UNCERTAINTY IN THE LABOUR MARKET:
How does fixed-term employment affect fertility and mental health of the young generation?

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Uncertainty in the labour market: How does fixed-term employment affect fertility and mental health of the young generation?

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Abstract

We study the short- to medium-run effects of starting a career on a fixed-term contract on subsequent fertility and health outcomes. We focus on the career start since we expect that temporary contracts and their inherent economic uncertainty imply a path dependence which might have spill-over effects on other domains of life. Our empirical analysis is based on rich data from the German Socio-Economic Panel which provides comprehensive information about individuals' labour market history as well as fertility behaviour, and physical and mental health indicators. Our main results are that due to fixed-term employment at labour market entry women tend to: (i) postpone first births, (ii) have fewer children within ten years after graduation and (iii) have lower mental health status within three years after graduation. These associations are strongest in the subsample of native women with secondary education. In contrast, we find no significant correlations for men. We argue that these findings are robust to potential endogeneity threats.

1. Introduction

One of the most striking facts about the labour 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 temporary[1] employees among all 25 to 54 old employees made up around 12 per cent in Europe.[2] Germany has witnessed a particularly strong rise in fixed-term employment in recent years. By 2012 almost 50 per cent 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 which is crucial at once for career progression and family formation.[3] Recent evidence has shown that adverse labour market conditions at the beginning of the career can lead to severe and persistent earnings losses (e.g., Oreopoulos, von Wachter and Heisz 2012). Temporary employment might cause a similarly negative labour market path dependence through repeated episodes of temporary employment, a decelerated wage progression and a higher likelihood of future unemployment (Hagen 2002; Bruno, Caroleo and Dessy 2012; Booth, Francesconi and Frank 2002; Pavlopoulos 2009). So far, previous studies have mainly linked contemporaneous temporary employment and fertility or 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 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 still very scarce.

The main objective and contribution of this paper is to fill this gap by empirically assessing the implications of *entering* the labour market on a fixed-term contract on subsequent fertility,

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[1] Throughout this paper, the terms fixed-term contract and temporary contract will be 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 nine percent of those aged 35 to 39.

physical, and mental health outcomes. From a theoretical perspective the effect of fixed-term employment on fertility and health is not clear in advance. First, demand for children should be reduced as wages of fixed-term employees are on average lower (income effect). Second, lower wages also imply smaller direct opportunity costs and in consequence a higher incentive for childbearing. Third, fixed-term contracts exacerbate the future career costs of children through higher costs of future job search as human capital accumulation in temporary jobs is generally decelerated (Albert, García-Serrano and Hernanz 2005). In addition, lower opportunity costs might let individuals devote more time to healthy behaviour 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, we focus on several cohorts of graduates from vocational training or tertiary education and follow them up to 10 years after entering the labour market. We analyse the timing of first birth (tempo effect) as well as the number of children (quantum effect) in the short- to medium-run. Furthermore, we use our particular empirical setup to investigate effects of starting a career on a fixed-term contract on subsequent health outcomes in the short run. Another contribution of our paper is to carefully discuss and address the potential selection of individuals into different types of contracts. To reduce possible omitted variable bias we exploit our rich and unique data set and include a large set of new control variables (e.g., personality traits, family and career related attitudes, family background).

Based on the survey years 1996 to 2012 of the German Socio-Economic Panel (SOEP), our results for natives confirm that starting the career on a fixed-term contract is negatively associated with subsequent fertility outcomes: We find an increased postponement of first birth and a reduction in the number of children in the first 10 years after graduation. These results also hold when we expand the sample and include migrants in the analysis; however, the effects on the full sample are slightly less pronounced. Furthermore, we show that fixed-

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term employment seems to be particularly affecting fertility decisions of women with secondary education. We find no significant correlations between job uncertainty and fertility for the subsample of men. Regarding the health outcomes, our analyses show that women tend to have lower mental conditions, however, only in the short-run. Physical health outcomes as well as the health status of men are not affected at all by the type of the first contract. As fertility decisions and health status as well as holding a fixed term contract may be driven by unobserved heterogeneity we address potential endogeneity concerns twofold: First, by including many important and previously neglected control variables and second, by showing that entering the labour market on a fixed-term contract is related neither to family nor to career preferences. Against this background, we reckon that our results actually reflect a robust, negative relationship between job uncertainty in the early career and the timing and number of children. Even though we are not able to examine the effect on completed fertility in this empirical set-up, our results suggest that completed fertility might be negatively affected as well. Similarly, health outcomes are only observed in the first 5 years of the career. However, since the effects vanish rapidly after labour market entry, we do not expect that there are any long-run health consequences of starting the career on a fixed-term contract.

In general, our research contributes to the growing literature on economic uncertainty and fertility on the one hand, and economic uncertainty and health on the other hand. Several empirical studies suggest that fertility reacts pro-cyclically to macroeconomic conditions: higher unemployment rates are generally associated with reduced fertility rates and vice versa (e.g., Adsera 2005; Adsera and Menendez 2011; Goldstein et al. 2013). Analyses of how individual unemployment affects fertility yield mixed evidence (e.g., Del Bono, Weber and Winter-Ebmer 2012; Kreyenfeld 2010). Focusing on perceived economic uncertainty using German data, Bhaumik and Nugent (2011) and Hofmann and Hohmeyer (2013)[4] find a

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[4] The study by Hofmann and Hohmeyer (2013) stands out from the other studies by attempting to correct for the potential endogeneity of subjective economic uncertainty.

reduction in fertility while the study by Kreyenfeld (2010) confirms this result for the subsample of highly educated women. The literature on the health consequences of economic uncertainty mainly focuses on aggregate unemployment and how it affects mortality rates (see e.g., Ruhm 2000, 2003, and 2005). Mortality rates seem to follow a pro-cyclical pattern at state-level which is surprising since this suggests an adverse health effect of *lower* unemployment rates. On the individual level the relationship seems reversed. For instance, Sullivan and von Wachter (2009) show a particularly pronounced increase in the annual probability of dying immediately after the job loss. Theodossiou and Vasileou (2007) find that the effect of perceived risk of job loss on job satisfaction is significantly negative and large.

Temporary employment is considered as one particular form of economic uncertainty. Unfortunately, evidence on the relationship between fixed-term employment and fertility is scarce and inconclusive. For Germany, Gebel and Giesecke (2009) find no evidence for an influence of fixed-term contracts on the fertility decision of young couples, while the results by Schmitt (2012) suggest a negative impact. Tölke and Diewald (2003) find evidence for a postponement of first birth due to economic uncertainty for young men. Kind and Kleibrink (2013) disagree by concluding that time limited contracts postpone childbearing only for women but not for men. Studies from other European countries report more robust results. For Spain, the studies by Ahn and Mira (2001) and de la Rica and Iza (2005) conclude that fixed-term employment has a negative effect on the hazard of marriage and delays childbearing. Similarly, Sutela (2012) resumes that in Finland fixed-term employment is negatively associated with entering parenthood. Several studies concentrate on subjective well-being and analyse the effects of fixed-term employment on life and job satisfaction (Chadi and Hetschko 2013; Dawson and Veliziotis 2013; Bardasi and Franceconi 2004). Being closest to our research, Rodriguez (2002) analyses British and German micro data and finds that German workers with fixed-term contracts have a significantly higher probability for reporting worse

health than their permanently employed colleagues. In contrast, the effect of fixed-term employment is not significantly different from zero among British workers, a finding which is in line with the results of Bardasi and Francesconi (2004) for the UK. All these studies have in common that they focus mostly on empirical associations between holding a fixed-term contract and fertility as well as health outcomes. They do not consider the potential endogeneity problems of fixed-term contracts which might be increasing in labour market experience as well as previous number of children and health status due to potential feed-back effects. Having a child or bad health might increase the likelihood of holding a fixed-term contract later in life (when re-entering the labour market) and therefore makes fixed-term employment endogenous to our outcome. They also do not take into account the potential path dependence of entering the labour market on a contract with limited duration.

The remainder of the paper is organized as follows. The following section motivates our empirical analysis by descriptively showing the relationship between fixed-term employment, economic uncertainty, and fertility decisions of young couples. Section 3 introduces our data and our empirical approach. The main results as well as several sensitivity and subgroup analyses are presented in sections 4 and 5. Section 6 concludes and discusses potential policy implications.

2. Descriptive Evidence

This section aims at descriptively motivating economic uncertainty as the main channel through which starting a career on a fixed-term contract affects outcomes in other domains of life. We employ two large-scale and nationally representative German micro-data sources – the German Socio-Economic Panel (SOEP)[5] and the Panel Analysis of Intimate Relationships

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[5] For more information regarding this data set see section 3.1.

and Family Dynamics (pairfam)[6] – to shed light on a) the degree of economic uncertainty and the path dependence associated with a career start in a fixed-term employment and b) the role of economic security for the decision to have children.

2.1 Fixed-term Contract and Economic Uncertainty

To capture economic uncertainty we employ several subjective as well as objective measures. Table 1 shows the individual perception of job security and own economic situation by type of contract after controlling for several socio-economic characteristics as well as net wages. Over 47 per cent of all employees on a regular, permanent contract report that they are not concerned at all about the security of their job, whereas only 24 per cent of the temporary employed individuals do not worry about job security. In contrast, while almost one third of all individuals on a fixed-term contract are very concerned about their job security, this is only true for 12 per cent of workers on permanent contracts. A similar picture emerges if we look at the assessment of the general economic situation. While only 18 per cent of all permanent employees report that they are very concerned, over 26 per cent of their temporary colleagues do so. Thus, self-reported job and economic uncertainty is indeed much more pronounced among temporary than among permanent employees even when conditioning on wages and socio-economic characteristics.

