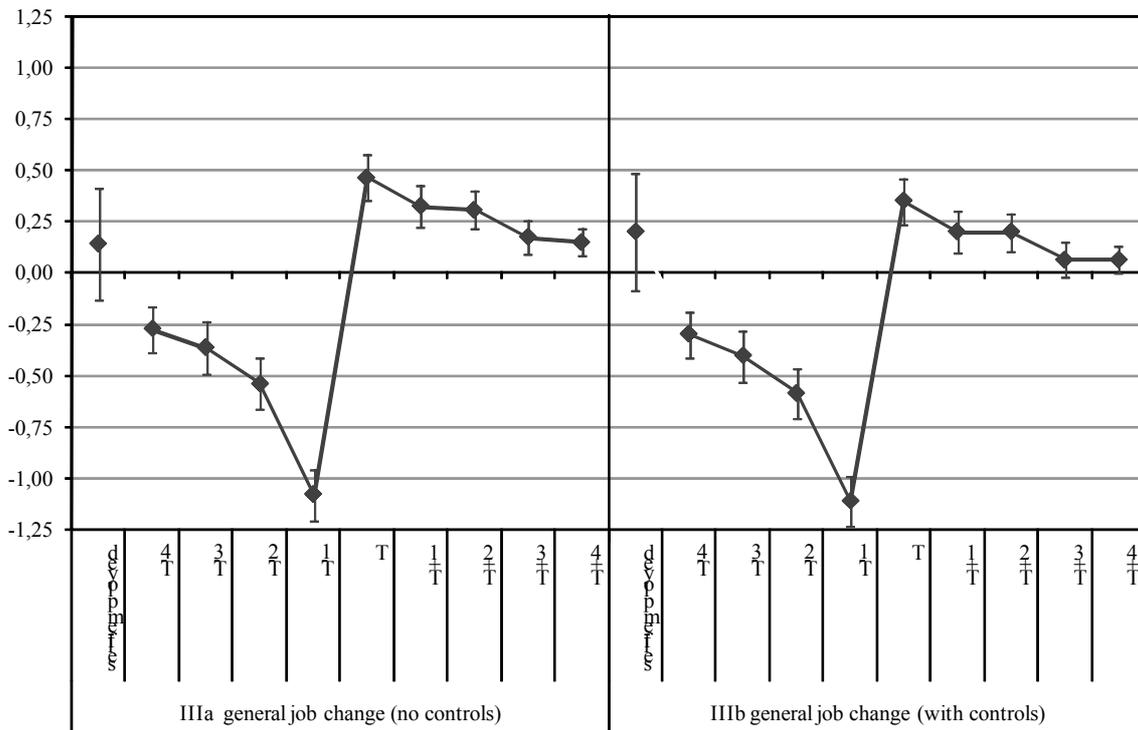
### **Model III with anticipation and adaptation for any job change**

In model IIa,b 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 if the effects estimated in IIa,b are rather general effects accompanying any change of jobs rather than a specific effect of self-employment, we estimate four more regression models. Model IIIa accounts for anticipation and adaptation to a change of jobs regardless of whether the change involves a change between being an employee or self-employed. In this setting self-employment is included in the model as a single dummy variable. Model IIIb adds a vector of controls to IIIa. Model IVa,b account 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. Whereas we found a significant difference of 0.590 points in model Ib, model IIIb estimates an approximately two thirds lower and not significant effect of 0.201 points. The anticipation effect to job changes is even more pronounced as the effect found for self-employment in IIa,b.

Thus the results support the view that most part of a higher job satisfaction of self-employed found by studies based on fixed-effects regressions can be explained by not accounting for anticipation and adaptation to job changes (see Figure 7 and Appendix 4).

**Figure 7: The effect of self-employment on job satisfaction in fixed-effects models when accounting for anticipation and adaptation to job changes**



Source: Own illustration based on fixed-effects regression models IIIa,b with SOEP data; 90% confidence intervals (robust standard errors); for detailed regression results see Appendix 1; for descriptive statistics on estimation sample see Appendix 2.

