

Auer, Wolfgang

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Health Consequences of Starting a Career on a Fixed-Term Contract

Preliminary and Incomplete—Please Do Not Cite

Wolfgang Auer
*Ludwig Maximilian University of Munich and
Ifo Institute, Munich*

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Abstract

I study the short- to medium-run effects on subsequent health outcomes of starting a career on a fixed-term contract. I focus on career start since I expect that temporary contracts and their inherent economic uncertainty imply a path dependence that might have spill-over effects on other domains of life. The empirical analysis is based on rich data from the German Socio-Economic Panel, which provides comprehensive information about individuals' labor market history as well as health conditions. My main results are the following. (i) Women react to fixed-term employment at the beginning of their career by experiencing worse mental health in the short run. This relationship is driven by the subjective perception of stress and pressure in these jobs, fades out over time, and is strongest in the sample of women with secondary education. (ii) Women's physical health is not affected at all. (iii) Economic uncertainty due to fixed-term employment has no future consequences for men's mental or physical health. I argue that these findings are robust to several sensitivity tests as well as to potential endogeneity threats.

Keywords: Career start, fixed-term employment, general and mental health, life satisfaction

JEL codes: I12, I31, J41

Contact details: Wolfgang Auer (auer@ifo.de), ifo Institute, Munich, Poschingerstr. 5, 81679 Munich, Germany.

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1. Introduction

One of the most striking facts about the labor market development of many European countries is the tremendous increase in the prevalence of fixed-term employment over the last decades. By 2012, the average share of temporary¹ employees among all 25- to 54-year-old employees was around 12 percent in Europe.² Germany has witnessed a particularly strong rise in fixed-term employment in recent years. By 2012, almost 50 percent of new employment contracts were of limited duration. As a consequence, fixed-term employment is particularly concentrated among young adults in their early careers—a period in life that is crucial for career progression.³ Recent evidence shows that adverse labor market conditions at the beginning of the career can lead to severe and persistent earning losses (e.g., Oreopoulos, von Wachter, and Heisz 2012). Temporary employment might cause a similarly negative labor market path dependence via repeated episodes of temporary employment, decelerated wage progression, and higher likelihood of future unemployment (Hagen 2002; Bruno, Caroleo, and Dessy 2012; Booth, Francesconi, and Frank 2002; Pavlopoulos 2009).

Previous studies mainly link contemporaneous temporary employment and health responses at different stages of the lifecycle and have produced mixed evidence. Their approach neglects the potential endogeneity of fixed-term contracts as well as any path dependence. The empirical literature on whether and, if so, how increased levels of economic uncertainty due to unstable working contracts at the beginning of a career have spill-over effects on other domains of life is rare. The main objective and contribution of this paper is to fill this gap by empirically assessing the implications for subsequent physical and mental health outcomes of *entering* the labor market on a fixed-term contract.

¹ Throughout this paper, the terms fixed-term contract and temporary contract are used interchangeably.

² The numbers refer to all European OECD countries (OECD 2014).

³ For instance, while almost every fifth female worker in the age group 25 to 29 holds a fixed-term contract, this is only true for 9 percent of those aged 35 to 39.

From a theoretical perspective, the effect of fixed-term employment on health is not clear a priori. First, lower opportunity costs might allow individuals to devote more time to healthy behavior and therefore induce better health outcomes (Grossman 1972). On the other hand, higher levels of stress, uncertainty, and financial instability might negatively affect mental health and health investments. Empirically, I focus on several cohorts of graduates from vocational training or tertiary education and follow them up to five years after entering the labor market. I analyze the effects of starting a career with a fixed-term contract on subsequent health outcomes in the short run. Another contribution of this paper is to carefully discuss and address the potential endogeneity due to path dependence of starting a career with a fixed-term contract. To reduce possible omitted variable bias, I exploit rich and unique data set and include a large set of new control variables (e.g., personality traits, attitudes, family background, and ex-ante health status).

Based on the survey years 1996 to 2012 of the German Socio-Economic Panel (SOEP), my results for women confirm that starting a career with a fixed-term contract is negatively associated with subsequent health outcomes. My analyses show that women tend to have lower mental health conditions, but only in the short run. Physical health outcomes for women, as well as the health status of men, are not affected by the type of contract held at the beginning of the career. As health status, as well as holding a fixed-term contract, may be driven by unobserved heterogeneity, I address potential endogeneity concerns on two fronts: first by including many important and previously neglected control variables and, second, by showing that entering the labor market on a fixed-term contract is related neither to family nor to career preferences. Due to data constraints, I am not able to examine the effect on health outcomes for a longer time horizon than the first five years of a career. However, since the effects vanish rapidly after labor market entry, I do not expect that there are any long-run health consequences of starting a career on a fixed-term contract.

In general, this research contributes to the growing literature on the relationship between economic uncertainty and health. Several empirical studies focus on aggregate unemployment and how it affects mortality rates (see, e.g., Ruhm 2000, 2003, 2005). Mortality rates seem to follow a pro-cyclical pattern at the state level, which is surprising since it suggests an adverse health effect of reduced unemployment rates. On the individual level, the relationship seems to be reversed. For instance, Sullivan and von Wachter (2009) show a particularly pronounced increase in the annual probability of dying immediately after job loss. Theodossiou and Vasilidou (2007) find that the effect of perceived risk of job loss on job satisfaction is significantly negative and large.

