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From employment to engagement? Stable jobs, temporary jobs, and cohabiting relationships

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ABSTRACT

Family formation has been substantially delayed in recent decades, and birth rates have fallen below the replacement rates in many OECD countries. Research suggests that these trends are tightly linked to recent changes in the labor market; however, little is known about the role played by increases in job insecurity. In this paper, I investigate whether the type of employment, stable or temporary, affects the timing of cohabitation and fertility. Using French data on the work and family history of large samples of young adults, I provide evidence that being permanently employed has a much stronger effect than being in temporary employment on the probability of entering a first cohabiting relationship as well as on the probability of having a first child. These findings suggest that increases in age at first cohabitation and at first child can partly be explained by the rise in unemployment and in the share of temporary jobs among young workers.

1. Introduction

Over the last half century family formation and family structures have changed substantially: median age at first marriage or cohabitation has increased; more and more individuals are living alone; first births are postponed; and birth rates have fallen below the replacement rate in many OECD countries.[2] While several papers have provided evidence that these sweeping changes have technological, social and legal roots, with for example the introduction of the birth control pill, changes in abortion laws (e.g., see Goldin and Katz, 2002 and Myers, 2017), or increases in educational attainments (e.g., see Aaronson et al., 2014), there is also evidence that these changes in family structures and family formation are tightly linked to changes in the labor market. Most of this research has focused on the role of increases in women labor force participation and decreases in the pool of "marriageable men".[3] Much less is known about the consequences of job insecurity for family formation, despite the fact that there has been a large increase in job insecurity in recent decades.[4] This paper aims at filling this gap by studying whether the type of employment, stable or temporary, affects the timing of cohabitation and fertility. To investigate the differential effects of stable and temporary jobs on family formation, I take advantage of a French survey with detailed information on the dynamics of employment and family formation to estimate a semi-parametric timing-of-events model (Abbring and van den Berg, 2003) exploiting conditional random variation in the timing of first stable and temporary jobs.

A large body of research has investigated the links between education and family formation. In particular, several papers have highlighted that increases in compulsory education contributed to delaying first births, especially through decreases in teenage pregnancy (e.g., see Aaronson et al., 2014; Black et al., 2008; Monstad et al., 2008; Oreopoulos and Salvanes, 2011). Increases in education also contributed to decreasing fertility (e.g., see Cygan-Rehm and Maeder, 2013; Lavy and Zablotsky, 2015; McCrary and Royer, 2011). Overall, increases in educational attainments during the second half of the 20th century, especially among women, have delayed family formation and fertility decisions (e.g., see Brand and Davis, 2011; Rindfuss et al., 1996); and delayed

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[2] E.g., see Lundberg and Pollak (2007) or Stevenson and Wolfers (2007) on the evolutions of American families, and OECD (2011) for changes in family structure and formation in OECD countries.

[3] E.g., see Blau and Winkler (2011) for a review of this literature.

[4] The share of temporary employment in total employment has increased by 65% in Europe between 1990 and 2017 for men and women aged 15 to 24 years old (see OECD, temporary employment indicators).

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family formation and fertility further enabled increases in women's education (e.g., see Goldin, 2006). After finishing their education most individuals do not find their first job instantaneously, and over the past decades it has become increasingly difficult for young adults to find a first stable job after leaving school. In France for example, the unemployment rate has increased by about 30% between 1990 and 2014 for individuals who finished their initial schooling 1 to 4 years earlier. At the same time, for those who found a job, the share of temporary contracts also increased by about 30% (see INSEE, 2020). Did this increasing duration between the end of schooling and entry into stable employment, due to increases in youth unemployment but also to increases in the share of temporary contracts, also played a role in explaining observed delays in family formation and fertility? This paper aims at shading light on this question by studying whether entry into employment impacts family formation, and whether stable and temporary jobs have different implications for family formation.

Theoretically, it is not obvious whether stronger employment protection favors family formation. Temporary contracts stop automatically without any cost after a prespecified period, whereas it is very costly to terminate open-ended contracts. As a consequence, for a given wage, permanent contracts reduce earnings uncertainty compared with temporary contracts. This may impact individuals' probability of cohabitation and childbearing positively or negatively. On the negative side, as temporary jobs provide lower financial security, banks may be less willing to lend money to workers in temporary jobs compared with workers in permanent jobs. This may restrict temporary workers' ability to access independent housing. More generally, Santos and Weiss (2016) have developed a theoretical framework where income volatility delays marriage by making consumption commitments (such as children) less desirable. From a risk-sharing perspective however, the relationship between weaker employment protection and family formation may be positive. If individuals decide to engage in cohabiting relationships to insure themselves against income shocks, then we should expect a positive relationship between employment instability and the propensity to start cohabiting.

A long-standing strand of research has explored the empirical relationship between economic uncertainty and family formation.[5] Several papers have highlighted a strong and negative correlation between job insecurity and marriage or cohabitation on the one hand (e.g., see Ekert-Jaffé and Solaz, 2001; Ekert-Jaffé and Solaz, 2002; Kalmijn, 2011; Mira and Ahn, 2001; Rica and Iza, 2005), and between job insecurity and fertility decisions on the other hand (e.g., see Adsera, 2004; Adsera, 2005; Adsera, 2011; Auer and Danzer, 2016; Pailhé and Solaz, 2012). However, causal evidence on these topics is scarce. Only two papers have provided causal evidence for the negative effect of job insecurity on women's fertility decisions (Prifti and Vuri, 2013 and Lopes, 2018). To the best of my knowledge, there is no causal evidence regarding whether permanent and temporary employment have similar implications for the decision to start cohabiting. This paper aims at making progress in this direction. Using detailed information on the work and family history of large representative samples of young French adults, I study whether being permanently employed has a stronger effect on the probability of entering a cohabiting relationship than being in temporary employment. In addition, I analyze whether the relationship between being permanently employed and the decision to start cohabiting may explain the negative effect of job insecurity on fertility decisions. Marriage no longer seems to be a prerequisite for childbirth.[6] However, most couples wait until they live together to have a first child. In 2015, e.g., about 90% of children from 0 to 2 years old in France were living with both parents.[7] Therefore, understanding whether and how employment status impacts cohabitation may be important for understanding the negative relationship between job insecurity and fertility decisions.

This paper also contributes to the empirical literature on youth unemployment and family formation. This literature has focused mainly on the effect of employment relative to unemployment or inactivity on the decision to start a family and does not distinguish between permanent or temporary job positions.[8] In particular, Lillard and Waite (2000), Aassve et al. (2006), and Niedergesäss (2013) study the relationship between employment, cohabitation or marriage, and fertility using a methodological framework very similar to mine. These three papers use Lillard's simultaneous hazard model (Lillard, 1993) and find a positive effect of employment on marriage or cohabitation for men, and a negative effect for women (the exception is Aassve et al. (2006) who find a positive effect for both genders). In addition, they find no evidence of a positive or negative effect of marriage (or cohabitation) on employment for men, but they find a negative effect for women. Relative to this literature, the main contribution of my paper is to focus on the differential effect of stable and temporary jobs. The idea that employment protection hinders job creation and thereby explains high unemployment rates has gained momentum in recent decades. Consequently, several European countries have implemented public policies favoring temporary contracts or weakening the job security associated with open-ended contracts.[9] The empirical literature studying the consequences of such policies has focused mainly on their direct impact on individuals' earnings and employment trajectories.[10] However, it is important to understand whether temporary jobs have similar implications as stable jobs for cohabitation and fertility decisions to grasp the full consequences of public policies favoring more flexible labor markets.

It is empirically challenging to assess whether the timing of employment explains the timing of family formation and to estimate the differential impact of stable and temporary jobs. Individuals who find a stable or temporary job sooner are likely to have unobserved characteristics that may also influence the timing of their cohabiting relationship (selection) and the three transitions may impact each other (reverse causality). To overcome these issues and make progress toward identifying causal effects, I use the multivariate mixed proportional hazard rate model of Abbring and van den Berg (2003). Under the no-anticipation assumption, Abbring and van den Berg show that this empirical model enables to estimate causal effects in a dynamic setting where treatments and outcomes are duration variables, even when their timings are affected by correlated time-constant unobserved characteristics. More recently, Gaure et al. (2007) showed with Monte-Carlo experiments that Abbring and van den Berg empirical approach is able to accurately separate the causal effects of dynamically assigned treatments from sorting effects, and this empirical model has been used in various settings (e.g., see van den Berg et al., 2004, Abbring et al., 2005, van Ours, 2006, Jahn and Rosholm, 2014 or Moschion and van Ours, 2019). However, to my knowledge this paper is the first to use this method to estimate the differential effects of stable and temporary jobs on family formation.

To disentangle causality from selection, Abbring and van den Berg's duration model includes potentially correlated unobservable characteristics impacting the timing of the different events of interest, and estimate their joint distribution simultaneously with the parameters of interest. In this setting, identification relies on comparing individuals with similar observed and unobserved characteristics, but different with respect to the timing of their first stable or temporary jobs. Intuitively, the idea is to estimate whether one event systematically occurs shortly after another event no matter when the first event occurs, as selection

[5] The literature documenting the importance of income and favorable job circumstances for family formation and fertility also includes several papers on job loss and divorce, such as Charles and Stephens (2004); Marinescu (2016); Rege et al. (2011) for example.

[6] The share of births outside of marriage has increased from 7.2% to 39.7% over the last 40 years in OECD countries (OECD Family Database).

[7] Source: INSEE, Population census.

[8] See e.g., Bono et al. (2012) or Bono et al. (2015) on the negative impact of job displacement for women's fertility decisions.

[9] See Boeri (2011).

[10] See Boeri et al. (2015) for a review of the impact of employment protection legislation on labor market outcomes.

would imply a strong correlation between both timings but not a quick succession of events (see Abbring and van den Berg, 2004).

The main goal of my empirical analysis is to highlight that stable jobs have different effects than temporary jobs on the likelihood to start a family. In this context, it is key for my estimation strategy that individual do not intensify (with success) their job search differentially between stable and temporary jobs before their first cohabitation, in anticipation of this event. To increase the plausibility of this assumption, I exclude from my empirical analysis individuals who obtained their first jobs in the same year as their first cohabiting relationship. I also present graphical evidence that their is no Ashenfelter's dip in the probability to enter a first stable or temporary job just before the first cohabiting relationship, which is suggestive that violations of the no-anticipation assumption is not of major concern for my analysis. Lastly, I study whether the estimated effects of stable and temporary jobs vary by educational attainments. As highly educated individuals are more likely to find a first job, especially a first stable job, shortly after intensifying their job search, if the no-anticipation assumption was of concern, we would expect to find stronger effects of first stable jobs on first cohabiting relationships among individuals with higher levels of completed education. My heterogeneity analysis shows opposite results. In this context, even though it is impossible to be 100% sure that the no-anticipation assumption holds, it seems unlikely that violations of this identifying assumption are a major threat for my main findings.

My findings provide evidence that job stability has an impact on the probability to start a cohabiting relationship and on the probability to have a first child. First stable jobs multiply men's and women's instantaneous probability of entering a first cohabiting relationship by 3.9 and 3.5 times, respectively. By contrast, first temporary jobs multiply women's instantaneous probability of entering a first cohabiting relationship by 1.1 times only, with no significant impact for men. Being permanently employed also affects the probability of having a first child positively, both indirectly (through its effect on cohabitation) and directly, while being in temporary employment has no direct impact on fertility decisions and a much lower indirect impact. Overall, my results highlight that the decrease in the share of permanent employment among young workers likely explains part of observed delays in family formation in recent decades.

Previous studies have shown that job insecurity decreases overall fertility. In particular, Prifti and Vuri (2013) and Lopes (2018) show using natural experiments in Italy and Portugal respectively, that job insecurity negatively impacts women's probability to have a first child. However, the mechanisms through which job insecurity impacts fertility remain unclear. My results therefore complement these findings by providing a likely mechanism: I show that delayed stable employment delays cohabitation, and thereby also delays childbearing, which may result in a lower fertility, especially for women, as women's chances of having a child decrease with age.[11]

Furthermore, cohabitation is an interesting outcome in and by itself. In recent decades, the proportion of individuals living alone has increased, especially among young adults,[12] and a few studies have highlighted that living alone is associated with lower levels of happiness (e.g., see Chen and Ours, 2018; Verbakel, 2012). Understanding the determinants of living with a spouse vs. alone therefore seems an important question, and to my knowledge this paper is the first to highlight that entry into employment, and especially into stable employment, increases individuals ability to start a first cohabiting relationship.

The paper is organized as follows. Section 2 describes the institutional setting, the survey and the main variables of interest. Section 3 develops a graphical analysis based on an event study to describe how the probability of cohabitation evolves around the timings of the first stable or temporary jobs. Section 4 develops the main analysis using Abbring and van den Berg's timing-of-events methodology. Section 5 concludes.

2. Institutional context & data

To investigate whether stable and temporary jobs have similar implications for family formation, this paper uses the French survey *Families and Employers—FE* hereafter—conducted jointly in 2004–2005 by the French National Institute for Demographic Studies (INED) and the French National Institute for Statistical and Economic Studies (INSEE). This survey provides detailed retrospective information on the work and family history of 9547 representative individuals of the French population born between 1954 and 1985. These individuals entered the labor market for the first time between 1973 and 2004. The next sub-section provides information on the labor market legislation in France during this period.

2.1. Labor contracts in france: 1973–2004

In France, the labor market divide between very secure open-ended contracts and unstable temporary contracts started in the beginning of the 1970s. Until the beginning of the 1970s, open-ended contracts were by far the most prevalent labor contracts, but there were very few regulations on dismissals. Firms had to provide severance pay in case of unfair dismissals, but the burden of the proof laid with the employees. In 1973, a new legislation reversed this principle transforming open-ended contracts into secure employment contracts. Since then, firms have to justify dismissals by "real and serious reasons". From 1973 to 2004 new regulations were introduced to specify the content of "real and serious reasons" for dismissals, but the general principle remained that firms had to (1) provide long advance notice periods; (2) follow complex administrative procedures prior to dismissal; (3) provide severance pay. As a consequence, employment legislation for regular (open-ended) contracts in France were among the most protective of OECD countries during the period of interest (1973–2004).[13]

By contrast, temporary contracts in France (contracts with temporary work agencies or fixed-term contracts) offer much less employment security. In a context of economic crisis and increasing unemployment rates, successive French governments introduced temporary contracts into law to provide firms with the possibility to hire workers under less strict employment legislation protection. Contracts with temporary work agencies were first introduced into the French labor law in 1972, followed by fixed-term contracts in 1979. From 1979 to 2002, new regulations set into law the use, maximum duration, and maximum number of renewals of temporary contracts. Overall, temporary contracts could not be used on a long-term basis to fill permanent job positions, they would last for a prespecified period of time,[14] and could normally not be renewed. During the period of interest (1973–2004),

[11] Note however that my paper does not provide evidence on the links between job insecurity and fertility rates. My data and empirical method enable to study the timing of first cohabiting relationships and fertility decisions, but not completed fertility.