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

In model IVb (Figure 8 and Appendix 4) we account for anticipation and adaptation to job changes and self-employment. The results support the findings of IIIb: Anticipation and adaptation effects to self-employment almost disappear, when we control for anticipation and adaptation to job changes in general. However an on average positive effect of self-employment of approximately 0.15 points is found for three years after becoming self-employed, but the effect is statistically not significant.

To sum up: Our results contradict the widespread finding that self-employed individuals experience substantially higher satisfaction levels than employees. Our analysis indicates that the effect found in fixed-effects regression models can be traced back to uncovered anticipation and adaptation effects associated with job changes in general.

**Figure 8: Anticipation and adaptation to job satisfaction when accounting for anticipation and adaptation to job changes in a fixed-effects regression model**



Source: Own illustration based on fixed-effects regression model IVb with SOEP data; 90% confidence intervals (robust standard errors); for detailed regression results see Appendix 1; for descriptive statistics on estimation sample see Appendix 2.

### 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, improve their level of job satisfaction remarkably, when compared to the year before self-employment.
- Mainly this improvement can be explained by the fact that the change from employee work to being self-employed is accompanied by large and increasing negative anticipation effects.
- When controlling for anticipation and adaptation effects, which accompany every change of jobs, regardless of whether the change is connected with changing between being employee and being self-employed, no significant separate anticipation and adaptation is found for self-employment.
- Positive effects of self-employment on job satisfaction are only found for the first three years of self-employment and are not significant; individuals adapt to self-employment.

As our results show, once anticipation and adaptation is considered no longer termed differences in job satisfaction between self-employed and employees will be visible.

## 6 Discussion and Conclusion

The aim of this study was to test if higher levels of job satisfaction of 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 derived how estimates of the effect of self-employment in fixed-effects regression models might be misleading in presence of anticipation and/or adaptation effects. Our estimates showed that large negative anticipation effects precede the change from employee work to self-employment. Those individuals, who become self-employed, improve their level of job satisfaction remarkably, when compared to the year before self-employment. However in comparison to those years, when employee work is done and no self-employment is upcoming, self-employment causes only a slight increase in job satisfaction for no more than three years.

Further we estimated fixed-effects regression models, which account for anticipation and adaptation of job satisfaction to job changes independent of a change in self-employment. Our results showed that negative anticipation effects, which were found for self-employment, are a general effect preceding any change of jobs. A separate anticipation effect to self-employment was not found. The slight positive and not significant three years lasting effect of self-employment on job satisfaction was found in this model, too. In the long run we find that self-employed are not better off than employees; precisely: we cannot reject the hypothesis that job satisfaction is *ceteris paribus* the same for 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 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 higher procedural utility of self-employment, the effect is neither large nor lasting. At least our results suggest that the experience of procedural utility is not constant or other words: procedural utility is subject to adaptation effects. Further our result does 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.

The group of self-employed analysed in this paper is a very heterogeneous group. The group consists of self-employed farmers, free-lance professionals and other self-employed persons. One can imagine that working life of a self-employed farmer is quite different than working life of a free-lance professional. This variety might explain (besides the relatively small number of observations) the large variance of the estimates of self-employment on job satisfaction, when accounting for anticipation and adaptation effects. Future research could look at differences between subgroups of the self-employed like free-lancers. Furthermore, it would be interesting to see how life satisfaction or different sub domains of job satisfaction like satisfaction with pay or with hours worked respond to changes in employment status.

## 7 Appendix

### Appendix 1: Variables and definitions

Variable	Definition
<b>SELF EMPLOYMENT</b>	
(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, and is self-employed since
Self-employed T+2	Dummy; became self-employed 2-3 years ago, and is self-employed since
Self-employed T+3	Dummy; became self-employed 3-4 years ago, and is self-employed since
Self-employed T+4+	Dummy; became self-employed more than 4 ago, and is self-employed since
<b>JOB CHANGE (lags and leads)</b>	
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
<b>JOB</b>	
Job satisfaction	(Dependent variable) 11-point scale: 0= totally unhappy, 10= totally happy
ln(personal income)	ln(monthly net income (earned)€ /1000)
Experience full-time	Years of labor market experience as full-time worker
Experience part-time	Years of labor market experience as part-time worker
Experience unemployment	Years of labor market experience as unemployed
Activity is job	Activity is job
Working hours	Working hours per week
Working hours <sup>2</sup>	Working hours per week <sup>2</sup> /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