Temporary employment is considered to be one particular form of economic uncertainty. Unfortunately, evidence on the relationship between fixed-term employment and health is scarce and inconclusive. Several studies find negative effects of fixed-term employment on job satisfaction (e.g., Booth, Francesconi, and Frank 2002; Chadi and Hetschko 2013), but show that this does not translate into lower well-being (Dawson and Veliziotis 2013) or worse health status (Bardasi and Francesconi 2004). In the study most similar to my research, Rodriguez (2002) analyzes British and German micro data and finds that German workers with fixed-term contracts have a significantly higher probability of reporting worse health than their permanently employed colleagues. In contrast, the effect of fixed-term employment is not significant among British workers, a finding in line with the results of Bardasi and Francesconi (2004) for the United Kingdom. All these studies have in common that they focus mostly on empirical associations between holding a fixed-term contract and health outcomes. They neither consider the potential endogeneity problems nor the potential path dependence of entering the labor market with a contract with limited duration.

The remainder of the paper is organized as follows. The next section introduces the data and the empirical approach. The main results as well as several sensitivity and subgroup analyses are presented in Section 3. Section 4 concludes.

2. Data and Empirical Strategy

2.1 Data, Sample Restrictions, and Variables

I employ the German Socio-Economic Panel (SOEP), which has provided annual and nationally representative panel data since 1984 (Wagner, Frick, and Schupp 2007). In 2012, the SOEP covered more than 20,000 individuals living in over 12,000 households. SOEP contains detailed information on a variety of individual as well as household-specific socioeconomic characteristics. Moreover, the respondents provide information about their labor market history as well as their current labor force status. Most importantly, I know when the individuals finished their education and entered the labor market and whether their first employment contract was permanent or temporary. I focus on the waves 1995 to 2012 since consistent information on the type of employment contract for all working individuals was collected only from 1995 onward.⁴ The questions regarding life and health satisfaction are available for the whole observation period. Since the health questions have been part of the questionnaire since 2002, but only every second year, I am not able to look at the same sample period as for the satisfaction analysis. In the analysis of health consequences, in order to make the sample more homogenous, I restrict the sample to women and men who entered the labor market with their highest degree before their 36th birthday and have at least a secondary school degree. In the robustness checks I show that my results are not sensitive to the choice of the age-at-graduation cutoff. By restricting the sample to men and women who answer the questionnaire in five subsequent years after their labor market entry, I obtain a balanced sample. The sample for the health (satisfaction) analysis comprises 226 (601) women and 185 (546) men from the graduation cohorts 2002 to 2007.

⁴ Respondents who did not report a job change were excluded from this question. Thus, switching from temporary to permanent employment at the same employer was not part of the questionnaire up to 1995.

To measure the health status of the individuals in the sample, I use various outcome variables. First, the SOEP data provide an overall measure of mental and physical health.⁵ Since this measure is not available every year, I fill in the gaps in the main analysis: assuming a linear development of health status over time, I use the average value of the health measure between two observations. On the one hand, this means an increased number of observations and thus more precise estimates. On the other hand, the linearity assumption might be too restrictive and in some cases inappropriate and misleading.⁶ The obtained index is standardized to mean 50 and a standard deviation of 10. Second, the data also contain information on each of the subcategories of the health indices, which I use in a refinement of the analysis. Third, I use self-rated information about satisfaction with life and health status. Although these variables are measured on a scale from 0 (worst outcome) to 10 (best outcome), I assume continuity and do not further manipulate the scales.

The main explanatory variable is a binary variable indicating whether the first job after graduation had a fixed-term employment contract or a permanent contract. Since I also control for whether the respondent is unemployed after graduation, the reference group is an employee with a permanent contract.⁷ A great advantage of the SOEP data is the variety of unique information about the respondents. The data allow me to include a large set of controls for individual, background, personality, and first job characteristics, as well as partnership status at labor market entry and ex-ante health status. All control variables are either predetermined (i.e., determined before labor market entry) or measured in the year of or before career start.

⁵ For more detail on how the cardinal measures for mental and physical health are constructed from the survey items, see Andersen et al. (2007).

⁶ For example, if I do not observe type of first contract and health status at the same time, the linearity assumption could potentially cause a change in the health status by construction instead of being due to the type of the first contract. This would cause an under- or overestimation of the true relationship. I deal with this problem in the sensitivity analyses.

⁷ I use the expressions “year of graduation” and “year of labor market entry” interchangeably even though, technically speaking, I measure the information on the first job in the calendar year after graduation. The main reason for doing so is that I do not have information on the exact date of graduation. This approach ensures that the job information is indeed measured after graduation.