[12] In France for example, the proportion of 20–39 year olds living alone has increased by about 70% between 1990 and 2017 (see INSEE, 2020).

[13] See Nicoletti et al. (2000) and OECD employment protection indicators published in 2009 : from 1985 to 2004, France on average ranked among the top third countries for employment protection of regular contracts. Countries with a similar level of employment protection for regular contracts included Finland, Germany, Greece, and Norway; countries with stricter dismissal regulations for regular contracts included Austria, the Netherlands, Portugal, Spain, and Sweden; while dismissals were less regulated in countries such as Australia, Belgium, Canada, Denmark, Ireland, Italy, Japan, Switzerland, the UK, and the US. Additionally, the rules governing dismissals for regular contracts in France did not change substantially between 1973 and 1985.

[14] When first introduced into law, contracts with temporary agencies could only last for a maximum duration of 3 months. From 1979 to 1982, the maximum duration of temporary contracts (including a potential renewal) was set to one year, until it was limited to 6 months between 1982 and 1986. In 1986, the total maximum duration of temporary contracts was extended to 24 months. Lastly, in 1990 the maximum duration of standard temporary contracts was

regulations regarding temporary contracts in France were among the most strict of OECD countries, meaning that temporary contracts were very insecure.[15] Workers employed with temporary contracts were almost guaranteed to be in need of looking for a new job after the end of their (short) temporary contract.

To sum up, since the beginning of the 1970s, the French labor market is divided between very secure open-ended contracts and unstable temporary contracts. Bonnet et al. (2019) highlight that for similar individual characteristics, open-ended and temporary contracts usually offer similar wages. However, temporary contracts offer much less employment stability. To exemplify this difference in employment stability between open-ended and temporary contracts, Bonnet et al. (2019) shows that 80% of French workers employed with an open-ended contract in 2008 still worked in the same firm one year later, compared to 30% of workers employed with temporary contracts. They also highlight that few individuals (about 10%) employed through temporary contracts are carried over to an open-ended contract with the same employer. Being employed in a temporary position may however increase individuals' likelihood to find a permanent job position latter on with a different employer by improving individuals' work experience and resume.[16]

This division between very secure open-ended contracts and unstable temporary contracts is not specific to the French labor market: during the period of interest, Greece, Norway, Portugal, or Spain for example share the double characteristics of having very protected open-ended contracts together with short-term and mostly non-renewable temporary contracts.

In the following sections, the main research question will be whether stable jobs have different implication for family formation compared to temporary jobs. As open-ended contract provide much more stability compared with temporary jobs, they may enable individuals to form long term plans contrary to temporary job positions.[17]

2.2. Data

The *FE* survey provides detailed employment calendars in which individuals indicate their employment status for each year starting from age 18.[18] These calendars distinguish year-periods during which individuals had positions that lasted less than 6 months (hereafter temporary job positions) and year-periods during which they had at least one job that lasted more than 6 months (hereafter, stable job positions). Because the *FE* survey does not provide complete retrospective information on the type of contracts or on earnings, I use this information as proxy for temporary or open-ended contracts. During the period of interest, the legal maximum duration of temporary contracts varied from a minimum of 3 months up to a maximum of 24 months, but in the majority of cases the pre-specified duration of temporary contracts did not exceed 6 months.[19] By contrast, as dismissals of open-ended contracts became heavily regulated in 1973, most open-ended contracts lasted for more than 6 months.[20] In this context, whether a job lasted more or less than six month is likely a relevant proxy for labor contracts. Measurement errors can arise either from temporary contracts lasting more than 6 months, or from open-ended contracts lasting less than 6 months. If temporary contracts have a smaller effect on cohabitation and fertility than open-ended contracts, miscategorizing a temporary contract of more than 6 months into a permanent job will likely bias downward the estimated effects of permanent jobs on family formation. By contrast, miscategorizing open-ended contracts of less than 6 months will likely bias upward the estimated effects of temporary jobs on family formation, except if the reason why open-ended contracts lasted less than 6 months is related to family formation. In the *FE* survey, individuals are asked detailed information about their employment status at the timing of their first cohabiting relationship. If they were employed when they entered their first cohabiting relationship, the survey also provides detailed information about their job, including the types of contracts.[21] Using this information, I find that 68% of individuals were employed when they entered their first cohabiting relationship, 72% of them in an open-ended contract, 24% in a temporary contract, and the remaining 4% did not have an employment contract. For individuals employed in an open-ended contract we observe that their job lasted for less than 6 months in only 5% of cases, and for individuals employed in a temporary contract we observe that their job lasted for more than 6 months in 74% if cases. In this context, it seems likely that the main measurement errors come from miscategorizing temporary contracts into stable jobs, which should mostly bias the results against finding differential effects of temporary and stable jobs. As the empirical analysis aims at making the point that stable and temporary jobs have different implications for family formation, measurement errors therefore do not seem critical in my setting as they would play against us. Nevertheless, note that as a robustness test, I will also estimate my main econometric model using an alternative definition of stable and temporary jobs based on the maximum legal duration of temporary contracts over time.

Using information from the *FE* survey on job positions of 6 months or less and 6 months or more, I define the following two variables: t_S and $t_{\bar{S}}$, with t_S recording when individuals started their first stable job (i.e., t_S corresponds to the first year when individuals indicate that they were employed for more than 6 months), and $t_{\bar{S}}$ recording when individuals started their first temporary position (i.e., $t_{\bar{S}}$ corresponds to the first year when individuals indicate that they were employed or unemployed for less than 6 months).

With respect to family formation, individuals were asked to indicate the year when they started their first cohabiting relationship[22] as well as the months and years of birth of all their children. I use this information to construct the three following variables: t_F, t_B and t_C. The variable t_F indicates the year when individuals started their first cohabiting rela-

shortened to 18 months and this maximum duration remained until recent reforms in 2017.

[15] See Nicoletti et al. (2000) and OECD employment protection indicators published in 2009 : from 1985 to 2004, France on average ranked among the top quartile countries for its strictness of regulation on temporary contracts. Countries with a similar level of regulation on temporary contracts included Norway, Portugal, and Spain; countries with stricter regulations on temporary contracts included Belgium, Italy, and Greece; while temporary contracts were less regulated in countries such as Australia, Austria, Canada, Denmark, Finland, Ireland, Japan, the Netherlands, Switzerland, the UK, and the US. Between 1973 and 1985, regulations on temporary employment in France did not change much and were similarly strict. Noticeably, in most OECD countries except France, regulations on temporary contracts became less strict over time, such that France had the strictest regulations in 2004.

[16] About 50% of individuals employed with a temporary contract in 2008 are in a permanent job position 7 years later, 40% in a different firm and 10% in the same firm (Bonnet et al., 2019).

[17] I will further discuss potential mechanisms in Section 4.3.

[18] Individuals' work history was collected in a "year-period" format, so that it is possible to reconstruct the data as a yearly panel. Appendix B shows an example of the employment calendars provided with the data.

[19] From 1990 to 2004, 53% of temporary contracts were set for 6 months or less. Source: French Labor Force Survey 1990–2004.

[20] From 1990 to 2004, 72% of workers employed under an open-ended contract started more than 6 months ago, and this figure represents a lower bound due to left-censoring. Source: French Labor Force Survey 1990–2004.

[21] This information is asked to all individuals, in addition to the family and employment calendars, as the main purpose of the *FE* survey is to provide detailed information about the relationships between work and family life. Note that individuals' jobs when entering their first cohabiting relationship is not necessarily their first job.

[22] Cohabiting relationships include married and non-married couples, and my data does not contain similar retrospective information for marriage. Besides, in France since the 1970s most marriages start with a cohabiting relationship, such that cohabitation may appear as the first step for family formation (e.g., see Prioux, 2005).

tionship, t_B records the year when their first child is born, and t_C is a proxy for the year of conception of individuals' first child.[23]

Noticeably, t_S and $t_{\tilde{S}}$ are left censored at age 18 and t_S, $t_{\tilde{S}}$, t_F, t_B and t_C are right censored at the time of the survey. These five variables are also interval censored: i.e., the survey records during which years the events of interest occurred, but the exact timings are unknown. My empirical analyses takes into account these features.

For control variables, the *FE* survey provides information about whether and when individuals finished their initial schooling or adult education, individuals' highest diploma, their religious beliefs, year of birth, and age at residential independence. Additionally, I use publicly available information from the French Statistical Institute (INSEE) to control for yearly unemployment rates at the national level by gender and age groups, and to control for yearly rental price indexes at the national level.

I implement my graphical and timing-of-events analyses separately for men and women. Several studies have highlighted that family events, such as childbirth, have different implications for work trajectories across gender (see, e.g., Angelov et al., 2016; Kleven et al., 2018; Lundborg et al., 2017). As my analyses investigate simultaneously the effects of temporary or stable jobs on cohabitation and fertility, and the effects of cohabitation and fertility on first jobs, it seems important to allow for heterogeneous effects by gender. Besides, it seems interesting to study whether work events have different impacts for family life between men and women. Lastly, the *FE* survey was conducted at the household level, so in many cases men's and women's first cohabiting relationships and fertility events are not independent. If individuals' work trajectories are impacted by their spouses', or if the job status of one's spouse matters for cohabitation and parenthood, implementing my analysis on members of the same household could be problematic.

Regarding sample selection, I use two different samples: one for the graphical analysis and one for the timing-of-events.

The graphical analysis first focuses on the sample of men and women who have completed their initial schooling, have complete information regarding their retrospective calendars (schooling, employment, and family), and have experienced the event of interest by the time of the survey and after age 18.

Compared to the graphical analysis, the main analysis using Abbring and van den Berg's timing-of-events is restricted to individuals who did not experience the events of interest during the same year, but it includes individuals who never experienced the events of interest (i.e., this analysis includes individuals with right-censored information). In addition, to avoid left censoring, the Abbring and van den Berg analysis focuses on individuals who experienced every event of interest after age 18, and the analysis starts at age 18 and ends at the time of the survey or at age 35.[24]

I use different sample selection procedures for the graphical and timing-of-events analyses because of methodology constraints. The graphical analysis consists in comparing individuals before and after specific events, and therefore requires to focus on individuals who have experienced such events. The timing-of-events method does not require this restriction. However, for this methodology it is important to know in which order the events occurred, which is why I drop individuals who experienced the events of interest during the same year.

Table A1 provides information on the full sample of men and women with complete information, and Table 1 provides descriptive statistics of the subsamples used for the timing-of-events analyses. In addition, Table A2 in the Appendix shows the characteristics of individuals excluded from the timing-of-events analyses, i.e., individuals who experienced at least two events during the same year.

The different samples described in Tables 1 and A1 underline that most individuals had held a stable job by the time of the survey (89% to 92% of women depending on the specification, and 94% to 96% of men). A sizable proportion of individuals had also held a temporary job by the time of the survey (42% to 50% depending on the specification). Half of the men had entered a first stable job by age 20, half of the women by age 21, and half of the men and women had entered a first temporary job by age 20. Most individuals had also lived in a cohabiting relationship (84% to 90% of women and 76% to 83% of men) and had a child (69% to 77% of women and 56% to 65% of men). More women than men had lived in a cohabiting relationship and had a child because they entered cohabiting relationships and parenthood slightly younger (about 2 years before men). Most women entered their first cohabiting relationship by age 22, while the median age at first cohabiting relationship is 24 for men, and both men and women had their first child about 3 years latter (the median age at first child is 25 for women and 27 for men).[25] In terms of the relationship between first jobs and family events, most women had their first cohabiting relationship 2 years after their first stable or temporary job; while the median duration between the first stable job and the first cohabiting relationship is 3 years for men, and the median duration between their first temporary job and their first cohabiting relationship is 4 years. For men, the duration between the first cohabitation and the first stable job is shorter than the duration between the first cohabiting relationship and the first temporary job. For women the first cohabiting relationship occurs as shortly after a first stable job as after a first temporary job. This is also the case for fertility events: most women had a child 4 years after their first stable or temporary job, while most men had a child 6 years after their first stable job, and 7 years after their first temporary job.

To implement the timing-of-event method, we need to know in which order the events occurred. This means that I have to exclude individuals who obtained their first stable or temporary jobs, or entered their first cohabiting relationship during the same year, as I only have information at a yearly level. One question is whether this sample selection affects the results, and in which direction. To shed some light on this issue, Table A2 provides descriptive statistics on individuals with simultaneous transitions. By definition, individuals who experienced simultaneous transitions are more likely to have found a first stable or temporary job and a first cohabiting relationship. Coherently, they are also more educated, less religious, and they entered their first cohabiting relationship and had a first child younger.

Among individuals with simultaneous transitions, 44% declared that they held a stable job when they first started their first cohabiting relationship, and 29% declared that they held an unstable job. These proportions are respectively 46% and 12% in my working sample.[26]

[23] $t_C = t_B - 1$ for children born between January 1st and September 30th and $t_C = t_B$ for children born between October 1st and December 31st.

[24] In the initial sample, for each event, more than 95% of individuals who had experienced the event before the survey had experienced it by age 35. Note that as a robustness check, I will also implement my analyses using 40 years old as alternative age limit. An alternative initial date to age 18 would be the end of initial schooling. However, to avoid left censoring, this specification would require us to drop individuals who finished their initial schooling strictly before age 18, as we do not have information on individuals' employment before age 18. This represents about 25% of the working sample. For this reason, the main analysis uses age 18 as the initial date.