Industry	operators and assemblers; Drivers and mobile plant operators; Sales and services elementary occupations; Agricultural, fishery, and related laborers; Laborers in mining, construction, manufacturing, and transport (reference: office clerks) 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)
<b>PERSONAL</b>	
Age <sup>2</sup>	= Age in years <sup>2</sup> /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
<b>HOUSEHOLD</b>	
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)
<b>REGION</b>	
East Germany	Dummy variable
German federal states	15 dummies for German federal states: Berlin, Schleswig-Holstein; Hamburg; Bremen; Northrhine-Westphalia; Hesse; Rhinel.-Palatinate; Saarland; Baden-Wuerttemberg; Bavaria; Mecklenburg-West Pomerania; Brandenburg; Saxony-Anhalt; Thuringa; Saxony (reference: lower Saxony)
<b>YEAR</b>	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	7.131	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	0.062	0	1
T	0.003	0.056	0	1
T+1	0.003	0.055	0	1
T+2	0.003	0.055	0	1
T+3	0.003	0.057	0	1
T+4+	0.045	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	0.184	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	0.197	0	1
T+4	0.056	0.230	0	1

	Mean	Std.dev.	Min.	Max.
<b>JOB</b>				
net income (earned)/1000	7.213	0.528	3.22	9.74
experience (full-time, years)	17.929	9.491	0	47
experience (part-time, years)	1.924	4.504	0	41
experience (unemployment, years)	0.282	0.885	0	24
activity is job	0.587	0.492	0	1
working hours/week	40.564	10.055	0.5	80
working hours <sup>2</sup> /100	17.465	8.181	0.00	64
prefers to work # hours less	5.124	7.011	0	70
prefers to work # hours more	0.801	3.165	0	51
part-time	0.101	0.302	0	1
liberal profession	0.015	0.121	0	1

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

	Ia	Ib	IIa	IIb
<b>SELF-EMPLOYMENT</b>				
Self-employed (dummy)	0.552*** (3.32)	0.590*** (3.40)		
Self-employed				
T-4			0.053 (0.29)	0.115 (0.63)
T-3			0.028 (0.17)	0.137 (0.83)
T-2			-0.198 (-0.97)	-0.021 (-0.10)
T-1			-0.484 (-2.18)*	-0.307 (-1.43)
T			0.704** (3.01)	0.752** (3.27)
T+1			0.468+ (1.95)	0.575* (2.40)
T+2			0.538* (2.23)	0.691** (2.84)
T+3			0.257 (1.03)	0.391 (1.55)
T+4 or more			-0.127 (-0.54)	0.147 (0.63)
<b>JOB</b>				
net income (earned)/1000		0.516*** (7.78)		0.519*** (7.84)
experience (full-time, years)		-0.115 (-1.28)		-0.115 (-1.28)
experience (part-time, years)		-0.099 (-1.09)		-0.010 (-1.10)
experience (unemployment, years)		0.322 (1.64)		0.318 (1.62)
activity is job		0.026 (0.66)		0.027 (0.69)
working hours/week		-0.010 (-1.14)		-0.010 (-1.11)
working hours <sup>2</sup> /100		0.015 (1.54)		0.015 (1.51)

prefers to work # hours less		-0.013 <sup>***</sup>		-0.013 <sup>***</sup>
		(-6.21)		(-6.20)
prefers to work # hours more		-0.018 <sup>***</sup>		-0.018 <sup>***</sup>
		(-4.52)		(-4.52)
part-time		0.058		0.060
		(0.66)		(0.69)
liberal professions		0.206		0.202
		(1.39)		(1.37)
<b>CONTROLS</b>				
(for details see Appendix 1)				
occupation and industry		✓		✓
person and household		✓		✓
region		✓		✓
years		✓		✓
R <sup>2</sup> within	0.0008	0.0277	0.0022	0.0286
max. observations/individual	17	17	17	17
average observations/ind.	5.701	5.701	5.701	5.701
individuals	6.524	6.524	6.524	6.524
observations	37.194	37.194	37.194	37.194

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.