Individual control variables are age at graduation, years of education, a dummy variable for migratory background, and being born in East Germany. As a proxy for the respondent's pre-determined family background I include variables indicating whether his or her mother has tertiary education, whether the mother was employed when she was 15 years old, whether the respondent has siblings and his or her mother's age at the respondent's birth. Personality traits and self-reported attitudes are captured by the "Big 5" and Kluckhohn's importance of life areas. More precisely, five variables reflect the respondent's openness to new experience, agreeableness, conscientiousness, extraversion, and neuroticism. Four binary variables indicate individual career and family-related attitudes. They take on the value 1 if a woman claims that having children, being in a happy partnership/marriage, the ability to afford something or having a career is important or very important in her life.⁸ In addition, a dummy variable indicates whether an individual is risk averse, that is, reports a (very) low subjective willingness to take risks. My last measure of personality is locus of control, where higher values imply a higher level of internal locus of control. As regards the characteristics of the first job, I include only very rough indicators, namely, dummy variables for blue- versus white-collar occupations and five industry dummies for the main economic sectors.⁹ To allow for different health conditions before entering the labor market, I add indicators for baseline health conditions (pre-graduation), such as the number of doctor visits and days in the hospital before labor market entry. In addition, I control for the health status before entering the labor market. This is comparable to a lagged dependent variable approach and equalizes the baseline health

⁸ Questions on personality traits and attitudes are not included in every wave of the survey. However, in order to exclude possible feedback effects of personal labor market or partnership experience on personality traits and family and career attitudes, I only use the first available observation. The majority of women answer this question around the age of 21 or younger.

⁹ The five main industries are generated according to the classification of the Federal Statistical Office (destatis). These are manufacturing, construction, trade and transportation, financial services, and public and other services. I dropped the only female respondent working in the agricultural sector and three women in the construction sector. The prevalence of fixed-term employment differs across industries and occupational groups. Similarly, women and men with particular health conditions might self-select into particular industries and occupational groups. By controlling for these job characteristics I want to make sure that my results do not reflect spurious correlations between temporary jobs and (mental) health.

of all observed individuals. Finally, I include a dummy variable indicating whether the person is in a partnership at career start as well as the number of children he or she has right at the beginning of the career.

Table 1 Development of outcome variables by type of contract and employment status

	First Job Permanent Contract			First Job Fixed-Term Contract			Unemployed After Graduation		
	Mean	SD	N	Mean	SD	N	Mean	SD	N
(I) Women									
Mental health after 2 years	49.23	8.227	144	47.16	7.292	80	49.60	8.096	59
Mental health after 3 years	49.48	8.001	144	47.29	7.590	80	49.46	9.067	59
Mental health after 4 years	49.30	8.009	144	47.67	8.436	80	49.57	8.048	59
Mental health after 5 years	48.62	8.889	144	46.80	9.277	80	48.96	9.467	59
Physical health after 2 years	55.93	6.071	144	55.77	5.990	80	55.96	5.895	59
Physical health after 3 years	55.69	6.548	144	55.79	6.340	80	55.76	6.582	59
Physical health after 4 years	55.46	6.988	144	55.22	5.684	80	54.96	6.257	59
Physical health after 5 years	55.21	7.236	144	55.05	5.562	80	54.73	6.100	59
(II) Men									
Mental health after 2 years	51.72	7.579	147	50.44	8.103	45	49.73	7.684	41
Mental health after 3 years	50.81	7.589	147	51.44	7.502	45	47.60	10.62	41
Mental health after 4 years	50.41	7.712	147	51.20	7.005	45	48.48	9.126	41
Mental health after 5 years	49.98	8.399	147	51.06	6.719	45	48.80	10.50	41
Physical health after 2 years	55.84	6.000	147	56.53	4.979	45	55.75	6.555	41
Physical health after 3 years	56.00	5.088	147	56.26	4.447	45	55.47	7.188	41
Physical health after 4 years	56.01	4.888	147	56.50	4.061	45	55.16	7.151	41
Physical health after 5 years	55.86	5.482	147	56.22	4.961	45	54.43	6.792	41

Note: Main health sample includes all women/men with at least secondary education, younger than 36 years old at labor market entry.

Table 1 contains summary statistics of the two main health measures by type of first job contract and employment status after graduation, respectively. The standard deviation is, on average, smaller when I split the sample by gender and year since graduation because the subsamples are probably more homogenous than the pooled sample. While physical health conditions are not different for either men or women, the mental health of women is slightly worse in the first years after labor market entry. By Year 5 on the labor market, however, even this difference vanishes. In contrast, men's mental health does not appear to be dependent on the type of first job contract.

2.2 Empirical Strategy

I examine the health effects of starting a career with a fixed-term contract more thoroughly in a regression framework. The basic empirical strategy is to compare women and men entering the labor market on fixed-term contracts with their counterparts on permanent contracts in terms of short- to medium-run health outcomes. The empirical setup is comparable to that used in papers studying future effects of adverse labor market conditions at the beginning of a career (see, e.g., Kahn 2010; Liu, Salvanes, and Sørensen 2012; Stevens 2007). I take advantage of the fact that fixed-term employment increased tremendously over the last 15 years but not all regions or industries were equally affected. Thus, a substantial part of the variation in starting a career with a fixed-term contract is caused by this exogenous, labor-demand-driven increase in temporary employment. The underlying empirical model can be described in a very simple linear regression form as follows:

$$Y_{it_0+z} = \alpha Y_{it_0-1} + \beta FT_{it_0} + \gamma UE_{it_0} + \delta' X_{it_0} + \varphi_{st_0} + \mu_{t_0} + \varepsilon_{it_0} \quad (1)$$

Y_{it_0+z} denotes the outcome of interest for individual i in period $t_0 + z$, where z indicates the year after graduation or end of vocational training. I add a lagged dependent variable (Y_{it_0-1}), namely, health status in the year before labor market entry. In so doing, I intend to make the changes in health status due to a fixed-term contract more comparable across population subgroups. Since the original data provide bi-yearly information only, I use health status either one or two years before labor market entry. This allows me to avoid biased estimates due to the linearity assumption. FT_{it_0} is an indicator variable for starting a career with a fixed-term contract and UE_{it_0} indicates whether an individual experienced an unemployment spell after graduation. Therefore, the base category in my regressions will be starting a career with a permanent contract. Further, X_{it_0} are observed predetermined individual and job characteristics measured in t_0 , φ_{st_0} is the federal state of the first job, μ_{t_0} is year of graduation, and ε_{it_0} is the unobserved error term.