Table 1 Worries about job security and economic situation (in per cent)

	Very concerned	Somewhat concerned	Not concerned at all
A. Are you concerned about job security?			
Permanent Contract	12.1	40.4	47.5
Fixed-term Contract	29.0	47.2	23.8
B. Are you concerned about your own economic situation?			
Permanent Contract	17.8	56.0	26.3
Fixed-term Contract	26.2	56.0	17.8

Note: SOEP 1995-2012, employed men and women, 18-49 years, predicted probabilities controlling for gender, age, education, migratory background, net wage, occupation, industry, year, and federal state.

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[6] The pairfam study (Huinink et al., 2011) covers the complex processes of partnership development, family formation, childrearing as well as intergenerational relations. It was first conducted in 2008/2009, and consists of three birth cohorts. The first wave of the birth cohort 1981-1983 which is used in this section comprises 1,238 childless women and 1,659 childless men.

We find a similar pattern when using several objective measures of economic uncertainty, namely income volatility, future unemployment risk, and wages progression. Our first measure, income volatility, reflects the degree of uncertainty in wages attached to fixed-term employment. Following Bonin et al. (2007) we analyse the variance of the residual part of a Mincer wage regression using individual net and gross labour income. If the variance of the unexplained part for temporary employees exceeds the one for permanent workers income uncertainty is higher for the former.

Table 2 Variance ratio test by type of contract

	Net wages	Gross wages
A. Mean values		
Permanent contract	1496.6	2341.5
Fixed-term contract	1195.2	1867.4
B. Variance		
Permanent contract	0.241	0.274
Fixed-term contract	0.345	0.386
C. Variance Ratio Test		
F-statistic	0.699	0.712
p-value	0.000	0.000

Note: SOEP 1995-2012, employed men and women, 18-49 years, controlling for gender, age, education, migratory background, experience, tenure, net wage, occupation, industry, year, and federal state.

Table 2 shows variances, test statistics and p-values for the variance ratio test. On average, wages of temporary employees are smaller than those of their colleagues with permanent contracts. Furthermore, the earnings are more volatile and therefore more uncertain for temporary workers. The formal test confirms this result since the F-statistic leads to a rejection of the null hypothesis of equal variances (p-value<0.001). Individuals with a fixed-term contract experience significantly higher earnings uncertainty compared to individuals in permanent jobs.

Descriptive evidence regarding future unemployment risk and future wages related to fixed-term employment is provided in Table 3. We present future labour market outcomes for individuals whose first job in their career is on a temporary or on a permanent basis. The

picture that emerges supports the notion of a negative path dependence of starting a career on a fixed-term contract. The risk of subsequent unemployment is substantially higher if the first job has a limited duration. During the first 10 years after labour market entry these individuals are more likely to have had at least one unemployment spell than their colleagues who started with a permanent contract. On average, they have also experienced more periods of unemployment. In contrast, conditional on employment the net wages of both groups are only slightly different at the beginning of the career and converge over time (Table 3, Panel C). However, when including unemployed individuals in the wage calculations, the earnings gap widens (Table 3, Panel D).[7] Hence, while we do not find evidence for strong differences in actual wage profiles (see Booth, Francesconi, and Frank 2002; Pavlopoulos 2009), cumulative earnings and earnings' stability are much lower among those employees who entered the labour market on a fixed-term contract.

Table 3 Path dependence of starting a career with a FTC

Starting a career with…	3 years after graduation	5 years after graduation	7 years after graduation	10 years after graduation
A. Incidence of at least 1 unemployment spell (in per cent)				
Permanent contract	10.5	17.4	22.7	26.8
Fixed-term contract	18.7	26.3	29.9	35.6
B. Number of unemployment spells				
Permanent contract	0.12	0.26	0.41	0.65
Fixed-term contract	0.22	0.44	0.65	0.99
C. Net wages				
Permanent contract	1377.1	1494.9	1605.4	1791.6
Fixed-term contract	1284.1	1415.9	1584.6	1747.6
D. Net wage (UE=0)				
Permanent contract	1234.6	1268.6	1361.3	1514.2
Fixed-term contract	1036.9	1156.6	1297.8	1419.9

Note: SOEP 1995-2012, men and women, 18-49 years.

To sum up, descriptive statistics suggest that holding a fixed-term contract is indeed associated with a high degree of uncertainty and negative future-career consequences. This holds for subjective as well as objective measures of economic uncertainty.

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[7] We included unemployed and inactive individuals in these earnings calculations by assigning them a zero labour market income.

2.2 Job Security and First Birth

How does the economic situation affect fertility decisions of young couples? Table 4 lists the two most often mentioned conditions for having children (based on pairfam data). Both are related to the work environment: parenthood has to be financially affordable and has to be compatible with work life.[8] The numbers differ only marginally by type of contract: for instance, 77 (78) per cent of the male (female) respondents in permanent employment report that the financial affordability must be satisfied before having a first child, while 78 (79) per cent with fixed-term contract do so. Hence, both groups do not differ substantially in their desire for economic security and stability before having children. This suggests that young people do not self-select into fixed-term contracts with respect to these observable family and work related attitudes.

Table 4 Conditions for having children (in per cent)

	Men	Women
A. Financial affordability must be satisfied before first birth:		
Permanent contract	76.9	77.8
Fixed-term contract	77.9	78.8
B. Compatibility with work life must be satisfied before first birth:		
Permanent contract	63.1	68.3
Fixed-term contract	64.0	69.2

Note: pairfam 2009, childless men and women, 24-29 years, predicted probabilities controlling for gender, age, education, migratory background, parental education, importance of career and family, and federal state.

In contrary to this striking similarity are the differences in the answers on whether these conditions are satisfied or not (Table 5). The gaps between individuals with fixed-term and permanent contracts are substantial. Male respondents with a fixed-term contract are almost 15 (13) percentage points less likely to rate the financial (job-related) situation as good enough to become parents. Women with a fixed-term contract assess their financial preconditions to enter motherhood equally poor: only 48 per cent report that the financial conditions allow them to have a baby. This is almost 15 percentage points less than women

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[8] Examples for other, but less important prerequisites are the availability of child care or leisure-time interests.

with a regular contract. This descriptive evidence indicates that job-related factors play a major role in young couples' decisions to have children. Independent of the type of the employment contract individuals prefer an economically secure situation for having children. However, the conditions are less often satisfied for temporary than for permanent employees.

Table 5 Satisfaction of conditions for having children (in per cent)

	Men	Women
A. Financial affordability is satisfied:		
Permanent contract	60.0	62.3
Fixed-term contract	45.5	47.9
B. Compatibility with work life is satisfied:		
Permanent contract	59.7	59.5
Fixed-term contract	46.6	46.4

Note: pairfam 2009, childless men and women, 24-29 years, controlling for gender, age, education, migratory background, parental education, importance of career and family, net wage, and federal state.

2.3 Fixed-Term Contracts and Health

Turning our attention to descriptive associations between holding a fixed-term contract and subjective health measures, we see a similar picture for both sexes. Table 6 shows that women and men in fixed-term employment rate their general health on average lower than their counterparts in permanent jobs. The same, but less pronounced pattern emerges when we look at the general life satisfaction. On average the share of respondents reporting very high levels of satisfaction (9 or 10) is lower for men and women in fixed-term jobs. However, this difference seems less distinct than the difference for the general health indicator. All in all the data does not show a clear relationship, but suggests a negative association between fixed-term employment and health.

The descriptive analysis in this section suggests that (a) fixed-term contracts are indeed associated with increased economic uncertainty and that (b) economic uncertainty seems to deter young men and women from entering parenthood and reduces health and satisfaction mainly for women. The resulting hypothesis that temporary employment induces a

postponement of first birth (or even a negative fertility effect) and a lower self-rated health status will be empirically assessed in a regression framework in the next section.

Table 6 Self-rated health and life satisfaction by type of contract

	Men	Women
A. General health (good/very good)		
Permanent contract	75.1	68.9
Fixed-term contract	68.2	61.3
B. Life Satisfaction (>9/10)		
Permanent contract	26.4	26.4
Fixed-term contract	24.0	24.0

Note: pairfam 2009, men and women, 24-29 years, predicted probabilities controlling for gender, age, education, migratory background, parental education, importance of career and family, net wage, and federal state.

3. Data and Empirical Strategy

3.1 Data, Sample Restrictions, and Variables

We employ the German Socio-Economic Panel (SOEP) which provides annual and nationally representative panel data since 1984 (Wagner, Frick and Schupp 2007). In 2012 it covered more than 20,000 individuals living in over 12,000 households. SOEP contains detailed information about a variety of individual as well as household specific socio-economic characteristics. Moreover, the respondents provide information about their labour market history as well as their current labour force status. Most importantly, we know whether their employment contract is permanent or temporary. We focus on the waves 1995 to 2012 since consistent information on the type of the employment contract for all working individuals was only collected from 1995 onwards.[9]

3.1.1 Fertility analysis: Sample restrictions and outcome variables

For the fertility analysis, our main sample consists of native women who are childless, 18 to 30 years old at the time of graduation and for whom information on subsequent fertility

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[9] Respondents who have not reported a job change were excluded from this question. Thus, switching from temporary to permanent at the same employer was not part of the questionnaire up to 1995.

outcomes for at least 10 years after graduation is available.[10] Furthermore, we restrict the main analysis to women who have obtained at least a vocational degree.[11] The restriction concerning the age at graduation is motivated by the fact that we want to make sure that the biological preconditions for becoming pregnant and giving births are not too different in the 10 years following graduation. Women who finish their education after their 31st birthday have a comparatively narrower biological time interval to postpone the birth of their first child. Furthermore, for these older women it seems more likely that fertility and education choices are made simultaneously. Finally, we end up with a balanced sample of 267 women from the graduation cohorts 1995 to 2003 whom we observe at the start of their career and at least once again 10 years after graduation.