Source: Own calculations based on SOEP 1984-2009.

**Appendix 4: Fixed-effects regression results – The effect of job changes and self-employment on job satisfaction when accounting for anticipation and adaptation effects**

	IIIa	IIIb	IVa	IVb
<b>JOB CHANGE</b>				
(lead and lag variables)				
T-4	-0.276*** (-3.97)	-0.302*** (-4.37)	-0.290*** (-4.07)	-0.318*** (-4.49)
T-3	-0.365*** (-4.68)	-0.407*** (-5.32)	-0.387*** (-4.83)	-0.436*** (-5.54)
T-2	-0.541*** (-7.16)	-0.587*** (-7.90)	-0.553*** (-7.08)	-0.610*** (-7.96)
T-1	-1.081*** (-14.13)	-1.111*** (-14.89)	-1.095*** (-14.11)	-1.135*** (-14.98)
T	0.465*** (6.93)	0.349*** (5.20)	0.433*** (6.32)	0.323*** (4.73)
T+1	0.324*** (5.26)	0.199** (3.23)	0.301*** (4.75)	0.179** (2.84)
T+2	0.307*** (5.56)	0.198*** (3.57)	0.279*** (4.93)	0.172** (3.02)
T+3	0.172*** (3.42)	0.064 (1.27)	0.157** (3.08)	0.051 (0.99)
T+4	0.150*** (3.84)	0.064 (1.62)	0.149*** (3.83)	0.064 (1.62)
<b>SELF-EMPLOYMENT</b>				
Self-employed (dummy)	0.139 (0.84)	0.201 (1.16)		
Self-employed				
T-4			0.184 (0.98)	0.259 (1.40)
T-3			0.239 (1.37)	0.385* (2.24)
T-2			0.148 (0.71)	0.370+ (1.80)
T-1			0.198 (0.88)	0.411+ (1.89)
T			0.531* (2.24)	0.656** (2.82)
T+1			0.330 (1.36)	0.518* (2.15)
T+2			0.429+ (1.75)	0.660** (2.70)
T+3			0.247 (0.98)	0.459+ (1.83)
T+4 or more			-0.015 (-0.06)	0.271 (1.16)
<b>JOB</b>				
net income (earned)/1000		0.459*** (7.13)		0.459*** (7.14)
experience (full-time. years)		-0.110 (-1.23)		-0.112 (-1.25)
experience (part-time. years)		-0.094 (-1.04)		-0.097 (-1.07)
experience (unemployment. years)		0.058 (0.32)		0.051 (0.28)
activity is job		0.039		0.040

	IIIa	IIIb	IVa	IVb
working hours/week		(1.02)		(1.05)
		-0.010		-0.010
		(-1.21)		(-1.18)
working hours <sup>2</sup> /100		0.015		0.015
		(1.59)		(1.56)
prefers to work # hours less		-0.013 <sup>***</sup>		-0.013 <sup>***</sup>
		(-6.31)		(-6.28)
prefers to work # hours more		-0.018 <sup>***</sup>		-0.018 <sup>***</sup>
		(-4.53)		(-4.54)
part-time		0.060		0.061
		(0.70)		(0.72)
liberal professions		0.240 <sup>+</sup>		0.249 <sup>+</sup>
		(1.65)		(1.72)
<b>CONTROLS</b>				
(for details see Appendix 1)				
occupation and industry		✓		✓
person and household		✓		✓
region		✓		✓
years		✓		✓
R <sup>2</sup> within	0.0242	0.0487	0.0247	0.0492
max. observations/individual	17	17	17	17
average observations/ind.	5.701	5.701	5.701	5.701
individuals	6.524	6.524	6.524	6.524
observations	37.194	37.194	37.194	37.194

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.

Source: Own calculations based on SOEP 1984-2009.

## 8 References

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