It is crucial to include variables that influence the probability of holding a fixed-term contract and might simultaneously correlate with ex-ante health conditions. Not controlling for these variables may leave them in the error term as confounding factors, which may cause spurious correlations between health and holding a fixed-term contract at labor market entry. If workers with particular characteristics self-select into particular types of contracts, the estimates would be biased. This aspect has been mainly ignored in previous studies analyzing the role of fixed-term employment on health outcomes. I discuss this issue in detail in Section 3.2. Summing up, I cannot claim to identify the causal effect of initial fixed-term employment on subsequent health outcomes as I lack truly exogenous variation in temporary contracts. However, controlling for a large set of traits and attitudes and given the insignificance of predetermined characteristics for working under a specific type of contract, I believe that my results are robustly estimated associations. I run separate regressions for all outcome variables using standard OLS techniques to estimate the association between starting a career with a fixed-term contract and subsequent health conditions. I use robust standard errors to account for potential heteroscedasticity.

3. Results

3.1 Results for the Main Regression Sample

The estimated coefficients of starting a career with a fixed-term contract in Equation (1) are reported in Table 2 for the main indices of mental and physical health. The results illustrate that physical health is not affected by the type of first contract. However, women's mental health appears to react to spells of temporary employment at the beginning of the career; women report significantly worse mental health, at least in the short run. While on the first job or during the first years of their careers, economic uncertainty seems to depress the mental well-being of women. However, as soon as four years after labor market entry, the association becomes insignificant. In contrast, there is no significant association between starting a career with a fixed-term contract and mental or physical health for men.

Table 2 Starting a career with a fixed-term contract and subsequent mental and physical health

Dependent Variable	Mental Health		Physical Health	
	(I) Women	(II) Men	(III) Women	(IV) Men
At labor market entry (1 st year)	-0.877 (1.257)	1.503 (1.395)	0.767 (0.810)	-0.439 (1.339)
2 nd year on the labor market	-3.242** (1.337)	1.043 (1.658)	1.143 (1.134)	-1.381 (1.499)
3 rd year on the labor market	-4.261*** (1.370)	1.569 (1.514)	0.480 (1.260)	-1.076 (1.101)
4 th year on the labor market	-1.421 (1.731)	1.004 (1.694)	0.215 (1.309)	0.221 (1.067)
5 th year on the labor market	0.304 (1.675)	1.643 (1.523)	0.907 (1.119)	-0.286 (1.228)
<i>N</i>	226	185	226	185
<i>Baseline test: before labor market entry</i>	0.467 (1.835)	-3.740* (2.016)	1.396 (1.037)	0.942 (1.119)

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; dependent variables filled by linear trend; all regressions contain controls for individual characteristics, background characteristics, job characteristics, personality traits and attitudes, partnership status, ex-ante health status, federal-state-of-first-job dummies, and year-of-graduation dummies.

As a robustness check and to test for possible endogenous selection into fixed-term employment, I repeat the same analysis using the ex-ante health status as the dependent variable (see last row of Table 2).¹⁰ Before entering the labor market women do not differ in their health status depending on the type of their (future) contract. This result makes me confident that women do not select into fixed-term contracts based on pre-career health status. The significant coefficient in the male sample could indicate potential selection of men with poor mental health into fixed-term contracts.

The way SOEP provides health information allows me to have a closer look at the subcategories of the mental health index. The four categories are: 1. “Mental health,” which is low if respondents have experienced time pressure or have felt depressed in the last four weeks. 2. “Vitality” is high if respondents have felt calm and peaceful. 3. “Social function” is high if respondents have not experienced limitations of social contacts due to mental or physical

¹⁰ In these robustness checks I do not include the ex-ante health conditions as an explanatory variable (lagged dependent variable) as I do in the main health regression.

health problems. 4. “Role emotional” is a variable that attains a low value if the respondent accomplished less and felt limited in work or other activities due to mental and emotional problems. Table 3 reports the coefficients of starting a career with a fixed-term contract at different stages after labor market entry for the subsample of women. As regards mental health and vitality, the same pattern as for the overall measure emerges. Directly at the beginning of the career, mental health is not affected, but in the subsequent two years, women appear to suffer from economic uncertainty. As they advance in their career, however, the negative relationship fades. The reason for the poorer mental condition of women is that they feel more often depressed and under time pressure and less often calm and peaceful. According to that finding, the economic uncertainty associated with fixed-term contracts is obviously detrimental for women’s mental condition. In contrast, I find no significant coefficients in the male sample (Table 4). The only exception is the positive (and contemporaneous) correlation with social functioning. The baseline test for men again suggests potential differences in health status before labor market entry, at least in Columns I and II.