[25] Age at first stable job and age at first cohabitation have increased over time. For cohorts born in the mid-1950s, the median ages at first stable job and first cohabitation were 19 and 22, respectively. For cohorts born in the early 1970s, the median ages at first stable job and first cohabitation were 22 and 23, respectively. By contrast, the median age at first temporary job has remained stable at 21 between cohorts born in the mid-1950s and cohorts born in the early 1970s.

[26] These proportions correspond to individuals with/without simultaneous transitions for their first stable job, temporary job, or cohabiting relationship. For individuals with simultaneous transitions for their first stable job, temporary job, cohabiting relationship, or first child, 45% declared that they had a stable job before cohabiting, and 23% declared that they held a temporary job, compared to respectively 46% and 12% for individuals without simultaneous transitions.

Table 1
Descriptive Statistics — Timing-of-events analyses.

	Model (3)		Model (4)	
	First jobs and cohabiting relationships		First jobs, cohab. relationships, and fertility	
	Women (1)	Men (2)	Women (3)	Men (4)
Stable employment	0.89	0.95	0.90	0.94
	[0.31]	[0.22]	[0.30]	[0.23]
Med. age at first stable job	21	20	21	20
	[3.24]	[2.96]	[3.17]	[2.95]
Temporary employment	0.43	0.42	0.43	0.43
	[0.49]	[0.49]	[0.49]	[0.50]
Med. age at first temp. job	20	20	20	20
	[4.25]	[3.75]	[4.10]	[3.66]
Cohabiting relationship	0.86	0.79	0.84	0.76
	[0.35]	[0.41]	[0.37]	[0.43]
Med. age at first cohab. relationship	22	24	22	24
	[3.44]	[3.45]	[3.40]	[3.43]
Children	0.74	0.61	0.69	0.56
	[0.44]	[0.49]	[0.46]	[0.50]
Med. age at first child	25	27	25	27
	[4.04]	[3.72]	[3.75]	[3.45]
Residential independence	0.94	0.89	0.94	0.88
	[0.23]	[0.31]	[0.25]	[0.32]
Med. age at residential independence	21	23	22	23
	[3.44]	[3.94]	[3.46]	[4.00]
Med. school-leaving age	19	19	20	19
	[3.19]	[3.36]	[3.17]	[3.33]
Higher education	0.33	0.26	0.36	0.27
	[0.47]	[0.44]	[0.48]	[0.44]
Secondary education	0.18	0.15	0.18	0.16
	[0.38]	[0.36]	[0.39]	[0.36]
Strong religious beliefs	0.31	0.22	0.29	0.21
	[0.46]	[0.41]	[0.46]	[0.41]
N	3571	3505	3033	3158

Note: The table refers to the samples of men and women from the *FE* survey who finished initial schooling before the survey. Each column focuses on a different subsample of women or men. Columns (1) and (2) are restricted to individuals who did not start their first stable job, their first temporary job, or their first cohabiting relationship during the same year; columns (3) and (4) are further restricted to individuals who did not conceive their first child during the same year as their first stable job, their first temporary job, or their first cohabiting relationship; and all subsamples are restricted to individuals who experienced each event either between age 18 and the minimum of year at age 35 and 2003–2004, or never experienced it. Each row corresponds to a specific variable. Rows 1 and 3 show the employment rate over the life-course for stable jobs and temporary jobs respectively. Row 2 shows the median age at first stable job, and row 4 shows the same figure for temporary jobs. Row 5 corresponds to the proportion of individuals who lived in a cohabiting relationship before the survey, and row 8 to the proportion of individuals who had a child. Rows 6 and 7 show median age at first cohabiting relationship and at first child respectively. Row 9 indicates the proportion of individuals who no longer lived with their parents at the time of the survey, and row 10 indicates the median age at residential independence. Row 11 gives the median school-leaving age. Row 12 shows the proportion of men and women who graduated from higher education and row 13 from high school. Row 14 shows the proportion of individuals who indicated strong religious beliefs. For each variable and each sample, the table reports the mean or the median of the left-hand side variable among the corresponding sample. Standard deviations are in brackets.

This suggests that (1) my estimates of the impacts of a first job on cohabitation are likely downward biased, as the majority of excluded individuals had a job before cohabiting and they transited faster from employment to cohabitation than individuals in my working sample; (2) as the proportion of individuals with a stable or temporary job is more similar among individuals with simultaneous transitions than in my working sample, it is possible that my sample selection biases my findings in favor of finding differential effects of stable and temporary jobs on cohabitation. Note however that only few individuals had both simultaneous transitions and a temporary contract before their first cohabitation (5%), so the bias in favor of differential effects generated by not including these individuals is likely relatively small.[27]

[27] In Section 4, I present results showing that my results are robust to including individuals with simultaneous transitions.

3. Graphical analysis

This section documents sharp changes in individuals' probability of having entered a cohabiting relationship around the year when they entered their first job, and in particular, their first stable job as opposed to their first temporary job. This section also shows some evidence of reverse causality, i.e., employment status seems to impact and be impacted by cohabitation, introducing the importance of addressing this issue by further estimating a multivariate mixed proportional hazard rate model (Section 4).

3.1. Methodology

Using the subsamples described in Table A1 in the Appendix, I construct a panel where each individual i is observed every year g between her year of birth and the year of the survey minus one (data from the year of the survey are not observed from January to December contrary to other years). With this panel, I define three variables, t^{e_x} with

$e_x = \{S, \bar{S}, F\}$, indicating time-distance to event e_x such that $t^{e_x} = 0$ for the year during which event e_x occurs (event e_S being individuals' first stable job, $e_{\bar{S}}$ first temporary job, or e_F first cohabiting relationship). For each event $e_y = \{S, \bar{S}, F\}$, I also define $Y_{i,g}^{e_y}$, which equals one for years after event e_y occurred, or equals zero otherwise (including during the year when event e_y occurred). Using this information, I study how individuals' probability to start a first cohabiting relationship evolves around the timing of their first stable or temporary job, while controlling for age and year fixed-effects. More formally, I estimate the following set of Eqs. separately on subsamples of men and women who have had a first stable job or temporary job between age 18 and the year of the survey minus one:

$$Y_{i,g,t^S}^{F} = \sum_{\substack{j=-5 \\ j\neq 0}}^{10} \alpha_j^{S,F} \mathbb{1}[j = t^S] + \sum_k \beta_k^{S,F} \mathbb{1}[k = age_{i,g}] + \sum_l \gamma_l^{S,F} \mathbb{1}[l = g] + \nu_{i,g,t^S}^{S,F}$$

$$Y_{i,g,t^{\bar{S}}}^{F} = \sum_{\substack{j=-5 \\ j\neq 0}}^{10} \alpha_j^{\bar{S},F} \mathbb{1}[j = t^{\bar{S}}] + \sum_k \beta_k^{\bar{S},F} \mathbb{1}[k = age_{i,g}] + \sum_l \gamma_l^{\bar{S},F} \mathbb{1}[l = g] + \nu_{i,g,t^{\bar{S}}}^{\bar{S},F} \quad (1)$$

Then I conduct a symmetric analysis to investigate how individuals' probability to start a first stable or temporary job evolves around the timing of their cohabiting relationship, by estimating a second set of equations:

$$Y_{i,g,t^F}^{S} = \sum_{\substack{j=-5 \\ j\neq 0}}^{10} \alpha_j^{F,S} \mathbb{1}[j = t^F] + \sum_k \beta_k^{F,S} \mathbb{1}[k = age_{i,g}] + \sum_l \gamma_l^{F,S} \mathbb{1}[l = g] + \nu_{i,g,t^F}^{F,S}$$

$$Y_{i,g,t^F}^{\bar{S}} = \sum_{\substack{j=-5 \\ j\neq 0}}^{10} \alpha_j^{F,\bar{S}} \mathbb{1}[j = t^F] + \sum_k \beta_k^{F,\bar{S}} \mathbb{1}[k = age_{i,g}] + \sum_l \gamma_l^{F,\bar{S}} \mathbb{1}[l = g] + \nu_{i,g,t^F}^{F,\bar{S}} \quad (2)$$

Each regression includes a full set of event-year, age, and year dummies to control nonparametrically for life-cycle and time trends, and the event time-distance $t^{e_x} = 0$ is the reference. Figs. 1a to 1d show the parameters of interest $\alpha_j^{e_x,e_y}$ for each specification estimated separately for men and women. When the dependent event is the first cohabiting relationship, I consider a nonbalanced panel of individuals observed between 5 years before their first stable or temporary job and either 2003–2004 or 10 years later. Similarly, when the dependent events are first stable or temporary jobs, I consider a nonbalanced panel of individuals observed either between 5 years before their first cohabiting relationship or age 18 and either 2003–2004 or 10 years later.[28]

3.2. Results

Figs. 1 a and 1b show the estimated parameters of interest for Eqs. (1) ($\alpha_{j=-5,\ldots,10}^{S,F}$ and $\alpha_{j=-5,\ldots,10}^{\bar{S},F}$) and the corresponding 95% confidence intervals estimated separately for men and women.[29] These figures first show that men's and women's probability to have entered a cohabiting relationship do not vary significantly with respect to the time-distance to first stable or temporary jobs before these events have occurred. Second, Figs. 1a and 1b show that men's and women's probability to have entered a cohabiting relationship increases significantly just after their first stable or temporary job. These figures also show that stable jobs have significantly larger impacts on cohabiting relationships than temporary jobs. For men and women, the probability of having entered a cohabiting relationship is 6.2 and 8.6 percentage points higher respectively once they are permanently employed, compared with an increase of 1.7 and 3.0 percentage points respectively for temporary employment.

Table A1 shows that most individuals entered their first stable or temporary job by age 20 to 21. This means that many individuals are quite young 5 years before their first stable or temporary job, and this may partly play a role in explaining why their likelihood of cohabitation does not vary much before their first job. To address this issue, Figs. A1a and A1b show robustness analyses restricting the timing to -3 years prior to the events, and the sample to individuals who entered their first stable job, temporary job, or first cohabiting relationship at 21 or older. These figures also show that stable jobs seem to have a stronger effect than temporary jobs on cohabitation, but there is a slightly positive trend in cohabitation probability prior to the first stable job, especially for men, suggesting that reverse causality may be an issue in this graphical analysis.

Figs. 1c and 1d show the estimated parameters of interest for Eqs. (2) ($\alpha_{j=-5,\ldots,10}^{F,S}$ and $\alpha_{j=-5,\ldots,10}^{F,\bar{S}}$). Consistent with Figs. 1a and 1b, Figs. 1c and 1d show that men's and women's probability of having started a stable job increases significantly with respect to the time-distance to first cohabiting relationships before this event occurred. Because individuals are more likely to start a cohabiting relationship after their first stable job, the closer they get to their first cohabiting relationship, the more likely they are to be permanently employed. As a result, it is problematic to interpret increases in the probability of a first stable job around the timing of a first cohabiting relationship as reflecting a causal impact of cohabitation on stable employment. These figures suggest that cohabitation may impact positively the probability of entering a first stable job, so that reverse causality issues could be important when studying the effect of employment on cohabitation. Regarding temporary employment, Figs. 1c and 1d do not show much variation in individuals' probability to be in temporary employment around the time of first cohabiting relationship.

Overall, Figs. 1a to 1d suggest that stable employment may have a positive impact on cohabiting relationships, but at this stage these findings may suffer from reverse causality issues and omitted (time-varying) variable bias.

In this graphical analysis, identification relies on the assumption that the timing of e_x is not determined by the outcome, i.e., the event e_y. Under this assumption, conditional on age and year, there should be no discontinuity in $\nu_{i,g,t}^{e_x,e_y}$ around the year when event e_x occurs, and the short-term impact of event e_x on $Y_{i,g,t^{e_x}}^{e_y}$ is obtained by comparing $Y_{i,g,t^{e_x}=0}^{e_y}$ to $Y_{i,g,t^{e_x}=1}^{e_y}$. At this stage, two points are worth noting. Firstly, identification of Eqs. (1) requires that first stable and temporary jobs are not determined by first cohabiting relationships, and identification of Eqs. (2) requires that first cohabiting relationships are not determined by first stable and temporary jobs. This means that if there is any reverse causality issue, then the estimation results from the graphical analysis cannot be interpreted causally. As Figs. 1a to 1d show both an increase in the probability of a first cohabiting relationship after a first stable job, and an increase in the probability of a first stable job after a first cohabiting relationship, it seems hard to interpret causally the point estimates in these figures. However, reverse causality seems to be a smaller issue regarding the relationship between temporary employment and cohabitation, as we do not see any significant increase in the likelihood of a first temporary job after the first cohabitation.

Secondly, identification requires that either unobserved characteristics are constant over time or that they are uncorrelated with the timing of e_x. If there was another event e_{x2} impacting the outcome of interest and whose timing was correlated with e_x it would bias the results. In particular, if the timing of individuals' first stable job was correlated with the timing of their first temporary job, then this event study could incorrectly find a significant impact of first temporary jobs on first cohabiting relationships that would be driven by individuals' first stable job.

[28] $Y_{i,g,t^{e_x}}^{S}$, $Y_{i,g,t^{e_x}}^{\bar{S}}$ and $Y_{i,g,t^{e_x}}^{F}$ are right censored, and $Y_{i,g,t^{e_x}}^{S}$ and $Y_{i,g,t^{e_x}}^{\bar{S}}$ are also left censored.

[29] Standard errors are clustered at the individual level.