The outcome variables are the following: First, to measure the timing of first births we create a set of dummy variables taking on the value 1 if a woman has had a first child in year z after graduation ($z = 4, \ldots, 10$, focus on the first 4 to 10 years after labour market entry) and remains 1 from this point onwards. The variable is 0 if the woman is still childless in that particular year z. For instance, for a woman who has remained childless until the 5th year on the labour market and has a child from year 5 on, we code the outcome variable as 0 for years 1 to 4 and as 1 for years 5 to 10. Second, to analyse the quantum effect, i.e. whether a postponement of first birth also translates into a decline in the realized number of children, we generate a set of variables indicating the number of children, again in every single year 4 to 10 after career start.[12] The dependent variables thus reflect the proportion of women who have had their first child after a certain period after graduation as well as the average number of children.

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[10] To be precise, these women are childless and not pregnant when they enter the labour market. For those individuals who did not participate in each wave of the survey we filled in the missing fertility information retrospectively using the birth history reported in year 10 after graduation.

[11] We apply these restrictions to increase the homogeneity of our small sample and to drop outliers (e.g., there are only 9 observations with elementary education). However, our main results hold when we relax the sample restrictions (see Section 4.3)

[12] Due to the low number of first births 2 and 3 years after graduation, there is not enough variation to run a proper ML estimation. Therefore, we start in the fertility analysis in the 4th year after graduation.

3.1.2 Analysis of physical and mental health: Sample restrictions and outcome variables

In the analysis of health consequences we restrict the sample to women and men who enter the labour market before their 36th birthday and have at least a secondary school degree. Again, we obtain a balanced sample by restricting the sample to men and women who answer the questionnaire in five subsequent years after their labour market entry. Since the health questions are surveyed every second year starting in 2002, we are not able to look at the same ten-year window as in the fertility analysis. The questions regarding life and health satisfaction are available for the whole observation period on a yearly basis. The sample for the health (satisfaction) analysis comprises 226 (601) women and 185 (546) men from the graduation cohorts 2002 to 2007.

In order to measure the health status of the individuals in the sample, we make use of different outcome variables. First, the SOEP data provides us with an overall and cardinal measure of mental and physical health.[13] Second, the data also contains information on each of the subcategories of the health indices which we use in a refinement of the analysis. Third, we use self-rated information about the satisfaction with life and health status. Although these variables are measured on a scale from zero (worst outcome) to ten (best outcome), we assume cardinality and do not further manipulate the scales.

3.1.3 Explanatory variables

The main explanatory variable is a binary variable indicating whether the first job after graduation is on a fixed-term employment contract or on a permanent contract (we also control for whether the respondent is unemployed after graduation).[14] A great advantage of

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[13] For more details how the cardinal measures for mental and physical health is constructed from the survey items, see Andersen et al. (2007).

[14] We use the expressions "year of graduation" and "year of labour market entry" interchangeably even though technically speaking we measure the information on the first job in the calendar year after graduation. The main reason for doing so is that we do not have information on the exact date of graduation. With our approach we want to make sure that the job information is indeed measured after graduation.

the SOEP data is the variety of unique information about the respondent. It allows us to include a large set of controls for individual, background, personality and first job characteristics as well as partnership status at labour market entry. All control variables are either predetermined (determined before labour market entry) or measured in the year of career start. Individual control variables are age at graduation, years of education and being born in East Germany.[15] As a proxy for the respondent's pre-determined family and career related background we include variables indicating whether her mother has tertiary education, whether her mother was employed when she was 15 years old, whether she has siblings and her mother's age at her own birth. Personality traits and self-reported attitudes are captured by the 'Big 5', locus of control, and Kluckhohn's importance of life areas. More precisely, five variables reflect the respondent's openness to new experience, agreeableness, conscientiousness, extraversion as well as neuroticism. Locus of control takes on high values if the respondent is convinced that her own actions determine her success in life. Four binary variables indicate individual career and family related attitudes and values. The latter take on the value 1 if a woman claims that having children, being in a happy partnership/marriage, the ability to afford something or making career is important or very important in her life.[16] In addition, a dummy variable indicates whether a woman is risk averse, i.e. reports a (very) low subjective willingness to take risks. As regards the characteristics of the first job, we include only very rough indicators, namely, dummy variables for blue versus white collar occupations and five industry dummies for the main economic sectors.[17] The prevalence of fixed-term employment differs across industries and occupational groups. Similarly, women and men

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[15] In the robustness checks we include migrants in the sample and add a control variable for migration background.

[16] 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 labour market or partnership experiences on personality traits and family and career attitudes, we only use the first available observation. According to the psychological literature personality traits are stable in adulthood. The majority of women answer this question around the age of 21 or younger.

[17] The 5 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. We dropped the only respondent working in the agricultural sector.

with particular fertility preferences or health conditions might self-select into particular industries and occupational groups. By controlling for these job characteristics we want to make sure that our results do not reflect spurious correlations between temporary jobs, fertility and (mental) health.[18] Finally, we include a dummy variable indicating whether the person is in a partnership at career start. The set of control variables in the health regressions is slightly different: We add indicators for baseline health conditions (pre-graduation) such as the number of doctor visits and the days in hospital before labour market entry. In addition we control for the health status before entering the labour market. This is equivalent to a lagged dependent variable approach and equalises the baseline health of all observed individuals.

Table 7 Descriptive statistics 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
First Birth after 3 years	0.136	0.343	177	0.171	0.379	76	0	0	14
First Birth after 5 years	0.322	0.469	177	0.263	0.443	76	0.071	0.267	14
First Birth after 7 years	0.446	0.499	177	0.421	0.497	76	0.286	0.469	14
First Birth after 10 years	0.605	0.490	177	0.553	0.501	76	0.643	0.497	14
Number of Children after 5 years	0.379	0.592	177	0.329	0.598	76	0.071	0.267	14
Number of Children after 7 years	0.588	0.726	177	0.579	0.753	76	0.286	0.469	14
Number of Children after 10 years	0.927	0.892	177	0.868	0.929	76	0.714	0.611	14
Mental Health after 2 year	49.51	8.498	110	47.83	7.711	63	49.69	7.772	46
Mental Health after 5 year	48.70	9.192	115	47.96	8.543	64	49.11	8.560	47
Physical Health after 2 year	55.82	5.843	110	56.01	6.315	63	55.43	6.228	46
Physical Health after 5 year	55.43	6.619	115	55.52	5.230	64	53.92	6.206	47

Note: Main fertility sample includes native women with at least secondary education, younger than 31 years old and childless at labour market entry; main health sample includes all women with at least secondary education, younger than 36 years old at labour market entry.

Table 7 contains summary statistics of the fertility and health measures by type of contract of the first job and employment status after graduation. The share of women in regular jobs who enter parenthood increases from almost 14 per cent within the first 3 years after graduation to more than 60 per cent after 10 years. Already 5 years after graduation women starting on a permanent contract have become mothers with a larger likelihood. The gap remains constantly between 2 and 6 percentage points. A similar, albeit weaker, pattern emerges when we

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[18] However, our main results are robust to excluding these industry and occupational dummy variables.

consider the total number of children. Mental health is slightly higher 2 years after labour market entry but this gap closes until year 5 on the labour market. For the measure of physical condition we cannot find any differences by type of contract.

3.2 Empirical Strategy

We examine the fertility and health effects of starting a career on a fixed-term contract more thoroughly in a regression framework. Our basic empirical strategy is to compare women and men entering the labour market on a fixed-term contract with their counterparts on permanent contracts in terms of their short- to medium-run fertility behaviour and health outcomes. The empirical set-up is comparable to the papers studying future effects of adverse labour market conditions at the beginning of the career (see e.g., Kahn 2010; Liu, Salvanes and Sørensen 2012; Stevens 2007). We take advantage of the fact that fixed-term employment tremendously increased over the last 15 years but not all regions and 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, labour demand driven increase in temporary employment. The underlying empirical model can be described in a very simple linear regression form as follows:

$$Y_{it_0+z} = \beta FT_{it_0} + \gamma UE_{it_0} + \delta' X_{it_0} + \varphi_{st_0} + \mu_{t_0} + \varepsilon_{it_0} \tag{1}$$

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. FT_{it_0} is an indicator variable for starting a career in a fixed-term employment and UE_{it_0} indicates whether an individual experiences an unemployment spell after graduation. Therefore, the base category in our regressions will be starting the career with a permanent contract. Further, X_{it_0} are observed pre-determined individual and job characteristics measured in t_0, φ_{st_0} is the federal state of the first job, μ_{t_0} is the year of graduation, and finally ε_{it_0} is the unobserved error term.