Table 3 Marginal effects of starting a career with a fixed-term contract on subcategories of mental health for women

Dependent Variable	Mental Health	Vitality	Social Functioning	Role Emotional
	(I)	(II)	(III)	(IV)
At labor market entry (1 st year)	-1.171 (1.098)	-0.692 (1.046)	-0.287 (1.257)	0.228 (1.145)
2 nd year on the labor market	-2.520* (1.419)	-4.384*** (1.281)	-1.875 (1.266)	-0.738 (1.345)
3 rd year on the labor market	-4.300*** (1.369)	-4.784*** (1.506)	-1.772 (1.331)	-2.188 (1.458)
4 th year on the labor market	-2.528 (1.605)	-1.510 (1.922)	0.383 (1.823)	-0.579 (1.586)
5 th year on the labor market	-0.404 (1.639)	0.077 (1.800)	0.968 (1.528)	1.273 (1.516)
<i>N</i>	226	185	226	185
<i>Baseline test: before labor market entry</i>	0.175 (1.791)	-0.467 (1.865)	1.855 (1.688)	1.033 (1.819)

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; female sample; all regressions contain controls for individual characteristics, background characteristics, job characteristics, personality traits and attitudes, partnership status, ex-ante health status, federal-state-of-first-job dummies, and year-of-graduation dummies.

Table 4 Marginal effects of starting a career with a fixed-term contract on subcategories of mental health for men

Dependent Variable	Mental Health	Vitality	Social Functioning	Role Emotional
	(I)	(II)	(III)	(IV)
At labor market entry (1 st year)	0.607 (1.328)	-1.424 (1.173)	2.724** (1.343)	1.314 (1.362)
2 nd year on the labor market	0.920 (1.789)	-1.761 (1.619)	0.399 (1.871)	1.093 (1.467)
3 rd year on the labor market	2.562 (1.592)	0.796 (2.003)	-0.425 (1.755)	-0.107 (1.322)
4 th year on the labor market	1.810 (1.764)	0.314 (2.205)	0.317 (1.510)	-1.013 (1.627)
5 th year on the labor market	1.836 (1.799)	-0.487 (1.966)	0.871 (1.266)	0.000 (1.384)
<i>N</i>	226	185	226	185
<i>Baseline test: before labor market entry</i>	-3.758* (2.222)	-3.334* (1.982)	-2.255 (1.498)	-0.901 (1.683)

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; male sample; all regressions contain controls for individual characteristics, background characteristics, job characteristics, personality traits and attitudes, partnership status, ex-ante health status, federal-state-of-first-job dummies, and year-of-graduation dummies.

Next, let's turn our attention to slightly different measures of well-being. Life and health satisfaction are the dependent variables in Table 5. Both men and women are less satisfied with their lives when they enter the labor market with a temporary instead of a permanent job. However, this negative relationship holds only at the time of entering the labor market and becomes negligible and insignificant as soon as one year later. Turning to the second subjective measure of well-being, my results suggest no significant differences in reported health satisfaction between individuals starting their career on a fixed-term versus permanent contract. A bit puzzling is the large positive coefficient in Column III: women seem to report significantly higher satisfaction with their health status after five years when they started their career on a fixed-term contract. One possible explanation is that these women also have a lower propensity to have children, which might in turn improve health and satisfaction (see Kohler, Behrman, and Skyttthe 2005).

Table 5 Marginal effects of starting a career with a fixed-term contract on life and health satisfaction (OLS)

Dependent Variable	Life Satisfaction		Health Satisfaction	
	(I)	(II)	(III)	(IV)
	Women	Men	Women	Men
At labor market entry (1 st year)	-0.326** (0.149)	-0.337* (0.175)	-0.038 (0.200)	-0.069 (0.178)
2 nd year on the labor market	-0.007 (0.153)	-0.205 (0.182)	0.162 (0.165)	0.109 (0.200)
3 rd year on the labor market	-0.117 (0.151)	-0.187 (0.155)	0.285 (0.174)	-0.226 (0.189)
4 th year on the labor market	-0.160 (0.169)	-0.083 (0.162)	0.201 (0.187)	0.228 (0.190)
5 th year on the labor market	-0.112 (0.158)	-0.045 (0.156)	0.527*** (0.185)	-0.100 (0.199)
<i>N</i>	601	546	601	546
<i>Baseline test: before labor market entry</i>	-0.106 (0.153)	-0.182 (0.201)	-0.237 (0.185)	-0.109 (0.192)

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; all regressions contain controls for individual characteristics, background characteristics, job characteristics, personality traits and attitudes, partnership status, ex-ante health status, federal-state-of-first-job dummies, and year-of-graduation dummies.

3.2 Sensitivity Analysis

In this section I investigate to what extent my results on mental health are driven by the sample restrictions and the linearity assumption. First, I run the same regressions as in the previous analyses, but omit the linearity assumption. Therefore, I make use of the original data, which contain health information only bi-yearly (Table 6). Second, I relax the sample restriction by changing the age-at-graduation cutoff (Table 7) as well as by including men and women with elementary education (Table 8). Finally, I discuss the potential selection issue (Table 9).