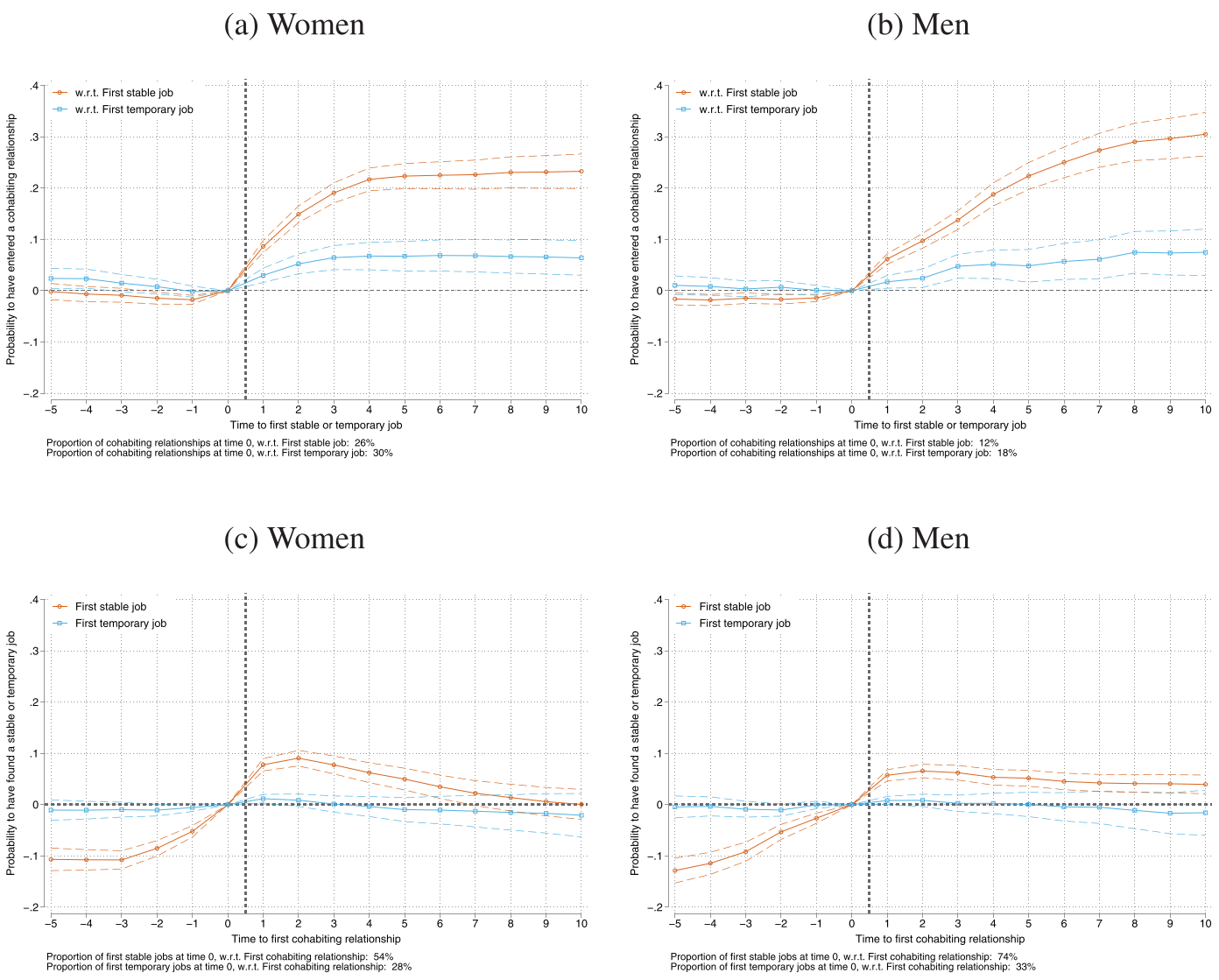

Fig. 1. First stable job, first temporary job and first cohabiting relationship Note: The figures refer to the samples of men and women from the *FE* survey who completed initial schooling before the survey and experienced the event indicated on the horizontal axis between age 18 and 2003 or 2004. Figs. 1a and 1b show the event time coefficients estimated for Eqs. (1), and Figs. 1c and 1d show the event time coefficients estimated for Eqs. (2). The dotted lines represent 95% confidence intervals computed with robust standard errors clustered at the individual level.

The next section builds on Abbring and van den Berg's empirical model to address these two issues. This semi-parametric timing-of-events model enables to account for reverse causality and for the correlation between the timings of individuals' first stable and temporary job by jointly estimating transitions into the three states, and by including potentially correlated unobservable characteristics impacting the timings of the three events of interest.

4. Timing-of-Events analysis

4.1. Methodology

To study the links among stable jobs, temporary jobs, and cohabiting relationships, this section develops a timing-of-events approach (Abbring and van den Berg, 2003) that estimates jointly transitions into the three events and takes into account the potential correlation between the three different timings. Compared to the previous section, this analysis focuses on the samples of men and women who did not experience the events of interest during the same year, but it includes individuals who never experienced the events of interest (i.e., it includes individuals with right-censored information). Furthermore, to avoid left-censoring issues, this analysis focuses on individuals who did not enter a cohabiting relationship before age 18, and the panel starts at age 18 instead of birth.[30] Table 1 describes the samples used in this section, and Table A2 in the Appendix describes individuals excluded from the analysis.[31] The main advantage of using Abbring and van den Berg empirical model compared to the graphical approach in the previous section is to account for the fact that the timing of stable and temporary job may be correlated and to address reverse causality issues.

Abbring and van den Berg empirical model enables to identify causal effects in a dynamic setting where both treatments and outcomes are duration variables. Several papers have used this approach to study

[30] For the ending date, I use the minimum of year at age 35 and year of the survey minus one. As mentioned in Section 2, in the initial sample, for each event more than 95% of individuals who had experienced the event before the survey had experienced it by age 35. Note that as a robustness checks, I will also implement my analyses using 40 years old as alternative age limit.

[31] In addition, Fig. A2 presents descriptive statistics on the number of observations in each employment category over time, namely the number of individuals who have had a first stable job, a first temporary job, or never had a first job, between age 18 and either age 35 or age at the time of the survey.

the dynamics of employment or unemployment, and in particular the effects of economic incentives (such as benefit sanctions) on job finding rates (e.g., see Abbring et al., 2005 or van den Berg et al., 2004). This literature also includes papers studying whether temporary employment is a stepping stone toward regular employment (e.g., Jahn and Rosholm, 2014 or de Graaf-Zijl et al., 2011). There are also several applications of Abbring and van den Berg timing-of-events model in the economic literature on health, in particular to study the consequences of cannabis use for cocaine consumption (van Ours, 2003), for educational attainments (van Ours et al., 2013), for employment (van Ours, 2006), or more recently for suicidal thoughts (van Ours and Williams, 2009). Applications of Abbring and van den Berg's approach related to family formation includes Moschion and van Ours (2019) who study whether parental separation increases the likelihood of becoming homeless; Svarer and Verner (2008) on the effect of children on relationship duration; Bijwaard and Doeselaar (2014) studying the effect of divorce or remarriage on migration; or Gautier et al. (2009) on the consequences of cities for divorce. Abbring and van den Berg duration model shares common feature with Lillard's simultaneous hazard model (Lillard, 1993) which has been used by Lillard and Waite (2000), Aassve et al. (2006), and Niedergesäss (2013) to study the effect of employment relative to unemployment or inactivity on the decision to start a family. However, to my knowledge, this paper is the first to use Abbring and van den Berg multivariate mixed proportional hazard model to estimate the differential effects of stable and temporary jobs on family formation. In this section, I will first specify Abbring and van den Berg's methodology in my setting, then discuss the identification assumptions before presenting the results.

I define $\theta_{i,F}$ as individuals' instantaneous probability of entering a first cohabiting relationship, $\theta_{i,S}$ as individuals' instantaneous probability of starting a first stable job, and $\theta_{i,\bar{S}}$ as individuals' instantaneous probability of starting a first temporary job.[32] The three hazard rates depend on the duration t elapsed since age 18 (the initial date), time-constant observed characteristics ($x_{i,F}$, $x_{i,S}$, $x_{i,\bar{S}}$), time-variant observed characteristics ($x_{i,F,t}$, $x_{i,S,t}$, $x_{i,\bar{S},t}$), time-constant unobserved characteristics ($v_{i,F}$, $v_{i,S}$, $v_{i,\bar{S}}$), and the timings of individuals' first stable job (t_i^S), first temporary job ($t_i^{\bar{S}}$), and first cohabiting relationship (t_i^F). Hazard rates are assumed to have a standard multivariate mixed proportional hazard specification:

$$\begin{aligned}
\theta_{i,F}(t|x_{i,F},v_{i,F},t_i^S,t_i^{\bar{S}}) &= \lambda_F(t)\,\mathrm{e}^{\left(\beta_F x_{i,F}+\gamma_F x_{i,F,t}+\delta_S^F \mathbb{1}(t>t_i^S)+\delta_{\bar{S}}^F \mathbb{1}(t>t_i^{\bar{S}})+v_{i,F}\right)}\\
\theta_{i,S}(t|x_{i,S},v_{i,S},t_i^F,t_i^{\bar{S}}) &= \lambda_S(t)\,\mathrm{e}^{\left(\beta_S x_{i,S}+\gamma_S x_{i,S,t}+\delta_F^S \mathbb{1}(t>t_i^F)+\delta_{\bar{S}}^S \mathbb{1}(t>t_i^{\bar{S}})+v_{i,S}\right)}\\
\theta_{i,\bar{S}}(t|x_{i,\bar{S}},\mu_{i,\bar{S}},t_i^F,t_i^S) &= \lambda_{\bar{S}}(t)\,\mathrm{e}^{\left(\beta_{\bar{S}} x_{i,\bar{S}}+\gamma_{\bar{S}} x_{i,\bar{S},t}+\delta_F^{\bar{S}} \mathbb{1}(t>t_i^F)+\delta_S^{\bar{S}} \mathbb{1}(t>t_i^S)+v_{i,\bar{S}}\right)}
\end{aligned} \tag{3}$$

The main parameters of interest are δ_S^F, $\delta_{\bar{S}}^F$, δ_F^S, and $\delta_F^{\bar{S}}$, which indicate respectively the effect of a first stable job on the instantaneous probability to start cohabiting; the effect of a first temporary job on the instantaneous probability to start cohabiting; the effect of a first cohabiting relationship on the instantaneous probability to start a first stable job; and the effect of a first cohabiting relationship on the instantaneous probability to start a first temporary job.

The analysis includes schooling,[33] residential independence, yearly unemployment rates by age groups and gender, and yearly rental price indexes as time-variant control variables. As time-constant control variables, each specification uses whether individuals graduated from higher education or whether they graduated from high school only (as opposed to lower diploma), a dummy variable indicating strong religious beliefs, and a dummy variable indicating individuals born in 1970 or later. For the baseline hazard rates ($\lambda_F(t)$, $\lambda_S(t)$, and $\lambda_{\bar{S}}(t)$), I use piecewise constant functions. Regarding the joint distribution for the unobserved characteristics, I assume that they follow a discrete distribution with two points of support and unrestricted mass point locations.

Abbring and van den Berg (2003) show that under the no-anticipation assumption, model (3) enables to separate causality from selection. Intuitively, the idea is to estimate whether individuals who find their first stable or temporary jobs later enter their cohabiting relationship as fast afterward as those who had found a first stable or temporary job earlier (and similarly for the impact of first cohabiting relationships on first stable and temporary jobs). As Abbring and van den Berg (2004) underline, whether one transition occurs systematically just after another provides evidence that there is a causal link running from the first transition in time to the second, because selection would imply a strong correlation between both timings but not a quick succession of events.

Abbring and van den Berg's empirical model is identified under the no-anticipation assumption, i.e., under the assumption that individuals either do not know the exact year when their first stable job, temporary job, or cohabiting relationship will happen or do not act upon this information before the events actually occur. Importantly, the no-anticipation assumption does not rule out forward-looking behaviors. The no-anticipation assumption does not imply that individuals cannot have an expectation about the likelihood that future events occur. As long as they do not know in advance when exactly that event will occur, the no-anticipation assumption is not violated. To put it differently, the no-anticipation assumption does not rule out long term planning, it only rules out Ashenfelter's dips, that is individuals changing their behavior before time t because they know for certain that a given event will occur at time t. In this context, looking at the previous figures from the graphical analysis is helpful to assess whether the no-anticipation assumption may be of concern, as Ashenfelter's dips usually exhibit recognizable ups or downs right before an event (see, e.g. Heckman and Smith, 1995). Reassuringly, Figs. 1a and 1b reveal that the probability of having entered a cohabiting relationship evolves smoothly in the years prior to a first stable or temporary job, and similarly Figs. 1c and 1d show no jump in the probability of having found a first stable or temporary job before the first cohabiting relationship.

It is also worth emphasizing that the main goal of my empirical analysis is to highlight that stable jobs have stronger effects than temporary jobs on the likelihood to start a family, with cohabitation as its first step. In this context, violation of the no-anticipation assumption would challenge the validity of my main results if individuals knew the exact date of their first cohabiting relationship more than a year in advance, and intensified (with success) their job search differentially between stable and temporary jobs at least one year before they started their cohabitation. To put it differently, because I drop individuals with simultaneous transitions, the no-anticipation assumption can only be violated if individuals knew in year $t-1$ (or before) that they would start to cohabit in year t, and intensified their job search differentially between stable and temporary jobs in $t-1$ (or before) as a direct consequence of their anticipated cohabitation in year t. Such a phenomenon seems quite unlikely in a context where first-time cohabiting spouses usually rent their first common residence, and rental contracts start very shortly after being signed. Also, we would expect more educated individuals to be better equipped to find a first job shortly after starting to search for one, especially a first stable job, compared to less educated individuals.[34] So if the no-anticipation assumption was violated, we would expect to find a stronger effect of stable jobs on cohabitation among highly educated

[32] This paper focuses on first jobs and first cohabiting relationships to avoid making assumptions regarding the independence among the timings of individuals' several stable jobs, several temporary jobs, and several cohabiting relationships.

[33] For each year starting at age 18, individuals indicated whether they were in education, including both initial schooling and adult education. I use this information to construct binary variables indicating for each year whether individuals are in education or not.

[34] During the period of interest, the unemployment rate was always lower for highly educated individuals, and they were less likely to be employed with a temporary contract.

individuals. By contraposition, if I do not find stronger effects of stable jobs on cohabitation for highly educated individuals, it implies than the no-anticipation assumption is unlikely violated. To anticipate my heterogeneity results, I find that stable jobs do not have stronger effects on the likelihood of a first cohabitation among individuals with high levels of education.

As employment and family calendars are at a yearly level, the duration between an event indicated between year t and year $t+1$ might actually vary between 1 day and up to 2 years. As it would be more difficult to argue that the anticipation assumption holds within a few months before the first cohabiting relationship, first stable job, or first temporary job, I check that the main results hold when I also exclude individuals who experienced two events during consecutive years. With this robustness test I exclude individuals who experienced the events of interest during different years but with only a few months in-between (I exclude individuals who experienced an event during December of year t and January of year $t+1$ for example).