The specification in the health regressions is slightly different: We also add a lagged dependent variable (Y_{it_0-1}), namely the health status in the year before labour market entry. Doing so, we intend to make the changes in health status due to a fixed-term contract more comparable. The regression equation then looks as follows:

$$Y_{it_0+z} = \alpha Y_{it_0-1} + \beta FT_{it_0} + \gamma UE_{it_0} + \delta' X_{it_0} + \varphi_{st_0} + \mu_{t_0} + \varepsilon_{it_0} \qquad (2)$$

In both models it is crucial to include variables which influence the probability of holding a fixed-term contract and might simultaneously correlate with the fertility decision or 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 fertility and holding a fixed-term contract at labour market entry. If workers with particular characteristics or preferences for children self-select into particular types of contracts, our estimates would be biased. This aspect has been mainly ignored in previous studies analysing the role of fixed-term employment on fertility outcomes. For example, one might think of an individual which is strongly risk averse and therefore will hardly accept a fixed-term contract. She will be searching for a job until she finds an adequate permanent employment. But at the same time risk aversion might make her less likely to have a child since entering parenthood is obviously related to a high degree of uncertainty. This would cause a positive bias and our results would underestimate the true effect. In contrast, we can expect a negative bias if, let's say, a freedom and flexibility loving woman is more likely to accept a fixed-term contract and also less likely to have a high preference for children. Fortunately, the SOEP data allows us to control for a variety of individual characteristics and preference indicators. Thus, all regressions include controls for the degree of risk aversion as well as personality traits and general attitudes. For instance, family preferences are controlled for by Kluckhohn's importance of life areas measures. If we are willing to assume that conditional on all observable characteristics holding a fixed-term contract at the start of the career is randomly assigned, then we are able

to estimate a consistent average treatment effect on the treated (ATT). To estimate the average treatment effect (ATE) we have to make further (probably unrealistic) assumptions to rule out any selection bias. Therefore, we further investigate the selection issue by testing whether any of the pre-determined observable characteristics significantly affects the likelihood of starting the career on a fixed-term contract (Table A1 in the Appendix): Almost none of the coefficients are significantly different from zero; the exception being age at graduation (weakly significant positive effect) and risk aversion (significantly negative coefficient). In contrast to individual characteristics, the attributes of the first job play an important role for the determination of the type of contract. Not controlling for these characteristics would leave us with a considerable bias in the estimates. These results are re-assuring and important as they provide further supporting evidence against the possibility of fertility related self-selection into fixed-term contracts at labour market entry. Summing up, we cannot claim to estimate the causal effect of fixed-term employment on fertility outcomes as we 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 we believe that our results are robustly estimated associations.

We run separate regressions for all outcome variables using a standard probit model to estimate the association between starting a career on a fixed-term contract and the probability of entering parenthood. Since women only have a nonnegative integer number of children we apply a maximum likelihood procedure with an underlying Poisson distribution for the estimations on the number of children. The health analysis is based on OLS regressions. We use robust standard errors to account for potential heteroscedasticity.[19]

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[19] Basically, we use the same sample of 267 women in all estimations. In practice, the number of observations slightly differs between the estimations in the main table since the maximum likelihood procedure cannot use all observations if the outcome is predicted perfectly.

4. Main Results

4.1 Probability of entering motherhood

In this section we present the results of the regression analysis. Table 8 shows the main results of 8 separate probit regressions. Each cell reports the average marginal effect of starting the career with a fixed-term contract on the probability of having had a first child within z years after graduation. The first column reports the results from the specification including individual, background, and job characteristics. In the second column we add personality traits and attitudes. Finally, in the last column (III) we also add a control for partnership status. Column III is our preferred specification since it contains all relevant control variables.

The first finding is that the estimates are quite stable across the different specifications suggesting that the results are not purely driven by selection based on observable characteristics, personality traits and attitudes. Going from the top to the bottom of the table we proceed further in time. While the first row reports the average marginal effects on first birth probability 4 years after graduation, the last row reports the marginal effects after 10 years. The association between the first birth probability and starting the career on a fixed-term contract is zero up to 3 years after graduation since in these years the vast majority of women are still childless and work in their first job. But already after 4 years the size of the negative coefficient increases considerably and becomes significantly different from zero. For women entering the labour market with a fixed-term contract, the estimated probability of having entered motherhood within 5 years after graduation is smaller by almost 20 percentage points. The gap in year 10 after graduation is still at 15 percentage points. Hence, after a starting phase women who started their career on a fixed-term contract are significantly less likely to have become mothers compared to women on permanent first contracts. We interpret this finding as a postponement effect due to temporary employment at career start. The underlying mechanism is described in more detail in section 5.4.

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Table 8 Probability of first birth 4 to 10 years after graduation; average marginal effects for FTC (Probit)

	(I)	(II)	(III)
after 4 years	-0.102*	-0.127***	-0.147***
	(0.052)	(0.045)	(0.043)
after 5 years	-0.152***	-0.182***	-0.195***
	(0.052)	(0.044)	(0.043)
after 6 years	-0.123**	-0.148***	-0.160***
	(0.059)	(0.051)	(0.050)
after 7 years	-0.117*	-0.138**	-0.156***
	(0.064)	(0.059)	(0.055)
after 8 years	-0.147**	-0.159**	-0.172***
	(0.066)	(0.062)	(0.059)
after 9 years	-0.116*	-0.124*	-0.137**
	(0.067)	(0.064)	(0.061)
after 10 years	-0.127*	-0.139**	-0.152**
	(0.068)	(0.064)	(0.061)
N	267	267	267
First job characteristics	YES	YES	YES
Personality traits & attitudes	NO	YES	YES
Partnership status	NO	NO	YES

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; female sample, no migrants; all regressions contain controls for individual characteristics, background characteristics, state-of-first-job and year-of-graduation dummies.

All coefficients of the other explanatory variables not reported in Table 8 show the expected sign (Table A2):[20] For instance, all else equal, older graduates are more likely, and better educated are less likely to enter parenthood within 5 years. Family background seems to play no role for the own decision to have a child, but attitudes do: While women for whom the family is very important are significantly more likely, women for whom career is very important are significantly less likely to have entered motherhood during the 5-years period. Finally, having a partner at the moment of labour market entry increases the probability of becoming mother in the first 5 years after graduation. According to economic theories of fertility temporary jobs could affect fertility decisions through reduced first-job income (Becker 1981). In the main regression we do not control for individual's income explicitly since it might be endogenous. However, we include the most important predictors of average income such as education, age, occupation, industry, personality traits and attitudes. Hence,

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[20] Table A2 in the appendix provides an example of a complete regression table of the first birth probability 5 years after graduation.

we implicitly control for an individual's earnings potential, but leave out all remaining idiosyncratic variation in earnings which is probably highly endogenous.

4.2 Number of children

Does the delay in entering motherhood translate into a decline in the number of children? The evidence presented in Table 9 reveals significantly negative effects of entering the labour market on a fixed-term contract on number of children up to ten years after graduation. In comparison to the previous estimates, these results are slightly weaker and not as significant throughout all specifications.

Table 9 Number of children 4 to 10 years after graduation; average marginal effects for FTC (Poisson)

	(I)	(II)	(III)
after 4 years	-0.082	-0.121**	-0.155**
	(0.000)	(0.061)	(0.075)
after 5 years	-0.134	-0.190**	-0.215**
	(0.089)	(0.090)	(0.092)
after 6 years	-0.069	-0.125	-0.150**
	(0.091)	(0.000)	(0.074)
after 7 years	-0.127	-0.176*	-0.208**
	(0.099)	(0.097)	(0.088)
after 8 years	-0.202**	-0.240**	-0.247***
	(0.103)	(0.101)	(0.095)
after 9 years	-0.187*	-0.237**	-0.251**
	(0.114)	(0.112)	(0.107)
after 10 years	-0.224*	-0.278**	-0.286**
	(0.123)	(0.119)	(0.115)
N	267	267	267
First job characteristics	YES	YES	YES
Personality traits & attitudes	NO	YES	YES
Partnership status	NO	NO	YES

Note: Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; female sample, no migrants; all regressions contain controls for individual characteristics, background characteristics, state-of-first-job and year-of-graduation dummies.

In the full specification (column III), the estimated coefficient remains significantly different from zero and increases continuously. For instance, starting a career in a fixed-term job reduces fertility 5 years after graduation on average by almost 0.22 of a child and after 10 years by more than 0.28 of a child. This indicates that the observed stable postponement of

first birth does translate into lower fertility and cumulates over time. Since we do not observe women until the end of their reproductive age our analysis does not allow us making any statements about completed fertility. However, the significant reduction in the number of children 10 years after graduation points to a potential reduction in total fertility as well.

4.3 Robustness Checks: Fertility analysis

In this section we test the sensitivity of our main results in several ways. First, we test whether our main results which were based on a homogenous population subsample (natives with at least secondary education) are affected when we include individuals with migratory background and primary education (full sample). Second, we relax the age at graduation limitation to see whether our main results are robust to including women who finish their education or training after age 30. The results for both tests are shown in Table 10. The first column reveals that the negative association between starting a career on a fixed-term contract and entering motherhood also holds for the full sample. The results seem particularly robust for years 5 to 8 and even 10. Overall, the estimated coefficients are slightly smaller than those in Table 8 and the significance levels for the early and late years are somewhat reduced. For instance, the average marginal effects on having had a first birth after 5 years after graduation decline by 5 percentage points but remain statistically significant. Fixed-term employment does not seem to influence the fertility decisions of migrants to the same degree as it does affect the decision of non-migrants. A potential explanation might be cultural differences in fertility behaviour (Fernandez and Fogli 2006). Turning our attention to the effects on the number of children (Table 10, column IV), we see that the estimated marginal effects are smaller than in our main specification and are less precisely estimated. Hence, in the full sample, including migrants and women with elementary education, the significant postponement effect of fertility translates to a weaker extent into a significant reduction in the number of children in the 10 years following graduation.