Table 6 discusses the sensitivity of my results by making use of the original health index, which is surveyed only every second year. As expected, the association for women between starting a career with a fixed-term contract and mental health does not change qualitatively but quantitatively. The coefficients are larger in absolute terms but remain negative and more importantly statistically different from zero. Moreover, the contemporaneous effect also be-

comes (weakly) significant, meaning that women already experience worse mental health in the year they enter the labor market. A possible explanation could be that assuming a linear trend in health status is too restrictive, especially during the beginning of the career. Again, the baseline test confirms the finding that women in temporary employment before career start do not differ in their (mental) health status. Experiencing the uncertainty associated with a temporary position makes them feeling worse than their counterparts starting with a regular, permanent contract.

Table 6 Sensitivity analysis I: Original (mental) health index without linearity assumption

Dependent Variable	Mental Health Index (orig.)	
	(I) Women	(II) Men
At labor market entry (1 st year)	-3.875* (2.182)	-0.928 (2.853)
2 nd year on the labor market	-4.503** (1.929)	-1.457 (2.918)
3 rd year on the labor market	-4.321** (2.001)	1.394 (3.613)
4 th year on the labor market	0.379 (2.921)	-1.174 (2.661)
5 th year on the labor market	-3.510 (2.312)	4.809* (2.857)
<i>N</i>	148	115
<i>Baseline test: before labor market entry</i>	0.148 (1.520)	-1.282 (1.927)

Note: Marginal effects of starting a career with a fixed-term contract(OLS); robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; all regressions contain controls for individual characteristics, background characteristics, job characteristics, personality traits and attitudes, partnership status, ex-ante health status, federal-state-of-first-job dummies, and year-of-graduation dummies.

Next, I provide results for different age-at-graduation cutoffs. In the main sample, I assume the maximum age at graduation if men or women are older than 35 years when they enter the labor market. Table 7 shows the coefficients from regressions with a lower and higher age cutoff. The results confirm the previous findings: while the baseline test shows no differences before labor market entry (either for men or for women), women tend to have worse mental health in Year 2 and 3 after career start. The size of the estimates in the sample with oldest individuals being 30 at graduation is largely comparable with the number from the main re-

gressions. Extending the sample up to age 40 dampens the effect; however, statistically, the coefficients are not different from the ones in Table 2. The results for men suggest that fixed-term employment at the beginning of the career does not affect their mental health. Although the coefficient in Year 5 on the labor market is positive, this could be due to the fact that the health conditions are different before labor market entry (the baseline test is not significant but large in size).

Table 7 Sensitivity analysis II: Effects on mental health with different age-at-graduation cutoffs

	Women		Men	
	(I) Age at Graduation ≤30	(II) Age at Graduation ≤40	(III) Age at Graduation ≤30	(IV) Age at Graduation ≤40
At labor market entry (1 st year)	-1.972 (1.213)	-1.390 (1.020)	0.673 (1.492)	0.336 (1.230)
2 nd year on the labor market	-3.599*** (1.157)	-2.181** (1.038)	0.990 (1.512)	0.813 (1.298)
3 rd year on the labor market	-3.942*** (1.214)	-2.355** (1.164)	1.902 (1.570)	0.954 (1.433)
4 th year on the labor market	-2.243 (1.392)	-1.060 (1.224)	2.168 (1.641)	0.246 (1.429)
5 th year on the labor market	-1.111 (1.462)	-0.454 (1.205)	2.770* (1.585)	0.922 (1.363)
<i>Baseline test: before labor market entry</i>	0.161 (1.522)	-0.644 (1.451)	-2.771 (1.956)	-1.673 (1.608)

Note: Marginal effects of starting a career with a fixed-term contract(OLS); robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; all regressions contain controls for individual characteristics, background characteristics, job characteristics, personality traits and attitudes, partnership status, ex-ante health status, federal-state-of-first-job dummies, and year-of-graduation dummies.

I next relax the education restriction and include men and women who have no school degree. As Table 8 shows, these individuals do not substantially change the estimates. The main pattern from the previous regressions remains the same. In the very short run, women react to temporary employment at the beginning of their careers with worse mental health. This effect fades out over time and almost disappears five years after labor market entry. The size of the association in Years 2 and 3 is slightly smaller but statistically not distinguishable from the former results.

Table 8 Sensitivity analysis III: Effects on mental health including individuals with elementary education

Dependent Variable	Mental Health	
	(I) Women	(II) Men
At labor market entry (1 st year)	-1.280 (1.137)	0.683 (1.279)
2 nd year on the labor market	-2.475** (1.115)	1.463 (1.339)
3 rd year on the labor market	-2.875** (1.149)	2.043 (1.365)
4 th year on the labor market	-1.122 (1.292)	1.418 (1.424)
5 th year on the labor market	-0.363 (1.286)	1.894 (1.391)
<i>Baseline test: before labor market entry</i>	0.403 (1.434)	-3.185* (1.673)

Note: Marginal effects of starting a career with a fixed-term contract(OLS); robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; all regressions contain controls for individual characteristics, background characteristics, job characteristics, personality traits and attitudes, partnership status, ex-ante health status, federal-state-of-first-job dummies, and year-of-graduation dummies.

Finally, I present evidence that the effect of starting a career with a fixed-term contract is not purely due to selection. For example, imagine an individual who has high ability and will therefore be more likely to find a permanent contract or at least it is more likely that her employer will offer her a permanent contract after a short period of probation on a fixed-term contract. At the same time, this person might have fewer mental problems due to economic uncertainty since she is convinced that her ability will be an advantage in finding an appropriate and permanent position soon. Such a situation would cause a positive bias and the results would underestimate the true effect. Fortunately, the SOEP data allow me to control for a variety of individual characteristics that are typically unobserved in other survey data. Thus, all regressions include controls for degree of risk aversion and locus of control as well as personality traits and general attitudes, among others.