Identification also requires that observed and unobserved characteristics are independent. This is a common assumption in duration models. The main interest of Abbring and van den Berg's methodology compared with standard Cox duration models with frailty is that this model allows for correlation among the timings of the different events. This feature is also helpful compared with the graphical analysis: i.e., Abbring and van den Berg's methodology enables us to estimate the impact of cohabitation on employment even when the timing of cohabitation is not exogenous to employment.

Lastly, identification requires that the unobserved characteristics impacting each transition are constant over time. In other words, the model is identified provided there is no unobserved event that jointly determines the transitions of interest. This is the main reason why I estimate the links between stable jobs, temporary jobs, and cohabiting relationships jointly rather than estimating separately the links between stable jobs and cohabiting relationships on the one hand and the links between temporary jobs and cohabiting relationships on the other. To make this assumption as plausible as possible, I have included several time-varying controls in my analysis. First, I include binary variables indicating for each year whether individual are in education, as we may expect that being enrolled in an education program impacts negatively the likelihood of looking for a first job, as well as the likelihood of moving in with a spouse. For each year, I also include binary variables indicating whether individuals are living independently, as opposed to living with their parents, as living independently may change individuals' job search behavior as well as their likelihood of finding and moving in with a stable partner. Lastly, I also include yearly unemployment rates by year and age groups, and yearly rental price indexes, to capture difficulties in entering the labor or housing markets. In the robustness section, I further check that my results are robust to including additional time-varying control variables.

Time is continuous in model (3) while the *FE* survey provides interval-censored information. Using Monte Carlo simulations, Gaure et al. (2007) show that it is feasible to recover the parameters of model (3) in this context provided that the likelihood function considers the discrete nature of the available data. Therefore, I compute the sample likelihood using the discrete-time version of model (3):

$$\theta^D_{i,F}(t_k|x_{i,F},\nu_{i,F},t_i^S,t_i^{\bar{S}}) = 1-\mathrm{e}^{-\mathrm{e}^{\left(\theta_F x_{i,F}+\gamma_F x_{i,F,t}+\boldsymbol{\delta}_{\mathbf{S}}^{\mathbf{F}}\mathbb{1}(t>t_i^S)+\boldsymbol{\delta}_{\bar{\mathbf{S}}}^{\mathbf{F}}\mathbb{1}(t>t_i^{\bar{S}})+\nu_{i,F}+\phi_k^F\right)}}$$

$$\theta^D_{i,S}(t_k|x_{i,S},\nu_{i,S},t_i^F,t_i^{\bar{S}}) = 1-\mathrm{e}^{-\mathrm{e}^{\left(\theta_S x_{i,S}+\gamma_S x_{i,S,t}+\boldsymbol{\delta}_{\mathbf{F}}^{\mathbf{S}}\mathbb{1}(t>t_i^F)+\delta_{\bar{S}}^{S}\mathbb{1}(t>t_i^{\bar{S}})+\nu_{i,S}+\phi_k^S\right)}}$$

$$\theta^D_{i,\bar{S}}(t_k|x_{i,\bar{S}},\mu_{i,\bar{S}},t_i^F,t_i^S) = 1-\mathrm{e}^{-\mathrm{e}^{\left(\theta_{\bar{S}} x_{i,\bar{S}}+\gamma_{\bar{S}} x_{i,\bar{S},t}+\boldsymbol{\delta}_{\bar{\mathbf{S}}}^{\bar{\mathbf{S}}}\mathbb{1}(t>t_i^F)+\delta_{S}^{\bar{S}}\mathbb{1}(t>t_i^{S})+\nu_{i,\bar{S}}+\phi^{\bar{S}k}\right)}}$$

where $\theta^D_{i,j}$ is the instantaneous probability that event j occurs during the interval $[t_{k-1},t_k)$. Furthermore, $\phi_k^F = \ln\left(\int_{t_{k-1}}^{k}\lambda_F(t)\,\mathrm{d}t\right)$, $\phi_k^S = \ln\left(\int_{t_{k-1}}^{k}\lambda_S(t)\,\mathrm{d}t\right)$, and $\phi^{\bar{S}_k} = \ln\left(\int_{t_{k-1}}^{k}\lambda_{\bar{S}}(t)\,\mathrm{d}t\right)$.

I estimate the parameters of interest jointly using maximum likelihood estimators.

4.2. Results

Table 2 presents my main results. To emphasize the importance of estimating jointly transitions into first stable jobs, first temporary jobs, and first cohabiting relationships, and the importance of accounting for correlated unobserved characteristics impacting the three timings, Table 2 shows the results of three different specifications which progressively add joint estimations and unobserved heterogeneity to improve the causal interpretation of the results.

Table 2 Specification A (columns 1 and 2 for women, and columns 5 and 6 for men) shows the results when I separately estimate the effects of stable jobs on cohabitation, the effects of cohabitation on stable jobs, the effects of cohabitation on temporary jobs, and the effects of temporary jobs on stable jobs. This specification is similar in spirit to the graphical analysis presented in the previous section. Compared to this specification, Specification B (column 3 for women and column 7 for men) shows the results of joint estimations. The main difference between these two specifications relates to the estimated effect of temporary employment on cohabiting relationships. For both men and women, the estimated effects of temporary jobs on cohabitation increases when I use joint estimations. This is likely due to a negative correlation between the timings of stable and temporary jobs, and the larger positive effects of stable jobs on cohabitation. Note however that this specification does not entirely account for reverse causality threats, i.e., for the fact that cohabitation may at the same time impact and be impacted by employment, as it does not take into account that similar unobservable characteristics may co-determine the three transitions. Specification C therefore improves on reverse causality threats and omitted variable biases by introducing potentially correlated unobservable characteristics impacting transitions into the three events. Compared to Specification B, the main changes concern the relationships between cohabitation and stable jobs. While I obtain with Specification B a non significant (men) or negative effect (women) of cohabitation on stable jobs, Specification C shows a positive effect of cohabitation on the instantaneous probability to enter a first stable job for both gender, which is consistent with the figures presented in the previous section. The difference in the estimated effects of cohabitation on stable jobs between Specification B and C is likely due to the presence of unobservable characteristics impacting the timings of first stable jobs and first cohabitations in opposite directions. As a consequence, the estimated effect of first stable jobs on first cohabitations also becomes larger when I introduce potentially correlated unobservable characteristics. This specification also shows a larger effect of temporary jobs on stable employment. This is consistent with the idea that temporary jobs may provide a first step toward stable employment.

To summarize, using the multivariate mixed proportional hazard rate model of Abbring and van den Berg (2003) helps in addressing reverse causality issues together with omitted variable biases. Not accounting for these issues would lead to underestimating the effects of both stable and temporary jobs on cohabiting relationships, to overlook the effect of cohabitation on stable employment, and to underestimate the effects of temporary employment on stable employment.

In terms of magnitude and to come back to my main research question on the differential effects of stable and temporary employment on family formation, Table 2 Specification C shows that a first stable job increases women's and men's instantaneous probability of entering a first cohabiting relationship by 3.5 and 3.9 times respectively (with $3.5 \approx \mathrm{e}^{1.244}$ and $3.9 \approx \mathrm{e}^{1.369}$). By contrast, first temporary jobs have a smaller impact on women's instantaneous probability of entering a first cohabiting relationship (three times lower, with $3.0 \approx \frac{\mathrm{e}^{1.244}}{\mathrm{e}^{0.136}}$) and no significant impact for men.

Table A3 in the Appendix shows the detailed results for model (3). Unsurprisingly, this table shows that individuals are more likely to enter a first stable or temporary job once they are no longer students. Schooling also decreases women's probability of starting a cohabiting

Table 2
First stable job, first temporary job, and first cohabiting relationship.

	Women				Men			
	Spe. A		Spe. B	Spe. C	Spe. A		Spe. B	Spe. C
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hazard rate of a first cohabiting relationship								
First stable job	0.700***		0.718***	1.244***	1.149***		1.160***	1.369***
	(0.051)		(0.052)	(0.074)	(0.066)		(0.066)	(0.081)
First temporary job		0.041	0.122***	0.136***		-0.052	0.066	0.005
		(0.042)	(0.043)	(0.047)		(0.043)	(0.043)	(0.048)
Hazard rate of a first stable job								
First cohab. relationship	-0.483***		-0.454***	0.397***	0.013		0.009	0.301***
	(0.066)		(0.066)	(0.094)	(0.071)		(0.071)	(0.090)
First temporary job		0.222***	0.194***	0.372***		-0.342***	-0.342***	0.259**
		(0.043)	(0.043)	(0.075)		(0.046)	(0.046)	(0.108)
Hazard rate of a first temporary job								
First cohab. relationship	0.095		0.013	0.049	0.117		0.134	0.078
	(0.103)		(0.103)	(0.107)	(0.113)		(0.112)	(0.115)
First stable job		-0.939***	-0.939***	-0.877***		-1.126***	-1.128***	-0.831***
		(0.080)	(0.080)	(0.087)		(0.084)	(0.084)	(0.104)
Joint estimation	No	No	✓	✓	No	No	✓	✓
Unobserved char.	No	No	No	✓	No	No	No	✓
Number of mass points				2				2
Piecewise duration	✓	✓	✓	✓	✓	✓	✓	✓
Control variables	✓	✓	✓	✓	✓	✓	✓	✓
Hazard rate of a first cohabiting relationship								
Sample log-likelihood	-8567.1	-8665.7			-8143.7	-8320.6		
Hazard rate of a first stable job								
Sample log-likelihood	-7597.7	-7611.5			-6547.2	-6519.3		
Hazard rate of a first first temporary job								
Sample log-likelihood	-5687.0	-5618.2			-5491.0	-5401.6		
Joint estimations								
Sample log-likelihood			-21769.0	-21083.3			-20062.7	-19693.2
N	3571	3571	3571	3571	3505	3505	3505	3505

Note: The table refers to the same samples as Table 1 (columns 1 and 2). Column (1) to (4) refer to the subsample of women, and columns (5) to (8) to the subsample of men. Each column corresponds to specific regressions estimating the impact of a first stable or temporary job on the hazard rate of a first cohabiting relationship, and the impact of a first cohabiting relationship on the hazard rate of a first stable or temporary job. In columns (1), (2), (5), and (6), the relationships between first jobs and first cohabiting relationships are estimated separately, while columns (3), (4), (7), and (8) show the results of joint estimations. All regressions include controls for individuals' observed characteristics (namely, schooling status, residential independence, being born after 1970, educational attainments, and religious beliefs), yearly unemployment rates by gender and age groups, yearly rental prices indexes, and duration variables. Columns (4) and (6) also include controls for individuals' unobserved characteristics. Standard errors are in parentheses.
significant at 10%. ** significant at 5%. *** significant at 1%.

relationship but not men's, and nonresidential independence decreases men's probability of cohabitation but not women's.

Additionally, Table A4 shows the estimated distributions for unobserved characteristics impacting first cohabiting relationships, first stable jobs, and first temporary jobs (N_F, N_S, and $N_{\bar{S}}$, respectively). This table shows that the timings of these three events are indeed correlated. More precisely, I find that unobservable characteristics impacting the timings of first stable jobs and first cohabiting relationships are negatively correlated, which explains why simpler estimations strategies without these negatively correlated unobservable characteristics tend to underestimate the effects of stable jobs on cohabiting relationships and the effects of cohabiting relationships on stable employment. Table A4 also shows a negative correlation between unobservable characteristics impacting the timings of first stable and temporary jobs, which is consistent with the fact that accounting for this increases the estimated effect of temporary jobs on cohabitation, but not so much for men as unobservable characteristics impacting their first cohabiting relationship and their first temporary job are in addition positively correlated.

4.3. Robustness tests and heterogeneity analysis

Two main threats may endanger the robustness of my main findings on the differential effects of stable and temporary jobs on cohabiting relationships, namely violations of the no-anticipation assumption and the presence of time-varying factors impacting transitions into stable or temporary employment and first cohabiting relationships.

This subsection presents robustness tests and heterogeneity results which may help in assessing whether violations of the no-anticipation assumption or the presence of unobserved time-varying factors are serious threats for my main findings.

This subsection also present further robustness tests related to measurement errors and to the choice of 35 years old as age limit for my analysis, and additional heterogeneity results which may be relevant to discuss potential mechanisms and policy implications.

Table 3 columns (1) and (2) show the results for subsamples of men and women who did not experience their first stable job, temporary job, or cohabiting relationship during consecutive years. This table confirms that stable employment has a stronger positive impact on cohabitation than temporary employment.[35] In other words, the differential effects of stable and temporary jobs on cohabiting relationships do not seem to be entirely driven by a few individuals obtaining a first stable job

[35] Table 2 Specification C shows that the effects of stable jobs on cohabiting relationships is 3.0 and 3.9 times higher than that of temporary jobs for women and men respectively, and Table 3 columns (1) and (2) show that the effects of stable jobs on cohabiting relationships is 2.0 and 4.6 times higher than that of temporary jobs for women and men respectively.

Table 3
First stable job, first temporary job, and first cohabiting relationship – Robustness to sample selection.