Table 10 Sensitivity analysis; average marginal effects of Probit and Poisson regressions for FTC

Dependent variable	First Birth			Number of Children		
	(I)	(II)	(III)	(IV)	(V)	(VI)
Sample	Full sample	Age at Graduation <35	Age at Graduation <40	Full sample	Age at Graduation <35	Age at Graduation <40
after 4 years	-0.083**	-0.125***	-0.113**	-0.072	-0.131*	-0.101
	(0.041)	(0.046)	(0.047)	(0.058)	(0.068)	(0.071)
after 5 years	-0.143***	-0.172***	-0.162***	-0.153**	-0.206***	-0.185**
	(0.043)	(0.044)	(0.045)	(0.066)	(0.066)	(0.086)
after 6 years	-0.130***	-0.138***	-0.121**	-0.114	-0.126*	-0.087
	(0.045)	(0.049)	(0.050)	(0.081)	(0.075)	(0.078)
after 7 years	-0.147***	-0.139**	-0.128**	-0.172*	-0.189**	-0.157*
	(0.049)	(0.055)	(0.055)	(0.088)	(0.088)	(0.088)
after 8 years	-0.135***	-0.160***	-0.138**	-0.166*	-0.241***	-0.198**
	(0.052)	(0.058)	(0.058)	(0.095)	(0.091)	(0.093)
after 9 years	-0.103*	-0.106*	-0.087	-0.156	-0.208**	-0.168
	(0.054)	(0.060)	(0.061)	(0.104)	(0.105)	(0.105)
after 10 years	-0.123**	-0.117*	-0.096	-0.208*	-0.244**	-0.199*
	(0.053)	(0.060)	(0.061)	(0.108)	(0.111)	(0.113)
N	363	287	294	363	287	294

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, first job characteristics, personality traits and attitudes, partnership status, state-of-first-job and year-of-graduation dummies.

Our main results are also generally robust to relaxing the age-at-graduation restriction. The average marginal effects for the main sample including childless women graduating up to age 34 and 39 are reported in Table 10, columns II and IV and III and V respectively.[21] 10 years after labour market entry these women are 44 and 49 years old and have probably completed their fertility plans. Furthermore, compared to younger women these older graduates might have a lower fecundity and might find it increasingly difficult to realize their fertility intentions.[22] Nevertheless, for both samples fixed-term contract in the first job is associated with a lower probability of first birth up to the 8th year after graduation. The results for year 9 and 10 after graduation are not significantly different from zero anymore if we include also women who are relatively old (age 35+) at labour market entry. This could indicate that older graduates are not able to postpone childbearing too much as they are closer to the end of their

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[21] In our sample, about 4% and 2% of women who are childless at graduation finish their education when they are older than 34 and 39.

[22] For example, in our sample, none of the women graduating at age 39 and older give birth.

reproductive age. Overall, the postponement effects are slightly smaller than those in our main regressions but remain qualitatively almost equal. The results on number of children are also quite robust for the sample including women graduating up to age 34, but are smaller and less often significantly different from zero when including women graduating up to age 39. This could also be related to the reduced time window during which older graduates can realize their fertility intentions.

In a third robustness test we analyse whether our results are biased by potentially selected sample attrition. Recall that our main analysis is based on a (generated) balanced sample of women whom we observe for at least 10 subsequent years after they finish their education. If dropping out of the survey is correlated with starting the career on a particular contract this might confound our results. Therefore, we construct a balanced sample including all women who stay in the survey at least for 5 years after graduation. This sample condition is less strict and helps to increase the sample size substantially. If our main results are driven by a confounding change in sample composition, the marginal effects in Table 11 should diverge from those in Table 8 and Table 9.

However, as the results in column I and II show, the estimated negative relationship between labour market entry on a fixed-term contract and our fertility outcomes remains very robust. In fact, the larger sample size helps to increase the precision of the estimates. Already 3 years after graduation the likelihood of entering motherhood is around 6 to 7 percentage points lower among women who started on a fixed-term contract. This gap increases to more than 14 percentage points in year 5 after graduation. We observe a similar pattern for the results on the number of children: The marginal effects remain very similar to our main results while the standard errors become smaller. Hence, these results reveal a significant reduction in the number of children due to fixed-term employment at labour market entry.

Table 11 Sensitivity analysis II; 5 years balanced sample average marginal effects of Probit and Poisson regressions for FTC

Dependent Variable	First Birth		Number of Children	
	(I)	(II)	(III)	(IV)
after 3 years	-0.056*	-0.066**	-0.056*	-0.072**
	(0.030)	(0.028)	(0.034)	(0.033)
after 4 years	-0.084**	-0.091***	-0.087**	-0.097**
	(0.034)	(0.033)	(0.043)	(0.043)
after 5 years	-0.140***	-0.146***	-0.145***	-0.156***
	(0.036)	(0.034)	(0.049)	(0.048)
N	490	490	490	490
Personality traits & attitudes	YES	YES	YES	YES
Partnership status	NO	YES	NO	YES

Note: Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; female sample, no migrants; all regressions contain controls for individual characteristics, background characteristics, first job characteristics, state-of-first-job and year-of-graduation dummies.

In Table 12 we run three more robustness checks. First, partner's labour market status might be important for the decision to have children. Even if one's own contract is only fixed-term a permanent job arrangement of the partner enables a couple to have children. Second, we argue that economic uncertainty is the main channel explaining the negative estimates. Hence, specifying uncertainty explicitly in the regression equation should have an effect on the coefficients. As an objective measure of economic uncertainty we include in columns II and V local labour market conditions in the regressions (measured by the local unemployment rate). Finally, column III and VI directly control for the perceived level of job security at labour market entry.

Male partner controls are measured at the career start of the women and contain a dummy variable for not working and one for fixed-term employment. The local unemployment rate is measured on the level of 96 German "Raumordnungsregionen", an aggregation level between federal states and counties. Assuming that the initial type of contract has no influence on future unemployment rates, we include the unemployment rate lagged by one year (which is *z-1* in our notation). Finally, perceived job security takes on the value one if the individual is very concerned about the security of her job and zero otherwise. Note that the number of

observations drops slightly since SOEP does not provide regional identifiers for the first year (1995) in our sample. Similarly, sample size is reduced in columns I and IV since partner information is only available for cohabiting couples and job uncertainty is reported solely by working individuals (columns III and VI).

Table 12 Sensitivity analysis II; average marginal effects of Probit and Poisson regressions for FTC

Dependent Variable	First Birth			Number of Children		
Controls	(I) Partner's LM Status	(II) Lagged Unemployment Rate	(III) Perceived Job Uncertainty at LME	(IV) Partner's LM Status	(V) Lagged Unemployment Rate	(VI) Perceived Job Uncertainty at LME
after 5 years	-0.215***	-0.241***	-0.214***	-0.200**	-0.260***	-0.227***
	(0.067)	(0.045)	(0.060)	(0.098)	(0.081)	(0.077)
after 6 years	-0.154**	-0.163***	-0.158***	-0.143	-0.136	-0.161*
	(0.063)	(0.056)	(0.060)	(0.105)	(0.083)	(0.088)
after 7 years	-0.194***	-0.204***	-0.139**	-0.237**	-0.283***	-0.177*
	(0.059)	(0.057)	(0.065)	(0.101)	(0.097)	(0.102)
after 8 years	-0.225***	-0.213***	-0.153**	-0.209*	-0.317***	-0.242**
	(0.064)	(0.061)	(0.065)	(0.112)	(0.106)	(0.108)
after 9 years	-0.196***	-0.159**	-0.119*	-0.272**	-0.279**	-0.238*
	(0.069)	(0.063)	(0.068)	(0.124)	(0.111)	(0.123)
after 10 years	-0.228***	-0.186***	-0.146**	-0.317**	-0.324***	-0.305**
	(0.064)	(0.063)	(0.067)	(0.125)	(0.125)	(0.133)
N	181	237	248	181	237	248

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, first job characteristics, personality traits and attitudes, partnership status, state-of-first-job and year-of-graduation dummies.

Without any formal test the estimated coefficients in Table 12 seem to be similar in sign and size to the estimates in Table 8 and Table 9 respectively. On average the associations between starting the career on a fixed-term position and the fertility outcomes are even stronger controlling for partner's labour market status when entering the labour market and including the lagged regional unemployment rate. One possible explanation is that uncertainty becomes lower when the partner has a permanent contract or the opportunity costs shrink when the labour market conditions are unfavourable. The estimates in columns III and VI are very similar to those in the main specification. This implies that the negative effect of fixed-term employment at the beginning of the career cannot solely be explained by contemporaneous subjective job uncertainty due to the type of the first contract. We argue that the mechanism

depends more on the continued job and economic uncertainty which is due to the path dependence of starting the career in a fixed-term job and which individuals might not anticipate when entering the labour market. Repeated spells in temporary employment and the associated economic uncertainty induces women to postpone childbearing. [23]

4.4 Health outcomes

The estimated coefficients of starting the career with a fixed-term contract in equation (2) are reported in Table 13 for the main scales of mental and physical health. The results illustrate that physical health is not affected at all by the type of the first contract. However, mental health appears to react to spells of temporary employment at the beginning of the career. Women report significantly lower mental health at least in the short run. While in the first job or in the first years of their careers, economic uncertainty seems to depress the mental well-being of affected women. However, already 4 years after labour market entry the association becomes insignificant. In contrast, there is no significant association between starting the career on a fixed-term contract and mental or physical health among men. As a robustness check and to test for possible endogenous selection into fixed-term employment, we repeat the same analysis using the ex-ante health status as dependent variable (see last row of Table 13)[24]. Before entering the labour market women do not differ in their health status depending on the type of their (future) contract. This result makes us confident that women do not select into fixed-term contract based on the 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.

