



The social impact of labour market flexibilization and its fertility consequences in Italy

Raffaele Guetto, Valentina Tocchioni^{*}, Daniele Vignoli

Università degli Studi di Firenze, Italy

ARTICLE INFO

Keywords:

Temporary employment
Fertility
First births
Potential outcome approach
Propensity score matching
Italy

ABSTRACT

Very low fertility in Italy is a social problem as it is largely involuntary and represents a threat to the continuity of the society and to welfare state accounts. Rising economic uncertainty is considered in the literature as one of the driving forces behind the postponement of childbearing and the reduction in fertility rates in contemporary Europe. Understanding whether employment instability causally and negatively impacts fertility decisions is of fundamental importance to providing clear recommendations to policymakers. To the best of our knowledge, the only study applying a counterfactual approach to the impact of temporary employment on parenthood is an article by Vignoli et al. [11]. The present study replicates such a paper utilizing more recent data for Italy (2016, instead of 2009), thus covering a period encompassing the Great Recession. We adopt the potential outcome approach to causal inference so as to quantify the net effect of having a first job with a temporary vs. permanent contract on the propensity to first-child conception. Our findings confirm a clear-cut causal effect of temporary employment on first-birth postponement. Largely overlapping previous results, we demonstrate how precarious work has become a structural factor discouraging the transition to parenthood among young Italians.

1. Introduction

In the 1980s, a new era of economic insecurity emerged, commonly attributed to various societal changes encompassed by the term “globalization”. These changes included a diminishing significance of national borders in economic transactions and heightened global interconnectedness through advancements in information and technology, accompanied by deregulation, privatization, and liberalization of domestic industries and markets. In particular, numerous European countries have implemented a series of reforms to enhance labour market flexibility. These deregulatory reforms primarily involved the gradual relaxation and endorsement of alternative forms of employment contracts, characterized by reduced bargaining power, diminished social protection, and generally lower wages. The proliferation of flexible work contracts has led to an increase in the instability of career paths. Deregulation reforms took place “at the margin”, that is leaving the insider workforce institutionally sheltered by the reforms while burdening the younger cohorts of labour market entrants with all the demands for flexibility [4,2]. The proportion of temporary contracts among dependent employees aged 15–24 in Europe rose from 22 % in the early '80s to 42 % in 2017, with a significant portion of this increase

occurring during the '90s and subsequent stabilization in recent years. Within the 25–54 age group, the percentage increased from 6 % to 12 % in the 2010s, with a subsequent stabilization of the trend. Across European countries, trends exhibit some heterogeneity within this general context. Notably, Italy stands out as one of the countries with the highest prevalence of temporary employment, reaching approximately 60 % and 16 % in the 15–24 and 25–54 age groups, respectively, in recent years.

Extensive evidence indicates that the youth have become more susceptible to economic uncertainty and diminished job security, which can, in turn, influence their decisions regarding family formation [1]. Rising economic uncertainty, and especially the increase in employment instability, is widely considered in the literature as one of the driving forces behind the postponement of childbearing and the reduction in fertility rates in contemporary Europe [12]. If employment instability exerts a genuine, negative causal influence on fertility, policymakers should aim to increase economic stability as a means of increasing fertility rates. The very low fertility rate (1.24 in 2022) in Italy is largely involuntary and represents a threat not only to the continuity of the society but also to the balance of welfare state accounts.

Nonetheless, concerns have been raised about the possibility of

^{*} Correspondence to: Dipartimento di Statistica, Informatica, Applicazioni “G. Parenti”, Università degli Studi di Firenze, viale Morgagni 59, 50134, Firenze
E-mail address: valentina.tocchioni@unifi.it (V. Tocchioni).

interpreting the negative “effects” of unemployment or temporary forms of employment on fertility in causal terms [7]. A first potential issue is that of *reverse causality*: for instance, more “family-oriented” women employed with a temporary contract may not strive to obtain a permanent contract in light of their desire to become mothers. A second issue, that of *unobserved heterogeneity*, stems from the fact that people are not assigned randomly to a certain type of contract: for instance, poorer subjective well-being and health status may simultaneously increase the chances of being in precarious employment and negatively influence fertility transitions. Understanding whether employment instability causally and negatively impacts fertility decisions is of fundamental importance to providing clear recommendations to policymakers.

To the best of our knowledge, a handful of studies used the instrumental variable approach for dealing with endogeneity in the relationship between temporary employment and fertility (e.g., [9]), whereas the only study applying a counterfactual approach – based on propensity score matching – for (partially) solving the potential endogeneity problem to investigate the causal impact of temporary employment for the transition to parenthood is a recent article by Vignoli et al. [11]. In this paper, which focuses on the Italian case, the authors analysed whether labour market entry through a temporary employment contract, rather than a permanent one, had a causal effect on the probability of conceiving the first child within five years of the first work experience. Based on retrospective data from the nationally representative 2009 Italian Multipurpose Household Survey on Family and Social Subjects – in short, FSS – Vignoli et al. [11] showed a non-negligible first-birth postponement ascribable to a first temporary job. The study also provided us with an in-depth analysis of the heterogeneity of treatment effects by combinations of gender and level of education and found that tertiary educated women are more strongly affected by a first temporary job, whereas, among men, those with low and middle education are more likely to postpone the first birth.