	Excluding transitions in consecutive years		Including simultaneous transitions		Excluding education years		Older age limit	
	Women	Men	Women	Men	Women	Men	Women	Men
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hazard rate of a first cohabiting relationship								
First stable job	0.551***	1.345***	2.052***	1.877***	1.209***	1.562***	1.255***	1.179***
	(0.070)	(0.089)	(0.078)	(0.093)	(0.089)	(0.133)	(0.074)	(0.069)
First temporary job	-0.124**	-0.150**	0.342***	0.111**	0.166***	-0.001	0.118**	0.152**
	(0.062)	(0.065)	(0.047)	(0.046)	(0.054)	(0.050)	(0.047)	(0.077)
Hazard rate of a first stable job								
First cohab. relationship	-0.523***	-0.316***	0.468***	0.418***	-0.233*	0.123	0.417***	0.145*
	(0.117)	(0.104)	(0.076)	(0.079)	(0.133)	(0.097)	(0.095)	(0.082)
First temporary job	0.396***	-0.239*	0.629***	0.691***	1.460***	0.376***	0.411***	0.125
	(0.118)	(0.125)	(0.063)	(0.093)	(0.106)	(0.073)	(0.078)	(0.080)
Hazard rate of a first temporary job								
First cohab. relationship	-0.215	0.009	0.622***	0.338***	0.460***	0.294*	0.049	0.156
	(0.145)	(0.148)	(0.088)	(0.099)	(0.169)	(0.160)	(0.105)	(0.118)
First stable job	-0.630***	-0.828***	-0.761***	-0.631***	-0.140	-0.579***	-0.863***	-0.903***
	(0.129)	(0.132)	(0.073)	(0.091)	(0.139)	(0.144)	(0.084)	(0.096)
Joint estimation	✓	✓	✓	✓	✓	✓	✓	✓
Unobserved char.	✓	✓	✓	✓	✓	✓	✓	✓
Number of mass points	2	2	2	2	2	2	2	2
Piecewise duration	✓	✓	✓	✓	✓	✓	✓	✓
Baseline Control variables	✓	✓	✓	✓	✓	✓	✓	✓
Sample log-likelihood	-13649.9	-14354.3	-26706.8	-23628.1	-12716.8	-13333.5	-21584.4	-20121.3
N	2425	2715	4572	4151	3357	3339	3571	3505

Note: The table reports similar estimation results as Table 2 (columns 4 and 8), with different samples. Columns (1) and (2) use the same specification as Table 2 (columns 4 and 8), but the results are estimated on a smaller sample excluding individuals who had their first stable job, temporary job, or cohabiting relationship during consecutive years. Columns (3) and (4) also use the same specification as Table 2 (columns 4 and 8), but the results are estimated on a larger sample including individuals who had their first stable job, temporary job, or cohabiting relationship during the same year. Columns (5) and (6) focus on the same initial working sample as Table 2 (columns 4 and 8), restricted to years when individuals are not in education. Lastly, columns (7) and (8) extend the analysis to include individuals between ages 18 to 40, rather than 18 to 35. All regressions include controls for individuals' observed characteristics (namely, schooling status, residential independence, being born after 1970, educational attainments, and religious beliefs), yearly unemployment rates by gender and age groups, yearly rental prices indexes, duration variables, and individuals' unobserved characteristics.
significant at 10%. ** significant at 5%. *** significant at 1%.

(rather than a first temporary job) shortly before moving in with their spouse, potentially in anticipation of their future cohabiting relationship. This gives credit to the idea that violations of the non-anticipation assumption is not a major threat for the validity of my main findings.

There are however a few differences in the point estimates obtained with this sample selection compared to Table 2 Specification C. As the specification in Table 3 columns (1) and (2) excludes fast movers, i.e., individuals who start cohabiting relatively shortly after their first job, and individuals who start their first job relatively shortly after cohabiting, we expect a decrease in the estimated effects of first jobs on cohabiting relationships, and in the estimated effects of first cohabitations on first jobs. This is what I obtain: the estimated effect of a first stable job on the instantaneous probability to enter a first cohabiting relationship is lower with this sample restriction, especially for women; temporary jobs now appear to have a negative impact on cohabitation for both men and women; and cohabitation now seems to decrease the likelihood of a first stable job for both gender. This suggests that excluding individuals with simultaneous transitions in the main analysis also likely leads to underestimating the effects of first jobs on first cohabitations and conversely, and this underestimation may be more pronounced for women.

To show that excluding individuals with simultaneous transitions likely contributes to underestimating the effects of first jobs on first cohabitations and conversely, Table 3 columns (3) and (4) replicate my main analysis on the full sample, with individuals who entered their first job and first cohabitation in the same year. To perform this analysis, I leverage information about employment status before individuals' first cohabitation, and information on the type of contracts that individuals had during their first job. I consider that individuals obtained their first job one year before if they report being employed before their first cohabitation, or I consider that individuals entered their first cohabitation one year before if they report not being employed before their first cohabitation. As expected, because this analysis includes fast movers, I obtain larger effects of first jobs on first cohabitations and conversely with this sample, and first stable jobs still have larger effects on cohabitations compared to first temporary jobs.[36]

To further discuss the plausibility of the non-anticipation assumption in my context, Table 5 columns (1) to (3) show heterogeneity results by educational attainments. Highly educated individual are likely to find a first job sooner after they start searching for one compared to individuals with lower levels of education, as the unemployment rate tends to decrease with educational attainments. This is especially true for stable jobs: in 2016 in France, 65.6% of individuals with a higher education degree and who had finished their schooling one to four years earlier had a permanent job position, while this proportion was 52.3% for high school graduates, and 39.5% for individuals with lower levels of education (see INSEE, 2018). In this context, if my results were driven by individuals increasing their search for stable jobs in anticipation of their future cohabitation, we would expect to find stronger effects of stable jobs on cohabiting relationships for highly educated individuals, as their job search would likely be more successful. However, Table 5 columns (1) to (3) show opposite results: the lower the educational attainments,

[36] Table 3 columns (5) to (8) show additional robustness analyses to the choice of sample restrictions. Columns (5) and (6) replicate my main analysis when excluding years during which individuals report being in education. Columns (7) and (8) use age 40 rather than age 35 as age limit. These columns also show larger effects of stable jobs compared to temporary jobs on cohabiting relationships.

the stronger the effect of the first stable job on the instantaneous probability to enter a first cohabiting relationship. By contraposition, these results highlight that anticipations of future cohabiting relationships are unlikely to explain my findings on the effects of employment on cohabitation.

Another threat to identification would be the existence of time varying unobservable characteristics jointly impacting individuals' transitions into first jobs and first cohabiting relationships. Such confounding factors may be the availability of stable jobs, temporary jobs, and affordable housing in proximity of individuals' place of residence. To check that my results are not driven by such omitted time-varying variables, Table 4 columns (1) and (2) show the results when controlling for the proportion of individuals in stable job positions, temporary job positions, and for the proportion of individuals living independently by gender, age groups, and geographical units (departments of France).[37] Reassuringly, I also obtain that stable jobs have stronger effects than temporary jobs on the likelihood of entering a first cohabiting relationship, suggesting that my main findings is not driven by differences in the availability of stable jobs, temporary jobs, and affordable housing over time and geographical areas. Note that there is some measurement errors regarding individuals' department of residence, which is the reason why I do not use this specification in my main analysis. I know in which departments individuals were born, in which department individuals were surveyed, when individuals changed departments, and how many times in total they moved to a different department. In this context, I have accurate information on individuals' department of residence for individuals who moved to a different department at most once (72% of the working sample). For individuals who changed departments 2 times or more, I do not know in which department they resided between their first and last move. For these individuals, I assume that they moved in the department where they were surveyed the first time they moved to a new department.

While getting a job is an individual event, cohabitation involves two individuals. Omitting spouses' employment status may therefore bias the estimation results if spouses' employment outcomes are correlated. To check whether this omission of partners' employment is a threat for my main findings, Table 4 columns (4) and (6) show the results when controlling for whether spouses are permanently or temporarily employed. To implement this robustness check, I have to rely on a different sample selection compared to the main analysis. The *FE* survey was conducted at the household level, and within each household maximum two (randomly chosen) individuals were surveyed among eligible individuals (i.e., household members between 20 and 49 years old). In this context, I have information on both spouses' employment calendars for individuals living with their first spouse at the time of the survey (62% of the working sample), in households where both spouses were surveyed (83% of individuals living with their first spouse). To check whether this sample selection impacts the estimation results, I first estimate my main econometric model on this sample of women and men (Table 4 columns 3 and 5), and I obtain similar results. Table 4 columns (4) and (6) use the same samples, and further include in the analysis spouses' first stable and temporary jobs. I obtain that spouses' first stable and temporary jobs also matter for entry into cohabitation, but including these variables does not change my main findings on the differential effects of individuals' own stable and temporary jobs on cohabiting relationships. These columns also show that spouses' stable jobs have stronger effects on cohabitation compared to spouses' temporary jobs, suggesting an additional channel through which job insecurity may deteriorate family formation. Lastly, these columns show that the effects of first jobs (individuals' and spouses' first jobs) on cohabitation are quite similar between men and women.[38]

As highlighted in Section 2, I do not have complete retrospective information on job contracts. Instead, for each year I know whether individuals had a job that lasted less than 6 months, and whether they had a job that lasted more than 6 months, and I use this information to define stable and temporary jobs. In this context, measurement errors can arise either from temporary contracts lasting more than 6 months, or from open-ended contracts lasting less than 6 months. To check that my main findings are robust to these measurement errors, Table 4 columns (11) and (12) reproduce my main analysis with an alternative definition of temporary and stable jobs based on observed job duration and on the maximum legal duration of temporary contracts over time.[39] With this alternative definition, I also obtain that stable jobs have stronger implications for cohabitation compared to temporary jobs, especially for men. Note however that this alternative definition of temporary and stable jobs also includes measurement errors, as I do not know the precise starting and ending dates of each job. For example, with my data I cannot distinguish individuals with temporary jobs of one year for three years in a row, from individuals with a permanent job that lasted for three years. With this alternative definition of temprary or stable jobs, both situations would be categorized as stable jobs, which could bias downward my estimated effects of stable jobs on cohabiting relationships.

There are many reasons why a first stable job may have different implications than a first temporary job for entering a first cohabiting relationship.[40] A first set of explanations is linked to the housing market and its requirements. In France, it is very difficult to rent a house or an apartment without a permanent work contract, especially in the largest cities. The French legislation surrounding the rental market is extremely protective of the tenants. For example, since 1956 landlords are not allowed to evict their tenants between December 1st and March 15th, even if tenants do not pay their rent.[41] In this context, private landlords, estate agents, and insurance companies commonly screen applicants based on their work contracts and reject tenants with temporary contracts, expect if a family member acts a guarantor for the rent. This may explain why most young adults (25–29 year old) living with their parents have a temporary work contract (INSEE, 2018), and why getting a first stable job would positively impact the likelihood of starting a first cohabiting relationship. A second set of explanation is linked to the marriage market. Getting a first job may change the pool of individuals with whom one interacts, and these new interactions may increase the likelihood that one finds a spouse, especially if these interactions change more permanently (friction hypothesis). Getting a first job may also change individuals' attractiveness by signaling a higher earning potential (attractiveness hypothesis). As individuals employed with temporary contract will in most cases have to look for a new job once their contract is over, getting a stable job likely sends a stronger signal for future earnings trajectories. Lastly, getting a first stable job likely changes

[37] I do not control for yearly unemployment rates by gender and age groups, nor by yearly rental price indexes in this specification, as the unemployment rate by gender and age groups is highly correlated with the proportion of stable jobs by gender and age groups (-0.83), and the rental price index is highly correlated with the proportion of individuals living independently (0.99).

[38] Table 4 columns (7) to (10) show additional robustness analyses to the choice of control variables. Columns (7) and (8) replicate my main analysis while controlling for birth cohort fixed-effects, and columns (9) and (10) do not use residential independence as control variable. These columns show very similar estimated effects compared to the main specification.

[39] Until 1978, temporary contracts could only last for a maximum duration of 3 months. From 1979 to 1981, the maximum duration of temporary contracts was set to one year. From 1982 to 1985, temporary contracts were limited to 6 months. From 1986 to 1989, the total maximum duration of temporary contracts was extended to 24 months. Lastly, during 1990–2017 the maximum duration of standard temporary contracts was shortened to 18 months.

[40] Note that for similar individual characteristics, Bonnet et al. (2019) show that open-ended and temporary contracts usually offer similar wages. So differences in the earnings associated with stable and temporary jobs are unlikely to explain the differential effects of stable and temporary jobs on cohabitation.

[41] In 1990, this period was extended from November 1st to March 15th.

Table 4
First stable job, first temporary job, and first cohabiting relationship – Robustness to the choice of variables.

	Unemployment and rental prices over time & space		Spouses' first jobs				Birth-cohort fixed-effects		No controls for residential independence		Alternative definitions of stable and temporary jobs	
	Women	Men	Women		Men		Women	Men	Women	Men	Women	Men
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Hazard rate of a first cohabiting relationship												
First stable job	1.253***	1.215***	1.035***	1.029***	1.311***	1.251***	1.253***	1.388***	1.244***	1.412***	0.801***	1.136***
	(0.076)	(0.070)	(0.105)	(0.100)	(0.091)	(0.101)	(0.074)	(0.082)	(0.074)	(0.081)	(0.055)	(0.072)
First temporary job	0.118**	0.329***	0.177***	0.181***	0.058	0.086	0.138***	-0.010	0.138***	0.015	0.267***	0.049
	(0.049)	(0.098)	(0.061)	(0.060)	(0.060)	(0.065)	(0.048)	(0.049)	(0.047)	(0.048)	(0.043)	(0.068)
Spouses' first stable job				0.736***		0.766***						
				(0.067)		(0.052)						
Spouses' first temp. job				0.251***		0.191***						
				(0.056)		(0.055)						
Hazard rate of a first stable job												
First cohab. relationship	0.380***	0.126	0.625***	0.639***	-0.024	-0.106	0.412***	0.328***	0.344***	0.392***	-0.180**	0.154*
	(0.107)	(0.090)	(0.139)	(0.135)	(0.116)	(0.099)	(0.097)	(0.090)	(0.078)	(0.082)	(0.081)	(0.085)
First temporary job	0.667***	0.225**	0.297***	0.289***	0.571***	3.754***	0.416***	0.369***	0.366***	0.317***	1.852***	-0.193***
	(0.117)	(0.097)	(0.098)	(0.108)	(0.114)	(0.630)	(0.080)	(0.121)	(0.074)	(0.112)	(0.119)	(0.066)
Spouses' first temp. job				-0.128		0.153**						
				(0.086)		(0.075)						
Hazard rate of a first temporary job												
First cohab. relationship	-0.068	0.431***	0.236	0.345**	0.125	0.148	0.054	0.095	-0.071	0.013	0.283**	0.135
	(0.116)	(0.151)	(0.159)	(0.155)	(0.175)	(0.173)	(0.106)	(0.116)	(0.086)	(0.099)	(0.117)	(0.118)
First stable job	-0.817***	-0.955***	-0.994***	-0.845***	-0.759***	3.293***	-0.856***	-0.761***	-0.893***	-0.813***	-0.462***	-1.691***
	(0.113)	(0.113)	(0.129)	(0.126)	(0.143)	(1.067)	(0.089)	(0.110)	(0.087)	(0.105)	(0.135)	(0.095)
Spouses' first stable job				-0.405***		-0.196						
				(0.090)		(0.128)						
Joint estimation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Unobserved char.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Number of mass points	2	2	2	2	2	2	2	2	2	2	2	2
Piecewise duration	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Baseline Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sample log-likelihood	-20243.6	-18739.5	-10400.0	-10319.0	-11062.9	-10870.8	-20993.9	-19606.1	-21085.8	-19711.7	-21972.3	-20167.3
N	3571	3505	1741	1741	1918	1918	3571	3505	3571	3505	3626	3519

Note: The table reports similar estimation results as Table 2 (columns 4 and 8), with different variables. Columns (1), (2) and (7) to (10) focus on the same samples and use the same specification as Table 2 (columns 4 and 8), with different control variables. Columns (1) and (2) include proxies for unemployment rates and rental prices over time and space, namely the proportion of stable jobs, the proportion of temporary jobs, and the proportion of individuals living independently by year, gender, age groups, and geographical units (departments of France). Columns (7) and (8) include birth-cohort fixed-effects. Columns (9) and (10) do not control for residential independence. Columns (3) to (6) focus on the sample of individuals who were still in their first cohabiting relationship at the time of the survey, and whose spouse participated in the *FE* survey. Columns (3) and (5) report estimation results obtained with the same specification as in Table 2 (columns 4 and 8), while columns (4) and (6) additionally control for spouses' first stable or temporary jobs. Lastly, columns (11) and (12) use the same samples as Table 2 (columns 4 and 8), with an alternative definition of stable and temporary jobs based on the maximum legal duration of temporary contracts over time. All regressions include controls for individuals' observed characteristics (namely, schooling status, residential independence (expect for columns 9 and 10), being born after 1970, educational attainments, and religious beliefs), yearly unemployment rates by gender and age groups (expect for columns 1 and 2), yearly rental prices indexes (expect for columns 1 and 2), duration variables, and individuals' unobserved characteristics.
significant at 10%. ** significant at 5%. *** significant at 1%.