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[23] In a further robustness check, we also included field of study as an additional control variable and potential omitted variable. Field of study might be associated with a differential propensity to work on a fixed-term contract at the career start as well as with a differential propensity to postpone childbearing. As this information is often missing, this robustness test can only be performed on a very small subsample. Nevertheless, controlling for field of study only marginally affects the size of the coefficient of type of contract at career start. Hence, our results appear robust to this information. Outcome tables are available from the authors on request.

[24] In these robustness checks we do not include the ex-ante health conditions as explanatory variable (lagged dependent variable) as we do in the main health regression.

Table 13 Starting a career on 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 labour market entry (1st year)	-0.877 (1.257)	1.503 (1.395)	0.767 (0.810)	-0.439 (1.339)
after 2 years	-3.242** (1.337)	1.043 (1.658)	1.143 (1.134)	-1.381 (1.499)
after 3 years	-4.261*** (1.370)	1.569 (1.514)	0.480 (1.260)	-1.076 (1.101)
after 4 years	-1.421 (1.731)	1.004 (1.694)	0.215 (1.309)	0.221 (1.067)
after 5 years	0.304 (1.675)	1.643 (1.523)	0.907 (1.119)	-0.286 (1.228)
N	226	185	226	185
Baseline test: before labour market entry	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; all regressions contain controls for individual characteristics, background characteristics, first job characteristics, personality traits and attitudes, partnership status, ex-ante health status, state-of-first-job and year-of-graduation dummies.

The way SOEP provides health information allows us 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 health problems. 4. "Role emotional" is a variable which attains a low value if the respondents have accomplished less and have felt limited in the work or other activities due to mental and emotional problems. Table 14 reports the coefficients of starting the career on a fixed-term position at different stages after labour 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 two subsequent years, women appear to suffer from economic uncertainty. Advancing further in their career, however, the negative relationship fades out. 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.

Table 14 Marginal effects of starting the career on a fixed-term contract on mental health of women, by subcategories (OLS)

Dependent Variable	Mental Health	Vitality	Social Functioning	Role Emotional
	(I)	(II)	(III)	(IV)
at labour market entry (1st year)	-1.171	-0.692	-0.287	0.228
	(1.098)	(1.046)	(1.257)	(1.145)
after 2 years	-2.520*	-4.384***	-1.875	-0.738
	(1.419)	(1.281)	(1.266)	(1.345)
after 3 years	-4.300***	-4.784***	-1.772	-2.188
	(1.369)	(1.506)	(1.331)	(1.458)
after 4 years	-2.528	-1.510	0.383	-0.579
	(1.605)	(1.922)	(1.823)	(1.586)
after 5 years	-0.404	0.077	0.968	1.273
	(1.639)	(1.800)	(1.528)	(1.516)
N	226	226	226	226
Baseline test: before labour market entry	0.175	-0.467	1.855	1.033
	(1.791)	(1.865)	(1.688)	(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, first job characteristics, personality traits and attitudes, partnership status, ex-ante health status, state-of-first-job and year-of-graduation dummies.

Table 15 Marginal effects of starting the career on a fixed-term contract on mental health of men, by subcategories (OLS)

Dependent Variable	Mental Health	Vitality	Social Functioning	Role Emotional
	(I)	(II)	(III)	(IV)
at labour market entry (1st year)	0.607	-1.424	2.724**	1.314
	(1.328)	(1.173)	(1.343)	(1.362)
after 2 years	0.920	-1.761	0.399	1.093
	(1.789)	(1.619)	(1.871)	(1.467)
after 3 years	2.562	0.796	-0.425	-0.107
	(1.592)	(2.003)	(1.755)	(1.322)
after 4 years	1.810	0.314	0.317	-1.013
	(1.764)	(2.205)	(1.510)	(1.627)
after 5 years	1.836	-0.487	0.871	0.000
	(1.799)	(1.966)	(1.266)	(1.384)
N	185	185	185	185
Baseline test: before labour market entry	-3.758*	-3.334*	-2.255	-0.901
	(2.222)	(1.982)	(1.498)	(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, first job characteristics, personality traits and attitudes, partnership status, ex-ante health status, state-of-first-job and year-of-graduation dummies.

In contrast, we do not find any significant coefficients in the male sample (Table 15). The only exception is the positive (and contemporaneous) correlation with social functioning. Our baseline test for men again suggests potential differences in the health status before the labour market entry at least in columns (I) and (II).

Next, we turn our attention to different measures of well-being. Life and health satisfaction are the dependent variables in Table 16. Both, men and women are less satisfied with their lives when they enter the labour market with a temporary instead of a permanent job. However, this negative relationship holds only in the first year and becomes negligible and insignificant one year later. Turning to the second subjective well-being measure, our 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 5 years when they started their career on a fixed-term contract. One possible explanation can be that these women also have a lower propensity to have children which might in turn improve health and satisfaction (see Kohler, Behrman, Skytthe 2005).

Table 16 Marginal effects of starting the career on a fixed-term contract on life and health satisfaction (OLS)

Dependent Variable	Life Satisfaction		Health Satisfaction	
	(I) Women	(II) Men	(III) Women	(IV) Men
at labour market entry (1st year)	-0.326**	-0.337*	-0.038	-0.069
	(0.149)	(0.175)	(0.200)	(0.178)
after 2 years	-0.007	-0.205	0.162	0.109
	(0.153)	(0.182)	(0.165)	(0.200)
after 3 years	-0.117	-0.187	0.285	-0.226
	(0.151)	(0.155)	(0.174)	(0.189)
after 4 years	-0.160	-0.083	0.201	0.228
	(0.169)	(0.162)	(0.187)	(0.190)
after 5 years	-0.112	-0.045	0.527***	-0.100
	(0.158)	(0.156)	(0.185)	(0.199)
N	601	546	601	548
Baseline test: before labour market entry	-0.106	-0.182	-0.237	-0.109
	(0.153)	(0.201)	(0.185)	(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, first job characteristics, personality traits and attitudes, partnership status, ex-ante health status, state-of-first-job and year-of-graduation dummies.

To sum up, in the very short run we find a negative association between starting the career on a fixed-term basis and mental health, but only for women. This finding does not seem to be driven by people with worse ex-ante health conditions selecting into non-permanent jobs. A possible mechanism behind these findings might be a path dependence of starting the career on 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 reduce the mental condition of these women. The fact that the gap in mental health closes after a few years, might then be either related to these women adapting to uncertain circumstances or finding permanent jobs.

5. Further Heterogeneity Analysis and Results for Men

5.1 Fertility analysis: Results by education

In this section we investigate whether starting a career on a fixed-term contract affects fertility outcomes of women differently depending on their level of education. In particular, we compare women with secondary education and tertiary education. Therefore, we split our full sample (including women with migratory background) into two subsamples consisting of a) all women who attained middle vocational training or vocational training and 'Abitur' (ISCED codes 3 and 4) and b) all women with higher vocational training or a university degree (ISCED codes 5 and 6).[25] The main rationale behind this is that women with high educational attainment, such as a university degree, enter the labour market relatively late but face the same 'biological age restrictions' as women finishing their education at younger ages. Hence, the scope for a postponement is much more restricted for higher educated women. Furthermore, for older women it becomes comparatively more risky to postpone childbearing due to biological constraints. Thus, conditional on a particular intended number of children, we would expect a smaller postponement effect of fixed-term employment for women with

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[25] In the residual group are women who dropped out of school or do not have any vocational training at all.

higher education. Table 17 reports the average marginal effects by educational subgroup for selected years. As hypothesized, the postponement effects are stronger for women with secondary education: the coefficients are strongly negative and highly significant. For instance, 5 years after graduation the first birth probability is reduced by almost 24 percentage points if the first contract had a limited duration. The magnitude of the effect varies slightly over time but remains statistically significant, even 10 years after. In contrast, the point estimates for women with tertiary education are smaller and only rarely significant. Regarding the number of children we find a similar picture: starting the career on a fixed-term contract significantly reduces the realized number of children for women with secondary education. For women with a university degree the economic uncertainty associated with starting a career on a fixed-term contract does not seem to play such a crucial role for the timing of the first child and the number of children in the first 10 years after their graduation. The estimates are sizeable but much smaller and we are not able to estimate the coefficients precisely enough to distinguish them from a zero-effect. Even though, a formal test is not easily applicable in this setting, the wide confidence intervals suggest that the coefficients are not statistically different between the two groups. These findings are in line with our expectations that relatively old university graduates are not able to postpone parenthood in the same way as younger women do.

Table 17 Heterogeneity analysis; average marginal effects of Probit and Poisson regressions for FTC by education

Dependent Variable	First Birth		Number of Children	
Sample	(I) Secondary Education	(II) Tertiary Education	(III) Secondary Education	(IV) Tertiary Education
after 5 years	-0.236***	-0.095*	-0.277*	-0.147
	(0.050)	(0.053)	(0.148)	(0.152)
after 7 years	-0.335***	-0.014	-0.308***	-0.110
	(0.091)	(0.031)	(0.107)	(0.203)
after 10 years	-0.279**	-0.112	-0.348**	-0.092
	(0.112)	(0.115)	(0.145)	(0.168)
N	204	141	204	141

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, first job characteristics, personality traits and attitudes, partnership status, state-of-first-job and year-of-graduation dummies.
Note that due to sample size problems the ML method cannot find a maximum in the standard specification; therefore, partnership status is removed from the specification.

5.2 Fertility analysis: Results for men

It is possible that entering the labour market on a fixed-term contract also affects fertility outcomes of men. The corresponding results are reported in Table 18.[26] The estimated association between temporary jobs and subsequent fertility outcomes are close to zero and statistically never statistically distinguishable from zero. Hence, the results indicate that men do not react as sensitive as women to economic uncertainty. One possible explanation can be that men do not suffer from fixed-term contracts in the long run since they easily find a permanent job even if they already have a child. In contrast, women who are responsible for the majority of child rearing first want to gain a foothold in the labour market before deciding to enter motherhood.