Our replication study aims at assessing the robustness of these findings by using more recent data drawn from the 2016 version of the FSS, conducted by the Italian Institute of Statistics (ISTAT). We replicate the analyses shown in Vignoli et al. [11], based on the 2009 data, and investigate the impact of first labour market entry with a temporary versus a permanent job on potential first-birth postponement, comparing the two sets of analyses. In addition, our replication contributes to the existing study by focusing on younger cohorts of individuals, and by also considering employment spells that started after the onset of the Great Recession.

2. Methodology

Drawing on data from the 2016 edition of the FSS survey, we selected women and men aged 18–49 at the interview date and childless at the beginning of their first employment spell, which had to last at least one year (for more details, please refer to [5]). Overall, the sample consisted of 2783 women and 3178 men for the 2009 survey, and of 1819 women and 1862 men for the 2016 survey. In 2009, among women, 30.6 % had a first temporary employment; among men, 24.2 % had a first temporary employment. In 2016, the percentages of temporary employment increased for both women and men (around 30–35 % overall).

We are interested in estimating the effect of having a first temporary versus a permanent job contract on entering parenthood in the five years following job start, using retrospective (observational) data, where individuals with temporary and permanent jobs might systematically differ in their background characteristics. We faced this issue by using propensity score matching methods under the assumption of selection on observables [10], and we segmented the analysis by gender and survey year. Thus, our treatment variable was a binary indicator W for the type of employment, counterposing temporary job (treatment) to permanent job (control), whereas our outcome variable was the conception of the first child. The causal estimand we aimed to estimate is the Average Treatment effect for the Treated (ATT; [6]), which measures

the difference between the proportion of first-child conceptions under temporary vs. permanent jobs among those who had a temporary job (the treated group; [6]). First, we focused on the effects of having a temporary job (that is, a fixed-term or a project-based job) versus having a permanent job; second, we focused on the effects of having a fixed-term versus a permanent job.

Since each person was only observed in either the treatment or control group, only one of the two potential outcomes was observed for each individual, and we need to estimate the missing outcomes. To this end, we rely on well-known assumptions of *unconfoundedness* and *overlap* ([10]: see for more details on it). Unconfoundedness is a strong and untestable assumption, which is violated whether there exist unobserved variables that affect both the outcome and the likelihood of receiving the treatment. In our study, unconfoundedness might be violated due to the presence of latent (unobservable) variables, such as fertility intentions, family orientation, and career ambitions. Nevertheless, despite these potential confounders, we have information on a large set of background variables. Moreover, we conducted a sensitivity analysis specifically developed to assess if estimates after a matching procedure are robust to the possible presence of unobserved confounders, and our findings were fairly robust to possible hidden bias due to unobserved confounders (see [5], for more details).

The analysis involves two steps. In the first step (*design phase*), the focus was on selecting a sub-sample of units where the distribution of the observed covariates was well-balanced between treated and control groups. Therefore, we used the one-to-one nearest neighbour matching algorithm without replacement with an exact match on age and education to find, for each treated person, one matched control person with similar background characteristics, taking into account a rich set of relevant confounders of the relationship between employment contract and fertility decisions, that is, variables that could reasonably influence both the conception of the first child and the type of contract at labour market entry (e.g., age, partnership). The choice of using the one-to-one nearest neighbour matching algorithm without replacement was based on theoretical considerations and careful empirical evaluations. We opted for matching without replacement because, in our application study, the sample size was sufficiently large to satisfactorily match each treated person with a different control person. Moreover, matching without replacement allowed us to avoid inferential complications due to dependent matched controls. In the second step (*analysis phase*), we imputed the missing potential outcome for each treated unit i , $Y_i(0)$, by using the outcome of her/his matched control, Y_i^C , and estimated the unit-level causal effect, $Y_i(1) - Y_i(0)$, as the difference between the observed outcome for that treated unit and her/his imputed outcome: $Y_i - Y_i^C$.

3. Results

Comparing the results across surveys (see Table 1 below), the potential postponement effects of temporary employment on first-birth conceptions seem stronger in 2009 than in 2016, and the differences between the two surveys are larger for women than for men. The number of treated units and control units is the same because of the matching algorithm (one-to-one nearest neighbour without replacement). In 2009, 7.5 % of women (4.7 % of men) who had a first temporary job would have had the first child within five years from the beginning of their first employment spell if they had, instead, a permanent job, whereas the same figure drops to 4.7 % (4.0 %) in 2016. The gap between the two surveys is even larger when comparing fixed-term versus permanent jobs. A possible explanation for the weakening of the negative impact of temporary employment is the fertility contraction which started in 2010. The underlying nature of such decline, common to most Western European countries, is still a conundrum for demographers and sociologists, and Italy is no exception. In fact, indicators of the macroeconomic situation could only account for part of the

Table 1

ATT on first-birth conception by the number of years after the beginning of the first employment spell, type of contract and survey year. Percentage values.