Table 9 Sensitivity analysis IV: Selection into fixed-term contract at the beginning of the career

Dependent Variable	Starting a Career with a Fixed-Term Contract			
	Women		Men	
	(I)	(II)	(III)	(IV)
Ex-ante mental health	0.000 (0.003)	0.001 (0.003)	-0.002 (0.003)	-0.002 (0.004)
Ex-ante health satisfaction		-0.007 (0.018)		-0.010 (0.018)
Ex-ante life satisfaction		-0.018 (0.019)		-0.002 (0.020)
Doctor visits in year before labor market entry	-0.000 (0.002)	-0.001 (0.003)	0.002 (0.004)	0.002 (0.004)
Hospital stays in year before labor market entry	0.062 (0.049)	0.064 (0.049)	-0.023 (0.092)	-0.034 (0.093)
Age at graduation	-0.014* (0.008)	-0.014* (0.008)	-0.002 (0.008)	-0.003 (0.008)
Migratory background	-0.017 (0.068)	-0.022 (0.067)	0.020 (0.076)	0.022 (0.078)
Years of education	0.017 (0.014)	0.018 (0.014)	0.013 (0.013)	0.014 (0.014)
Born in East Germany	-0.040 (0.102)	-0.038 (0.100)	-0.125 (0.094)	-0.131 (0.097)
Highly educated mother	-0.181** (0.084)	-0.187** (0.085)	0.016 (0.085)	0.018 (0.086)
Employed mother	-0.105 (0.089)	-0.103 (0.089)	0.039 (0.088)	0.052 (0.090)
Mother's age at respondent's birth	0.007 (0.006)	0.007 (0.006)	-0.007 (0.007)	-0.006 (0.007)
Number of siblings	-0.040 (0.090)	-0.033 (0.089)	-0.030 (0.081)	-0.021 (0.083)
Openness	-0.017 (0.027)	-0.013 (0.027)	0.026 (0.026)	0.027 (0.027)
Agreeableness	-0.017 (0.032)	-0.018 (0.032)	-0.017 (0.029)	-0.019 (0.029)
Conscientiousness	-0.040 (0.034)	-0.039 (0.034)	-0.003 (0.028)	-0.000 (0.028)
Extraversion	-0.015 (0.024)	-0.013 (0.024)	-0.041 (0.025)	-0.041 (0.026)
Neuroticism	0.051 (0.038)	0.053 (0.038)	0.012 (0.039)	0.009 (0.040)
Risk aversion	-0.049 (0.112)	-0.039 (0.116)	0.071 (0.115)	0.064 (0.118)
Locus of control	-0.014 (0.043)	-0.019 (0.044)	0.019 (0.045)	0.014 (0.046)
In partnership at labor market entry	0.014 (0.060)	0.011 (0.061)	-0.096 (0.059)	-0.096 (0.060)
Number of children at labor market entry	-0.040 (0.042)	-0.037 (0.042)	0.043 (0.053)	0.042 (0.054)
<i>N</i>	283	283	233	232
<i>R</i> ²	0.37	0.37	0.35	0.35

Note: Marginal effects (OLS) with robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; all regressions contain controls for federal-state-of-first-job dummies and year-of-graduation dummies.

If I am willing to assume that, conditional on all observable characteristics, holding a fixed-term contract at the start of a career is randomly assigned, then I am able to estimate a consistent average treatment effect on the treated (ATT). To estimate the average treatment effect

(ATE), I need to make other (probably unrealistic) assumptions to rule out any selection bias. Therefore, I further investigate the selection issue by testing whether any of the predetermined observable characteristics significantly affects the likelihood of starting a career on a fixed-term contract (Table 9). Almost none of the coefficients are significantly different from zero, the exception being age at graduation (weakly significant negative effect) and having a mother with a tertiary degree (significantly negative coefficient) in the sample of women (Columns I and II).

In the male sample (Columns III and IV), none of the explanatory variables significantly influences the type of first contract. It is important to note that all variables related to the health status before labor market entry have no explanatory power for the type of first contract. Even if I include ex-ante life and health satisfaction, as in Columns II and IV, the coefficients remain insignificant. This result is reassuring and important as it provides further supporting evidence against the possibility of health-related self-selection into fixed-term contracts at labor market entry.

3.3 Heterogeneous Health Effects by Education and Gender

I also analyze potential differences in mental health outcomes between gender and education subgroups (Table 10). Women who start their career with a fixed-term contract and who have not obtained a university degree (Column I) are the most affected group. The association is pronounced and remains significant until five years after graduation.¹¹ In contrast, I find no significant effects among women with higher education. Furthermore, and surprisingly, men with secondary education display significantly better mental health status when they started their career at a temporary job. This is completely the opposite of what I observe for women.

¹¹ In fact, the coefficient four years after labor market entry is statistically not different from zero but economically sizeable. Probably the large positive coefficient in the group of tertiary educated women causes the estimates in the full sample three to five years after labor market entry to be small and insignificant.