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[26] In the male sample the age at graduation cut-off is two years later than in the female sample since men on average graduate two years later and are not exposed to biological constraints regarding fertility. The male sample consists of 223 observations.

Table 18 Heterogeneity analysis II; average marginal effects of Probit and Poisson regressions for FTC

Dependent Variable	First Birth		Number of Children	
	(I)	(II)	(III)	(IV)
after 5 years	0.077	0.070	0.178	0.116
	(0.070)	(0.064)	(0.155)	(0.122)
after 7 years	-0.012	-0.038	0.158	0.103
	(0.079)	(0.072)	(0.165)	(0.140)
after 10 years	-0.023	-0.052	0.078	-0.003
	(0.080)	(0.068)	(0.171)	(0.136)
N	225	225	225	225
Personality traits & attitudes	YES	YES	YES	YES
Partnership status	NO	YES	NO	YES

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; male sample, no migrants; all regressions contain controls for individual characteristics, background characteristics, first job characteristics, state-of-first-job and year-of-graduation dummies.

5.3 Heterogeneous health effects by education and gender

We also analyse potential differences in mental health outcomes between gender and education subgroups (Table 19). Women who start their career on a fixed-term position and have not obtained a university degree (column I) are the most affected group. The association is pronounced and remains significant until 5 years after graduation.[27] In contrast, we find no significant effects among women with higher education. Furthermore and surprisingly, men with secondary education display a significantly higher mental health status when they started their career on a temporary job. This is completely the opposite of what we observe for women. Whether this finding can be explained by certain labour 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 not to be affected by the type of contract in their first job.

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[27] In fact, the coefficient 4 years after labour market entry is not statistically different from zero but economically sizeable. Probably the large positive coefficient in group of tertiary educated women causes the estimates in the full sample 3 to 5 years after labour market entry to be small and insignificant.

Table 19 Heterogeneity analysis for mental health outcomes (OLS)

Sample	Women		Men	
	(I) Secondary Education	(II) Tertiary Education	(III) Secondary Education	(IV) Tertiary Education
at labour market entry (1st year)	-1.458 (1.662)	-1.659 (2.649)	3.679 (2.279)	2.625 (2.237)
after 2 years	-4.629** (1.937)	-1.609 (2.992)	4.143* (2.383)	-0.021 (3.478)
after 3 years	-5.421** (2.409)	-0.921 (2.118)	6.559** (2.445)	-0.439 (4.083)
after 4 years	-4.030 (2.945)	3.859 (2.402)	8.605*** (2.831)	-0.190 (3.804)
after 5 years	-5.071** (2.456)	4.754 (2.900)	7.930** (3.175)	4.448 (3.157)
N	134	86	113	68
Baseline test: before labour market entry	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, first job characteristics, personality traits and attitudes, partnership status, ex-ante health status, state-of-first-job and year-of-graduation dummies.

5.4 Mechanism

Finally, focusing on the mechanisms, we now test whether the negative association of fixed-term employment at career start and fertility is driven by the lower wage of temporary jobs and a lower attractiveness on the marriage market. From section 2 we know that starting the career on a fixed-term contract is associated with lower wages which in turn may cause the reduced fertility. So far, we have already controlled for many wage predictors. Now, we re-estimate our main specification controlling explicitly for monthly net wages of the first job (columns I and IV in Table 20).[28] If wages and their profile over time are the main channel through which fixed-term jobs affect fertility the coefficient of fixed-term employment should become much smaller and even insignificant. However, the results in Table 20 are closely comparable to our main estimates in Table 8 and Table 9. This indicates that it is not the lower income of the first job per sé which induces women to postpone childbearing but

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[28] Unemployed individuals are assigned a zero wage.

probably the economic uncertainty during the first years on the labour market (path dependence) associated with temporary contracts.

Table 20 Mechanism I; average marginal effects of Probit and Poisson regressions for FTC

| Dependent Variable	First Birth			Number of Children		
	(I)	(II) Married at Labour Market Entry	(III) Cohabiting at Labour Market Entry	(IV)	(V) Married at Labour Market Entry	(VI) Cohabiting at Labour Market Entry
Additional Controls	Wage of first Job			Wage of first Job		
after 4 years	-0.116**	-0.120***	-0.137***	-0.119		
	(0.047)	(0.045)	(0.044)	(0.144)		
after 5 years	-0.168***	-0.178***	-0.183***	-0.178**	-0.183**	-0.205**
	(0.047)	(0.045)	(0.043)	(0.071)	(0.086)	(0.104)
after 6 years	-0.130**	-0.142***	-0.142***	-0.091	-0.111	-0.124
	(0.054)	(0.051)	(0.051)	(0.087)	(0.085)	(0.158)
after 7 years	-0.143**	-0.137**	-0.141**	-0.141	-0.160*	-0.166*
	(0.058)	(0.058)	(0.058)	(0.095)	(0.096)	(0.090)
after 8 years	-0.147**	-0.136**	-0.136**	-0.187*	-0.191*	-0.175*
	(0.062)	(0.062)	(0.062)	(0.102)	(0.102)	(0.096)
after 9 years	-0.122*	-0.110*	-0.115*	-0.212*	-0.213*	-0.208*
	(0.063)	(0.064)	(0.062)	(0.112)	(0.111)	(0.109)
after 10 years	-0.129**	-0.122*	-0.124**	-0.245**	-0.261**	-0.243**
	(0.063)	(0.064)	(0.062)	(0.119)	(0.117)	(0.116)
N	267	267	267	267	267	267

Note: Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; female sample, no migrants; all regressions contain controls for individual characteristics, background characteristics, first job characteristics, personality traits and attitudes, partnership status, state-of-first-job and year-of-graduation dummies.

Another potential channel is lower attractiveness on the marriage or partner market. Women in fixed-term employment could be less attractive for men and therefore less likely to have a suitable partner to form a family. In the standard specifications in the last columns of Table 8 and Table 9 we control for partnership status at labour market entry to account for this channel. Replacing our original control variable "having a partner" by "being married" or "living together" at labour market entry seems to have no substantial effect on the correlation between starting the career on a fixed-term contract and fertility outcomes. Columns II, III and V, VI show that the coefficients are only slightly different from the ones estimated earlier. In particular column II in Table 8 is very similar to the results here, meaning that cohabitation or marriage does not alleviate the uncertainty caused by temporary employment. If anything,

having a partner seems to matter for the way how economic uncertainty influences fertility decisions.

We propose that neither the lower income nor the lower attractiveness on the partner market are the driving mechanism for the negative association but the economic uncertainty attached to the path dependence of starting the career on a fixed-term contract. Instead, we argue that the initial temporary contract worsens the career path of young women. The lower career prospects in turn induce women to defer motherhood. Thus, our results reflect an indirect effect of starting the career on a fixed-term job via reduced labour market opportunities and outcomes during the first years on the labour market. Figure 1 shows the frequency of temporary job holdings by type of initial contract over the first 10 years in the labour market (only women in the fertility sample). While in the second year almost 50 per cent of women on an initial temporary contract hold a contract with limited duration, this number permanently declines over time. Nevertheless, in the first 5 years repeated spells in fixed-term employment for this group of women seem to be quite common. Women who start their careers with a regular contract have for the whole period a much lower probability of working under a fixed-term contract. We call that "path dependence".

Figure 1 Fixed-term employment spells by initial type of contract (native women without children)
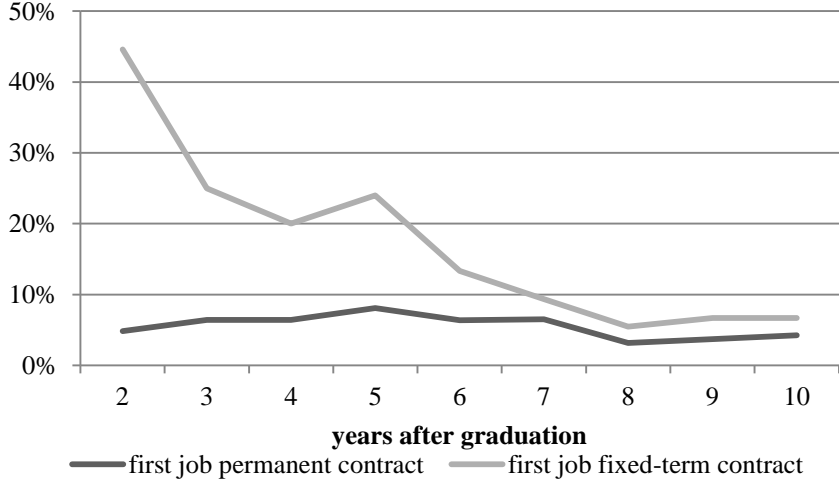
Note: The graph is built on the main sample of native women. To correct for feedback effects of child birth we additionally restrict the sample to women without children.

In the regression framework Table 21 reports marginal effects of the type of the initial contract on the type of contract in year z after graduation. The first two columns are based on the fertility sample, the latter two on the health sample. Concerning the difference, one should keep in mind that the sample restrictions are somewhat different (for details, see section 3.1). The inclusion of first job characteristics in column II has no substantial effect on the size of the estimates. The development indicates a strong persistence in temporary employment at least over the first 5 years on the labour market. Controlling for first job characteristics, we estimate a 20 percentage points higher probability to hold a fixed-term contract even 5 years after the first job. We argue that this path dependence is the main forces which creates economic uncertainty for the affected women and induces them to postpone entering motherhood and as a result to have on average fewer children than women with a permanent first job. Since the large majority of women have found a permanent job after 5 years, estimations are not possible beyond this point.