Table 5
First stable job, first temporary job, and first cohabiting relationship – Heterogeneity analysis.

	Education			Living condition before 1st job		Birth-cohorts	
	High	Medium	Low	Residential inde.	Non residential inde.	< 1970	≥ 1970
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hazard rate of a first cohabiting relationship							
First stable job	0.877***	1.176***	1.231***	0.555***	2.038***	1.046***	1.151***
	(0.089)	(0.107)	(0.097)	(0.110)	(0.093)	(0.062)	(0.085)
First temporary job	0.366	0.177	0.085*	-0.010	0.114***	0.045	0.238***
	(0.277)	(0.122)	(0.048)	(0.147)	(0.039)	(0.040)	(0.054)
Hazard rate of a first stable job							
First cohab. relationship	0.241***	-0.143	-0.135	0.240***	0.216**	-0.150**	0.403***
	(0.078)	(0.120)	(0.104)	(0.086)	(0.104)	(0.073)	(0.099)
First temporary job	0.079	0.002	2.085***	0.233**	0.399***	2.366***	0.170**
	(0.066)	(0.074)	(0.116)	(0.117)	(0.080)	(0.113)	(0.072)
Hazard rate of a first temporary job							
First cohab. relationship	0.228	-0.162	0.186	0.275*	0.117	0.154	0.060
	(0.266)	(0.189)	(0.134)	(0.157)	(0.118)	(0.118)	(0.126)
First stable job	-1.274***	-1.243***	0.961***	-1.001***	-1.045***	0.848***	-0.875***
	(0.140)	(0.140)	(0.222)	(0.176)	(0.084)	(0.220)	(0.115)
Joint estimation	✓	✓	✓	✓	✓	✓	✓
Unobserved char.	✓	✓	✓	✓	✓	✓	✓
Number of mass points	2	2	2	2	2	2	2
Piecewise duration	✓	✓	✓	✓	✓	✓	✓
Control variables	✓	✓	✓	✓	✓	✓	✓
Sample log-likelihood	-12796.4	-6841.4	-20770.0	-10963.2	-29003.8	-25590.6	-15275.3
N	2093	1174	3809	1831	5245	4375	2701

Note: The table refers to the same samples as Table 1 (columns 1 and 2). Each column focuses on a specific subsample and show the results of specific regressions where the impact of a first stable job and temporary job on the hazard rate of a first cohabiting relationship and the impact of a first cohabiting relationship on the hazard rate of a first stable job and temporary job are estimated jointly (same specification as Table 2, columns 4 and 8). Columns (1) to (3) distinguish individuals based on their educational attainments. Column (1) focuses on individuals who graduated from higher education, column (2) focuses on high school graduates, and column (3) focuses on individuals with lower educational attainments. Columns (4) and (5) distinguish individuals depending on whether they were living independently (column 4) or with their parents (column 5) before their first job. Lastly, Columns (6) and (7) distinguish older and younger cohorts (columns 6 and 7, respectively). All regressions include controls for individuals' observed characteristics (gender, schooling status, residential independence, and religious beliefs), yearly unemployment rates by gender and age groups, yearly rental prices indexes, duration variables, and individuals' unobserved characteristics. Columns (1) to (5) also control for being born in or after 1970, and columns (4) to (7) include controls for educational attainments.
significant at 10%. ** significant at 5%. *** significant at 1%.

the predictability of one's future place of residence, which may change the expected value of having a stable partner (predictability hypothesis).

To test whether the differential effects of stable and temporary jobs on cohabiting relationships may be linked with the housing market and/or the marriage market, it is likely relevant to conduct a heterogeneity analysis based on individuals' living conditions (independently or with their parent) prior to their first job. If my effects were entirely driven by a differential access to the housing market depending on individuals' work contract, I would expect that a first stable job does not increase the likelihood of entering a first cohabiting relationship for individuals who already managed to live independently. By contrast, if my effects were entirely driven by the marriage market, we would expect to find similar effects of stable jobs on cohabiting relationships independently of individuals' living conditions. Lastly, if both the housing and the marriage markets played a role for my finding, we would expect to find that stable jobs have larger effects than temporary jobs on cohabitation both for individuals living independently and with their parents, and to find stronger effects of a first stable job for individuals living with their parents prior to their first job. This is what Table 5 columns (4) and (5) show, suggesting that both the housing and the marriage markets may play a role in explaining why stable jobs have stronger implications than temporary jobs for cohabitation.

To assess whether increases in the difficulties faced by young adults to enter stable employment partly explain observed delays in family formation, it is important to understand whether the effects of stable and temporary jobs on cohabitation have changed over time. If temporary jobs have similar implications for cohabiting relationships as stable jobs for younger cohorts, then increases in the share of temporary contracts over time unlikely explain delays in age at first cohabiting relationships. To provide evidence on this question, Table 5 columns (6) and (7) show the relationship between first jobs and first cohabiting relationships separately on cohorts born before or after 1970. These columns show that temporary jobs have stronger effects on cohabitation among younger cohorts; however, stable jobs still have larger effects suggesting that increases in job insecurity may partly explain observed delays in cohabitation.[42]

4.4. Stable jobs, temporary jobs, cohabiting relationships, and fertility

My timing-of-events results suggest that stable employment has important implications for cohabiting relationships. As cohabiting relationships are often a first step before childbirth, stable employment is likely to also have implications for fertility decisions. However, it is an open question as to whether employment impacts fertility only through cohabiting relationships or also directly. This subsection develops a timing-of-events analysis to investigate the links among stable jobs, temporary jobs, cohabiting relationships, and childbirths.

[42] Coherently, Table 4 columns (7) and (8) show that the results are very similar when I add birth-cohort fixed-effects as control variables.

Table 6
First stable job, first temporary job, first cohabiting relationship, and first child.

	Women					Men				
	Spe. A			Spe. B	Spe. C	Spe. A			Spe. B	Spe. C
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Hazard rate of a first cohabiting relationship										
First stable job	0.845***			0.876***	0.961***	1.182***			1.204***	1.202***
	(0.058)			(0.058)	(0.062)	(0.071)			(0.071)	(0.074)
First temporary job		0.019		0.111**	0.228***		-0.035		0.092**	0.136**
		(0.046)		(0.046)	(0.059)		(0.045)		(0.046)	(0.060)
First child			0.176*	0.322***	1.656***			1.215***	1.237***	2.642***
			(0.094)	(0.094)	(0.182)			(0.106)	(0.107)	(0.226)
Hazard rate of a first child										
First stable job	0.142*			0.226***	0.716***	1.008***			0.785***	0.733***
	(0.073)			(0.072)	(0.101)	(0.127)			(0.129)	(0.134)
First temporary job		-0.128***		-0.072	0.013		-0.168***		-0.053	-0.050
		(0.050)		(0.050)	(0.053)		(0.052)		(0.052)	(0.069)
First cohab. relationship			2.676***	2.676***	3.103***			3.205***	3.156***	3.291***
			(0.093)	(0.093)	(0.128)			(0.116)	(0.115)	(0.124)
Hazard rate of a first stable job										
First cohab. relationship	-0.374***			-0.084	0.027	-0.006			0.108	0.161*
	(0.070)			(0.069)	(0.078)	(0.076)			(0.078)	(0.094)
First child		-1.490***		-1.449***	-1.023***		-0.553***		-0.594***	-0.369**
		(0.092)		(0.094)	(0.101)		(0.141)		(0.147)	(0.182)
First temporary job			0.225***	0.100**	2.270***			-0.359***	-0.356***	0.347**
			(0.046)	(0.047)	(0.123)			(0.048)	(0.048)	(0.148)
Hazard rate of a first temporary job										
First cohab. relationship	-0.069			-0.069	0.031	0.048			0.088	0.082
	(0.113)			(0.116)	(0.130)	(0.119)			(0.123)	(0.129)
First child		-0.096		-0.220*	0.022		-0.034		-0.058	-0.011
		(0.116)		(0.120)	(0.137)		(0.143)		(0.150)	(0.154)
First stable job			-1.037***	-1.060***	0.468**			-1.142***	-1.144***	-0.790***
			(0.089)	(0.090)	(0.212)			(0.089)	(0.089)	(0.123)
Joint estimation	No	No	No	✓	✓	No	No	No	✓	✓
Unobserved char.	No	No	No	No	✓	No	No	No	No	✓
Number of mass points					2					2
Piecewise duration	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hazard rate of a first cohabiting relationship										
Sample log-likelihood	-7196.8	-7312.1	-7310.5			-7201.2	-7363.6	-7316.2		
Hazard rate of a first stable child										
Sample log-likelihood	-6327.2	-6325.8	-5670.1			-5770.9	-5805.2	-5096.5		
Hazard rate of a first stable job										
Sample log-likelihood	-6376.6	-6227.2	-6379.3			-5924.4	-5915.7	-5896.4		
Hazard rate of a first first temporary job										
Sample log-likelihood	-4773.4	-4773.3	-4706.1			-4960.1	-4960.1	-4876.3		
Joint estimations										
Sample log-likelihood				-23779.8	-23162.2				-22986.9	-22610.3
N	3033	3033	3033	3033	3033	3158	3158	3158	3158	3158

Note: The table refers to the same samples as Table 1 (columns 3 and 4). Column (1) to (5) refer to the subsample of women, and columns (6) to (10) to the subsample of men. Each column corresponds to specific regressions estimating the impact of a first stable or temporary job on the hazard rate of a first cohabiting relationship or fertility event, and the impact of a first cohabiting relationship or fertility event on the hazard rate of a first stable or temporary job. In columns (1), (2), (3), (6), (7) and (8), the relationships between first jobs and first cohabiting relationships or fertility events are estimated separately, while columns (4), (5), (9), and (10) show the results of joint estimations. All regressions include controls for individuals' observed characteristics (namely, schooling status, residential independence, being born after 1970, educational attainments, and religious beliefs), yearly unemployment rates by gender and age groups, yearly rental prices indexes, and duration variables. Columns (5) and (10) also include controls for individuals' unobserved characteristics. Standard errors are in parentheses.
significant at 10%. ** significant at 5%. *** significant at 1%.

To study the links among stable jobs, temporary jobs, cohabiting relationships, and childbirths, I estimate jointly a discrete version of the following model on the samples described in Table 1:

$$
\begin{aligned}
\theta_{i,F}(t|x_{i,F},\nu_{i,F},t_i^S,t_i^{\bar{S}},t_C) &= \lambda_F(t)\,\mathrm{e}^{\left(\beta_F x_{i,F}+\gamma_F x_{i,F,t}+\delta_S^F \mathbb{1}(t>t_i^S)+\delta_{\bar{S}}^F \mathbb{1}(t>t_i^{\bar{S}})+\delta_C^F \mathbb{1}(t>t_{i,C})+\nu_{i,F}\right)}\\
\theta_{i,C}(t|x_{i,C},\nu_{i,C},t_i^S,t_i^{\bar{S}},t_F) &= \lambda_C(t)\,\mathrm{e}^{\left(\beta_C x_{i,C}+\gamma_C x_{i,C,t}+\delta_S^C \mathbb{1}(t>t_i^S)+\delta_{\bar{S}}^C \mathbb{1}(t>t_i^{\bar{S}})+\delta_F^C \mathbb{1}(t>t_i^F)+\nu_{i,C}\right)}\\
\theta_{i,S}(t|x_{i,S},\nu_{i,S},t_i^F,t_i^{\bar{S}},t_C) &= \lambda_S(t)\,\mathrm{e}^{\left(\beta_S x_{i,S}+\gamma_S x_{i,S,t}+\delta_F^S \mathbb{1}(t>t_i^F)+\delta_{\bar{S}}^S \mathbb{1}(t>t_i^{\bar{S}})+\delta_C^S \mathbb{1}(t>t_{i,C})+\nu_{i,S}\right)}\\
\theta_{i,\bar{S}}(t|x_{i,\bar{S}},\mu_{i,\bar{S}},t_i^F,t_i^S,t_C) &= \lambda_{\bar{S}}(t)\,\mathrm{e}^{\left(\beta_{\bar{S}} x_{i,\bar{S}}+\gamma_{\bar{S}} x_{i,\bar{S},t}+\delta_F^{\bar{S}} \mathbb{1}(t>t_i^F)+\delta_S^{\bar{S}} \mathbb{1}(t>t_i^S)+\delta_C^{\bar{S}} \mathbb{1}(t>t_{i,C})+\nu_{i,\bar{S}}\right)}
\end{aligned}
\tag{4}
$$

where t_C is a proxy for the year of conception of individuals' first child.[43] Here, I use year of conception instead of year of birth for the first child because it is likely that individuals know rather precisely when they will become parents more than a few months in advance and act upon this information.