Table 10 Heterogeneity analysis for mental health outcomes (OLS)

Sample	Women		Men	
	(I) Secondary Edu- cation	(II) Tertiary Edu- cation	(III) Secondary Edu- cation	(IV) Tertiary Edu- cation
At labor market entry (1 st year)	-1.458 (1.662)	-1.659 (2.649)	3.679 (2.279)	2.625 (2.237)
2 nd year on the labor market	-4.629** (1.937)	-1.609 (2.992)	4.143* (2.383)	-0.021 (3.478)
3 rd year on the labor market	-5.421** (2.409)	-0.921 (2.118)	6.559** (2.445)	-0.439 (4.083)
4 th year on the labor market	-4.030 (2.945)	3.859 (2.402)	8.605*** (2.831)	-0.190 (3.804)
5 th year on the labor market	-5.071** (2.456)	4.754 (2.900)	7.930** (3.175)	4.448 (3.157)
<i>Baseline test: before labor market entry</i>	0.766 (2.726)	4.047 (4.072)	-4.275 (4.244)	-2.986 (4.720)

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; all regressions contain controls for individual characteristics, background characteristics, job characteristics, personality traits and attitudes, partnership status, ex-ante health status, federal-state-of-first-job dummies, and year-of-graduation dummies.

Whether this finding can be explained by certain labor market particularities of men with secondary education or by other (psychological) mechanisms remains an open question for future research. In contrast, the mental health of men with tertiary education seems to be unaffected by the type of contract held in their first job.

3.4 Potential Mechanism

An often-mentioned transmission channel for explaining poor mental health is the reduced job satisfaction of temporary employees (see Dawson et al. 2014; Booth et al. 2002). However, since I find no effects on job satisfaction of starting a career with a fixed-term contract, I suggest a different mechanism for explaining why women in precarious jobs at labor market entry feel worse. I argue that the negative path dependence and the associated economic uncertainty, as well as stress and anxiety about the future, are the underlying reasons for the mental health effects in women. Table 11 shows how starting a career with a fixed-term contract influences the probability of future fixed-term contracts as well as future unemployment spells. For women, the coefficients are positive and significant—at least for future fixed-term con-

tracts in the first two years following labor market entry. Afterward, they remain positive but converge to zero. For men, the pattern is even more pronounced but, interestingly, path dependence does not induce men to report worse mental (and physical) health, as was shown in the main analyses. Even if starting a career with a fixed-term contract makes repeated, consecutive temporary jobs more likely, the probability of future unemployment is not affected. This is somewhat surprising since I expect an increased threat of unemployment due to unstable labor contracts (see, e.g., Hagen 2002; Bruno, Caroleo, and Dessy 2012).

Table 11 Marginal effects of starting a career with a fixed-term contract on future labor market outcomes

Dependent Variable	Future Fixed-Term Contract		Future Unemployment Spell	
	(I) Women	(II) Men	(III) Women	(IV) Men
2 nd year on the labor market	0.344*** (0.069)	0.476*** (0.097)	-0.039 (0.064)	0.031 (0.085)
3 rd year on the labor market	0.126* (0.069)	0.250** (0.101)	-0.003 (0.066)	0.050 (0.070)
4 th year on the labor market	0.023 (0.060)	0.194** (0.083)	-0.124 (0.080)	0.017 (0.059)
5 th year on the labor market	0.079 (0.062)	0.078 (0.059)	0.038 (0.080)	0.053 (0.056)

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; all regressions contain controls for individual characteristics, background characteristics, job characteristics, personality traits and attitudes, partnership status, ex-ante health status, federal-state-of-first-job dummies, and year-of-graduation dummies.

To sum up, in the very short run, I find a negative association between starting a career with a fixed-term contract and mental health, but only for women. This finding does not appear to be driven by people with worse ex-ante health conditions selecting into nonpermanent jobs. A reason for these findings might be a path dependence of starting a career with a fixed-term contract. At least in the short- to medium-run, these women might have a higher likelihood of remaining in precarious employment. The prolonged uncertainty might weaken the mental health of these women. The fact that the gap in mental health closes after a few years might then be related to these women adapting to uncertain circumstances or finding permanent jobs.

4. Conclusion

Our analysis sheds light on potential spill-over effects of fixed-term employment on health outcomes. Using German data on young male and female graduates, I find a substantial reduction in female mental well-being due to fixed-term employment at the beginning of the career. This association is significant only in the short run, and has no effect after the fourth year on the labor market. Detailed analyses of the subcategories of the measure of mental health reveal that affected women experience more (time) pressure and more often feel depressed. These results are robust to several sensitivity tests. A possible explanation is the economic uncertainty associated with a career start in fixed-term employment. The likelihood of repeated spells in precarious jobs is significantly higher when entering the labor market on a temporary contract. Thus, I measure an indirect effect of the initial contract on health, which works through recurrent contemporaneous economic instabilities. The heterogeneity analysis shows that women with secondary education are particularly affected. In contrast, my results reveal no significant or robust correlations between job uncertainty at the beginning of a career and (mental) health for young men except for the subgroup of men with less than a university degree. The positive estimates are counterintuitive and worth further analysis. I address potential endogeneity threats by including a large set of controls and by showing evidence against health-related self-selection into temporary contracts at the beginning of a career. Similarly, among women, ex-ante baseline health indicators are not related to the type of contract in the first job. Hence, I believe that the results suggest a robust, negative association between fixed-term employment and women's mental health in the short run.

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