Table 21 Mechanism II; average marginal effects of Probit regressions for FTC

Dependent Variable	Future Fixed-term Contract			
	(I)	(II)	(III)	(IV)
Sample	Fertility Sample Women	Fertility Sample Women	Health Sample Women	Health Sample Men
after 2 years	0.464***	0.448***	0.344***	0.476***
	(0.036)	(0.037)	(0.069)	(0.097)
after 3 years	0.329***	0.299***	0.126*	0.250**
	(0.068)	(0.071)	(0.069)	(0.101)
after 4 years	0.196***	0.221***	0.023	0.194**
	(0.058)	(0.056)	(0.060)	(0.083)
after 5 years	0.184***	0.242***	0.079	0.078
	(0.064)	(0.069)	(0.062)	(0.059)
First job characteristics	NO	YES	YES	YES

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; female sample, no migrants; all regressions contain controls for individual characteristics, background characteristics, personality traits and attitudes, partnership status, state-of-first-job and year-of-graduation dummies.

The pattern is similar but less pronounced in columns III and IV. For women the path dependence seems to be less distinctive than for men. That is remarkable since women react much stronger than men and report substantially lower medical conditions as seen in our main results. All in all, the type of the first contract largely determines the progression of the career

in the first years on the labour market. Starting with a fixed-term contract is associated with career uncertainties which in turn have negative spill-over effects on other domains of live.

6. Conclusion

In countries with strong employment protection legislations fixed-term contracts are meant to increase the flexibility of the recruitment process and are thought to foster employment in general. However, existing evidence suggests that fixed-term contracts lead to a dual labour market and casts doubt on the notion that temporary contracts help to foster employment and to reduce aggregate unemployment in the long-run (Cahuc and Postel-Vinay 2002; Bentolila and Dolado 1994; Boeri and Garibaldi 2007).

Our analysis sheds light on potential spill-over effects of fixed-term employment on fertility and health outcomes. Using data on young female graduates for Germany, we find a significant postponement of first birth and a reduction in the number of children in the first 10 years after graduation. These results are robust to several sensitivity tests. Furthermore, we show that fixed-term employment at the beginning of the career leads to lower mental health status of women in the short run but has no effect starting from the fourth year after labour market entry. A possible explanation is the economic uncertainty associated with the path dependence of starting the career in fixed-term employment. The likelihood of repeated spells in precarious jobs is significantly higher when entering the labour market on a temporary contract. Thus, we measure an indirect effect of initial contract on fertility and health which works through recurrent contemporaneous economic instabilities. The relationship is estimated based on a sample of (childless) female graduates younger than 31 years (35 in the health sample) who enter the labour market on a fixed-term contract. Assuming that – conditional on observables – fixed-term contracts at the beginning of the career are randomly assigned to the working population our results can be interpreted as consistent estimators of the average treatment effect on the treated. The heterogeneity analysis reveals that women

with secondary education are particularly affected. In contrast, our results do not reveal any significant and robust correlations between job uncertainty at the beginning of a career and fertility and (mental) health for young men. We address potential endogeneity threats by including a large set of controls and by showing evidence against fertility 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, we believe that the results do suggest a robust negative relationship between fixed-term employment and fertility as well as fixed-term employment and mental health in the short-run for the subpopulation of women.

Our study has important implications for policy makers in low-fertility countries as our findings highlight negative spill-over effects of temporary employment on demographic and health outcomes. Fixed-term contracts might facilitate labour market entry of older persons and the long-term unemployed (stepping-stone hypothesis), but they seem to impede the integration of young graduates in the labour market and to negatively affect fertility and mental health of women. As such, this labour market policy imposes a disproportionate burden on the young generation, and especially women. Against this background, policy makers should possibly reconsider the costs and benefits of this policy instrument and should strive for a more equal distribution of the costs associated with employment protection across population subgroups. A possible approach could be a broader reform of the employment protection legislation, i.e. equalising the dismissal costs for all workers (Blanchard and Landier 2002).

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Appendix

Table A1 Probability of starting a career with a fixed-term contract; average marginal effects (Probit)

Sample	(I) Native Women	(II) Native Women	(III) All Women	(IV) All Women
Age at graduation	0.031**	0.023	0.022*	0.018
	(0.015)	(0.015)	(0.013)	(0.012)
Years of education	0.017	0.012	0.004	0.002
	(0.016)	(0.016)	(0.014)	(0.014)
Born in East Germany	0.119	0.082	0.041	0.029
	(0.121)	(0.111)	(0.119)	(0.106)
High education mother	-0.103	-0.107	0.051	0.033
	(0.088)	(0.085)	(0.096)	(0.093)
Employment mother	-0.123	-0.119	-0.132	-0.135
	(0.123)	(0.118)	(0.101)	(0.092)
Age at birth mother	0.004	0.006	-0.000	0.001
	(0.007)	(0.007)	(0.006)	(0.005)
Number of siblings	0.047	0.067	0.031	0.034
	(0.085)	(0.080)	(0.079)	(0.077)
Openness	0.010	0.016	0.022	0.030
	(0.033)	(0.032)	(0.027)	(0.026)
Agreeableness	-0.051	-0.042	-0.035	-0.032
	(0.038)	(0.036)	(0.031)	(0.030)
Conscientiousness	-0.004	-0.013	-0.017	-0.029
	(0.046)	(0.044)	(0.035)	(0.033)
Extraversion	-0.032	-0.029	-0.012	-0.015
	(0.033)	(0.030)	(0.026)	(0.025)
Neuroticism	0.027	0.006	0.022	0.007
	(0.040)	(0.041)	(0.036)	(0.035)
Risk aversion	-0.134	-0.173**	-0.152*	-0.165**
	(0.098)	(0.084)	(0.080)	(0.072)
Locus of control	-0.037	0.000	-0.049	-0.035
	(0.055)	(0.054)	(0.047)	(0.045)
Importance of having children	0.128*	0.090	0.060	0.022
	(0.074)	(0.077)	(0.065)	(0.068)
Importance of partnership	-0.027	0.121	0.049	0.156
	(0.229)	(0.146)	(0.159)	(0.100)
Importance of career	-0.043	0.002	-0.036	0.008
	(0.117)	(0.110)	(0.089)	(0.081)
Importance of affording something	0.019	0.003	-0.016	-0.032
	(0.101)	(0.099)	(0.092)	(0.092)
In Partnership after graduation		0.078		0.148*
		(0.123)		(0.090)
First job blue collar		0.943***		0.949***
		(0.038)		(0.032)
First job manufacturing		0.961***		0.969***
		(0.034)		(0.026)
First job trade and transportation		0.938***		0.916***
		(0.044)		(0.041)
First job financial services		0.997***		0.997***
		(0.010)		(0.007)
First job public and other services	0.063	0.048	-0.012	-0.013
	(0.070)	(0.071)	(0.059)	(0.058)
N	267	267	363	363

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; female working sample, ; all regressions contain state-of-first-job and year-of-graduation dummies.

Table A2 Probability of first birth 5 years after graduation; average marginal effects (Probit)

	(I)	(II)	(III)
First Job fixed-term contract	-0.152***	-0.182***	-0.195***
	(0.052)	(0.044)	(0.043)
Unemployment after graduation	0.649***	0.645***	0.623***
	(0.027)	(0.028)	(0.045)
Age at graduation	0.034***	0.038***	0.037***
	(0.012)	(0.011)	(0.011)
Years of education	-0.036***	-0.041***	-0.040***
	(0.013)	(0.012)	(0.012)
Born in East Germany	0.071	0.083	0.065
	(0.100)	(0.093)	(0.094)
High education mother	-0.007	-0.002	-0.026
	(0.092)	(0.082)	(0.078)
Employment mother	0.112	0.064	0.069
	(0.127)	(0.119)	(0.115)
Age at birth (mother)	-0.004	-0.007	-0.007
	(0.006)	(0.005)	(0.005)
Number of siblings	0.035	0.066	0.064
	(0.077)	(0.075)	(0.072)
Openness		-0.018	-0.007
		(0.022)	(0.021)
Agreeableness		-0.017	-0.031
		(0.029)	(0.028)
Conscientiousness		-0.039	-0.035
		(0.032)	(0.031)
Extraversion		0.027	0.014
		(0.024)	(0.023)
Neuroticism		-0.019	-0.033
		(0.031)	(0.030)
Risk aversion		0.117	0.108
		(0.087)	(0.081)
Locus of control		-0.031	-0.025
		(0.040)	(0.038)
Importance of having children		0.215***	0.225***
		(0.060)	(0.060)
Importance of partnership		0.143	0.053
		(0.166)	(0.171)
Importance of career		-0.157*	-0.151*
		(0.083)	(0.080)
Importance of affording something		-0.019	0.001
		(0.086)	(0.083)
First job blue collar	0.121	0.116	0.125
	(0.104)	(0.098)	(0.096)
First job manufacturing	1.384***	1.409***	1.278***
	(0.152)	(0.159)	(0.163)
First job trade and transportation	1.398***	1.426***	1.293***
	(0.163)	(0.172)	(0.170)
First job financial services	1.362***	1.397***	1.225***
	(0.162)	(0.173)	(0.174)
First job public and other services	1.541***	1.564***	1.395***
	(0.160)	(0.170)	(0.172)
In Partnership after graduation			0.190***
			(0.051)
N	267	267	267

Note: Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; female sample, no migrants; all regressions contain state-of-first-job and year-of-graduation dummies.