Table 6 Specification C shows the estimated parameters of interest for model (4), estimated separately for men and women.

[43] $t_C = t_B - 1$ for children born between January 1st and September 30th and $t_C = t_B$ for children born between October 1st and December 31st.

This table shows that first stable jobs have an indirect impact on men's and women's probability of having a first child because they impact cohabiting relationships positively and cohabiting relationships impact fertility decisions positively. This table also shows that stable jobs have a direct positive impact on men's and women's instantaneous probability of having a first child (they have a multiplicative impact of 2.0 for women and 2.1 for men). By contrast, first temporary jobs have a smaller indirect impact on fertility decisions (about 2 to 3 times smaller) and they do not have any direct positive impact.

Noticeably, Table 6 highlights a significant difference between genders regarding the impact of childbirth on employment. First children have a stronger negative impact on women's stable employment chances than on men's. This is consistent with the literature on gender and child penalty (see, e.g., Angelov et al., 2016; Kleven et al., 2018; Lundborg et al., 2017).

Similarly as with Table 2, not accounting for reverse causality and selection issues would lead to underestimating the effects of cohabitation on entry into a first stable job, and the effect of stable employment on cohabitation.[44]

5. Conclusion

In recent decades, youth unemployment and the share of temporary contracts among young workers have increased substantially throughout OECD countries. This paper aims at understanding the consequences of such increases in job insecurity for family formation by estimating if employment impacts entry into cohabiting relationships and fertility decisions, and if stable and temporary employment have similar implications.

Relying on a timing-of-events analysis, I provide evidence that the effect of employment on cohabiting relationships depends on whether the job position under consideration is stable or not. First, stable jobs increase men's and women's instantaneous probability of entering a first cohabiting relationship by 3.9 and 3.5 times, respectively. By comparison, the impact of temporary jobs is much smaller (they have a multiplicative impact of 1.1 for women and no significant impact for men). Second, this paper shows that stable jobs impact fertility decisions indirectly through cohabiting relationships but also have a direct impact. The direct multiplicative impact of stable jobs on men's and women's instantaneous probability to have a first child is 2.1 and 2.0, respectively. By contrast, temporary jobs have smaller indirect impacts and no direct impact on fertility decisions. Overall, the results reported in this paper suggest that the increasing difficulty of entering the labor market with a permanent contract has likely played an important role in explaining the delays in family formation observed in recent decades.

As temporary jobs do not have similar implications as stable jobs for cohabiting relationships and fertility decisions, this paper suggests that policies favoring temporary jobs at the expense of stable jobs may incidentally delay individuals' cohabiting relationships and fertility decisions. Such delays in family formation may further impact overall fertility, especially women's fertility as the results in Prifti and Vuri (2013) and Lopes (2018) suggest, and given that men's and women's probability to have children decreases with age (especially women's).

A limitation of the current study concerns the mechanisms behind the finding that stable jobs have larger effects on cohabitation compared to temporary jobs: more research would be needed to properly assess why stable employment impacts family formation differently than temporary employment. In particular, it would be of interest to investigate in more details the potential role of the housing and marriage markets for my results. In addition, the results presented in the paper differentiate stable and temporary jobs depending their duration (more or less than six months) rather than through the type of work contract. It would be of interest to investigate if temporary work contracts have stronger effects on family formation depending on their duration.

[44] Tables A5 and A6 in the Appendix provide the detailed results for model (4). I also conducted similar robustness checks and heterogeneity analyses as in Section 4.3. These robustness checks and heterogeneity analyses are available upon request, and they confirm that stable jobs have stronger implications than temporary jobs, both for cohabiting relationships and fertility.

Supplementary materials

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.labeco.2021.102077.

References

Aaronson, D., Lange, F., Mazumder, B., 2014. Fertility transitions along the extensive and intensive margins. American Economic Review 104 (11), 3701–3724.

Aassve, A., Burgess, S., Propper, C., Dickson, M., 2006. Employment, family union and childbearing decisions in great britain. Journal of the Royal Statistical Society Series A 169 (4), 781–804.

Abbring, J.H., van den Berg, G.J., 2003. The nonparametric identification of treatment effects in duration models. Econometrica 71 (5), 1491–1517.

Abbring, J.H., van den Berg, G.J., 2004. Analyzing the effect of dynamically assigned treatments using duration models, binary treatment models, and panel data models. Empir Econ 29 (1), 5–20.

Abbring, J.H., Berg, G.J., Ours, J.C., 2005. The effect of unemployment insurance sanctions on the transition rate from unemployment to employment. Economic Journal 115 (505), 602–630.

Adsera, A., 2004. Changing fertility rates in developed countries. the impact of labor market institutions. J Popul Econ 17 (1), 17–43.

Adsera, A., 2005. Vanishing children: from high unemployment to low fertility in developed countries. American Economic Review 95 (2), 189–193.

Adsera, A., 2011. Where are the babies? labor market conditions and fertility in europe. European Journal of Population / Revue européenne de Démographie 27 (1), 1–32.

Angelov, N., Johansson, P., Lindahl, E., 2016. Parenthood and the gender gap in pay. J Labor Econ 34 (3), 545–579.

Auer, W., Danzer, N., 2016. Fixed-term employment and fertility: evidence from german micro data. CESifo Econ Stud 62 (4), 595–623.

van den Berg, G.J., van der Klaauw, B., van Ours, J.C., 2004. Punitive sanctions and the transition rate from welfare to work. J Labor Econ 22 (1), 211–241.

Bijwaard, G., Doeselaar, S., 2014. The impact of changes in the marital status on return migration of family migrants. J Popul Econ 27 (4), 961–997.

Black, S.E., Devereux, P.J., Salvanes, K.G., 2008. Staying in the classroom and out of the maternity ward? the effect of compulsory schooling laws on teenage births. Economic Journal 118 (530), 1025–1054.

Blau, F.D., Winkler, A.E., 2011. Women and Men in the Economy. International Handbook on Teaching and Learning Economics. Edward Elgar Publishing. chapter 66

Boeri, T., 2011. Institutional reforms and dualism in european labor markets. In: Handbook of Labor Economics, Vol. 4. Elsevier, pp. 1173–1236. chapter 13

Boeri, T., Cahuc, P., Zylberberg, A., 2015. The Costs of Flexibility-Enhancing Structural Reforms: A Literature Review. OECD Economics Department Working Papers 1264. OECD Publishing.

Bonnet, O., Georges-Kot, S., Pora, P., 2019. Les Contrats à Durée Limitée : Trappes à Précarité Ou Tremplins Pour Une Carrière. Emploi, chômage, revenus du travail. Insee Références

Bono, E.D., Weber, A., Winter-Ebmer, R., 2012. Clash of career and family: fertility decisions after job displacement. J Eur Econ Assoc 10 (4), 659–683.

Bono, E.D., Weber, A., Winter-Ebmer, R., 2015. Fertility and economic instability: the role of unemployment and job displacement. J Popul Econ 28 (2), 463–478.

Brand, J., Davis, D., 2011. The impact of college education on fertility: evidence for heterogeneous effects. Demography 48 (3), 863–887.

Charles, K.K., Stephens, M., 2004. Job displacement, disability, and divorce. J Labor Econ 22 (2), 489–522.

Chen, S., Ours, J.C., 2018. Subjective well-being and partnership dynamics: are same-Sex relationships different? Demography 55 (6), 2299–2320.

Cygan-Rehm, K., Maeder, M., 2013. The effect of education on fertility: evidence from a compulsory schooling reform. Labour Econ 25 (C), 35–48.

Ekert-Jaffé, O., Solaz, A., 2001. Unemployment, marriage, and cohabitation in france. Journal of Behavioral and Experimental Economics (formerly The Journal of Socio-Economics) 30 (1), 75–98.

Ekert-Jaffé, O., Solaz, A., 2002. Couple formation in france: the changing importance of labor market early career path. Journal of Bioeconomics 4 (3), 223–239.

Gaure, S., Røed, K., Zhang, T., 2007. Time and causality: A Monte carlo assessment of the timing-of-Events approach. J Econom 141 (2), 1159–1195.

Gautier, P.A., Svarer, M., Teulings, C.N., 2009. Sin city? why is the divorce rate higher in urban areas? Scandinavian Journal of Economics 111 (3), 439–456.
Goldin, C., 2006. The quiet revolution that transformed women's employment, education, and family. American Economic Review 96 (2), 1–21.
Goldin, C., Katz, L.F., 2002. The power of the pill: oral contraceptives and Women's career and marriage decisions. Journal of Political Economy 110 (4), 730–770.
de Graaf-Zijl, M., van den Berg, G., Heyma, A., 2011. Stepping stones for the unemployed: the effect of temporary jobs on the duration until (regular) work. J Popul Econ 24 (1), 107–139.
Heckman, J., Smith, J., 1995. Ashenfelter's Dip and the Determinants of Participation in a Social Program: Implications for Simple Program Evaluation Strategies. UWO Department of Economics Working Papers 9505. University of Western Ontario, Department of Economics.
Jahn, E.J., Rosholm, M., 2014. Looking beyond the bridge: the effect of temporary agency employment on labor market outcomes. Eur Econ Rev 65 (C), 108–125.
Kalmijn, M., 2011. The influence of men's income and employment on marriage and cohabitation: testing oppenheimer's theory in europe. European Journal of Population/Revue européenne de Démographie 27 (3), 269–293.
Kleven, H., Landais, C., Søgaard, J.E., 2018. Children and Gender Inequality: Evidence from Denmark. NBER Working Papers 24219. National Bureau of Economic Research, Inc.
Lavy, V., Zablotsky, A., 2015. Women'S schooling and fertility under low female labor force participation: evidence from mobility restrictions in israel. J Public Econ 124, 105–121.
Lillard, L., Waite, L., 2000. Marriage, Divorce and the Work and Earning Careers of Spouses. Working Papers wp003. University of Michigan, Michigan Retirement Research Center.
Lillard, L.A., 1993. Simultaneous equations for hazards: marriage duration and fertility timing. J Econom 56 (1–2), 189–217.
Lopes, M. C., 2018. Job Security and Fertility Decisions*Unpublished manuscript*.
Lundberg, S., Pollak, R.A., 2007. The american family and family economics. Journal of Economic Perspectives 21 (2), 3–26.
Lundborg, P., Plug, E., Rasmussen, A.W., 2017. Can women have children and a career? IV evidence from IVF treatments. American Economic Review 107 (6), 1611–1637.
Marinescu, I., 2016. Divorce: what does learning have to do with it? Labour Econ 38 (C), 90–105.
McCrary, J., Royer, H., 2011. The effect of female education on fertility and infant health: evidence from school entry policies using exact date of birth. American Economic Review 101 (1), 158–195.
Mira, P., Ahn, N., 2001. Job bust, baby bust?: evidence from spain. J Popul Econ 14 (3), 505–521.
Monstad, K., Propper, C., Salvanes, K.G., 2008. Education and fertility: evidence from a natural experiment. Scandinavian Journal of Economics 110 (4), 827–852.
Moschion, J., van Ours, J.C., 2019. Do childhood experiences of parental separation lead to homelessness? Eur Econ Rev 111 (C), 211–236.
Myers, C.K., 2017. The power of abortion policy: reexamining the effects of young Women's access to reproductive control. Journal of Political Economy 125 (6), 2178–2224.
Nicoletti, G., Scarpetta, S., Boylaud, O., 2000. Summary Indicators of Product Market Regulation with an Extension to Employment Protection Legislation. OECD Economics Department Working Papers 226. OECD Publishing.
Niedergesäss, M., 2013. Employment, Partnership and Childbearing Decisions of German Women and Men: A Simultaneous Hazards Approach. University of Tuebingen Working Papers in Economics and Finance. University of Tuebingen, Faculty of Economics and Social Sciences.
OECD, 2011. Doing Better for Families. Technical Report.
Oreopoulos, P., Salvanes, K.G., 2011. Priceless: the nonpecuniary benefits of schooling. Journal of Economic Perspectives 25 (1), 159–184.
van Ours, J.C., 2003. Is cannabis a stepping-stone for cocaine? J Health Econ 22 (4), 539–554.
van Ours, J.C., 2006. Cannabis, cocaine and jobs. Journal of Applied Econometrics 21 (7), 897–917.
van Ours, J.C., Williams, J., 2009. Why parents worry: initiation into cannabis use by youth and their educational attainment. J Health Econ 28 (1), 132–142.
van Ours, J.C., Williams, J., Fergusson, D., Horwood, L.J., 2013. Cannabis use and suicidal ideation. J Health Econ 32 (3), 524–537.
Pailhé, A., Solaz, A., 2012. The influence of employment uncertainty on childbearing in france: A Tempo or quantum effect? Demogr Res 26 (1), 1–40.
Prifti, E., Vuri, D., 2013. Employment protection and fertility: evidence from the 1990 italian reform. Labour Econ 23 (C), 77–88.
Prioux, F., 2005. Mariage, vie en couple et rupture d'union. Informations sociales (2) 38–50.
Rege, M., Telle, K., Votruba, M., 2011. Parental job loss and Children's school performance. Review of Economic Studies 78 (4), 1462–1489.
Rica, S.D.L., Iza, A., 2005. Career planning in spain: do fixed-term contracts delay marriage and parenthood? Rev Econ Househ 3 (1), 49–73.
Rindfuss, R., Morgan, S., Offutt, K., 1996. Education and the changing age pattern of american fertility: 1963–1989. Demography 33 (3), 277–290.
Santos, C., Weiss, D., 2016. "Why not settle down already?" a quantitative analysis of the delay in marriage. Int Econ Rev (Philadelphia) 57, 425–452.
Stevenson, B., Wolfers, J., 2007. Marriage and divorce: changes and their driving forces. Journal of Economic Perspectives 21 (2), 27–52.
Svarer, M., Verner, M., 2008. Do children stabilize relationships in denmark? J Popul Econ 21 (2), 395–417.
Verbakel, E., 2012. Subjective well-Being by partnership status and its dependence on the normative climate [Impact du contexte normatif sur le bien-être subjectif par statut d'union]. European Journal of Population 28 (2), 205–232.