Women					
Temporary vs permanent					
	2009		2016		
n treated/control	845		639		
# Years after employment start	ATT	Confidence interval	ATT	Confidence interval	
1	-1.30	[- 2.90; 0.30]	0.00	[- 1.55; 1.55]	
2	-1.78	[- 4.12; 0.57]	0.47	[- 1.87; 2.81]	
3	-2.84	[- 5.73; 0.05]	0.16	[- 2.61; 2.92]	
4	-4.85	[- 8.08; - 1.62]	-0.94	[- 4.11; 2.24]	
5	-7.46	[- 10.89; - 4.02]	-4.70	[- 8.24; - 1.16]	
Fixed-term vs permanent					
	2009		2016		
n treated/control	694		502		
# Years after employment start	ATT	Confidence interval	ATT	Confidence interval	
1	-0.58	[- 2.29; 1.14]	-0.20	[- 2.05; 1.65]	
2	-0.86	[- 3.43; 1.70]	0.20	[- 2.57; 2.97]	
3	-2.88	[- 6.13; 0.36]	-1.00	[- 4.37; 2.37]	
4	-5.91	[- 9.55; - 2.26]	-1.59	[- 5.39; 2.21]	
5	-9.22	[- 13.12; - 5.33]	-4.38	[- 8.50; - 0.27]	
Men					
Temporary vs permanent					
	2009		2016		
n treated/control	769		583		
# Years after employment start	ATT	Confidence interval	ATT	Confidence interval	
1	-0.26	[- 1.73; 1.21]	0.17	[- 1.43; 1.77]	
2	-1.04	[- 3.04; 0.96]	-0.52	[- 2.48; 1.45]	
3	-1.56	[- 3.95; 0.83]	-2.41	[- 4.95; 0.13]	
4	-3.25	[- 6.04; - 0.47]	-2.93	[- 5.78; - 0.07]	
5	-4.68	[- 7.71; - 1.66]	-3.96	[- 7.04; - 0.88]	
Fixed-term vs permanent					
	2009		2016		
n treated/control	670		506		
# Years after employment start	ATT	Confidence interval	ATT	Confidence interval	
1	0.30	[- 1.23; 1.83]	0.00	[- 1.80; 1.80]	
2	-1.49	[- 3.71; 0.72]	-1.19	[- 3.47; 1.10]	
3	-2.69	[- 5.39; 0.02]	-3.56	[- 6.50; - 0.61]	
4	-3.88	[- 6.86; - 0.90]	-4.15	[- 7.45; - 0.85]	
5	-5.67	[- 8.95; - 2.39]	-4.74	[- 8.24; - 1.25]	

Note: ATT on first-birth conception for the 2009 survey are taken from Vignoli and colleagues [11].

fertility contraction, which suggests that fertility declined also due to general perceptions of uncertainty about the future even in countries and social groups (e.g., the permanently employed) that were only marginally hit by the economic crisis [12]. In light of this generalized trend, temporary employment could make less of a difference in fertility choices.

Notwithstanding the differences, our replication confirms the overall finding of Vignoli and colleagues [11] that entering the labour market with a temporary contract induces a potential postponement of first-birth conceptions. Despite the effect increases (almost) monotonically over the first five years since the beginning of the first job, the gap becomes significant just some years after the beginning of the first employment spell (for women in 2016 only for the fifth year).

When it comes to the heterogeneity by educational level, the results indicate that women with tertiary education are affected the most, with a probability of conceiving the first child within five years since the start of the first employment episode that is reduced, *ceteris paribus*, by 13 p.

p. in the case of a temporary contract, compared to a permanent one (in 2009 the effect was even stronger, with a gap around 16 p.p.). Thus, women with tertiary education experience stronger first-birth postponement because they are – at least in the Italian context – particularly exposed to higher opportunity-costs compared to the less educated.

The results for lower-educated women, instead, differ from those of Vignoli and colleagues [11], notwithstanding the high estimation uncertainty due to the small sample size. While the original analyses based on the 2009 FSS data found no effects of the type of first job contract, the new analyses based on the 2016 FSS survey suggest that lower-educated women with more uncertain contractual conditions seem to opt for parenthood earlier than their counterparts having a better contractual position – although the effect size is very small. Lower-educated women, indeed, have the least to lose in case of maternity leave, because of lower wages and poorer career expectations. This finding represents a novelty for the Italian context, while the accelerating effect of unemployment on the transition to parenthood has been emphasized in other contexts (like Germany and Denmark: [8]).

Heterogeneity of treatment effects by level of education differs across the two surveys also among men. The original study highlighted a stronger first-birth postponement among men with the lowest educational qualifications, with a 7 p.p. postponement effect after five years since the start of the first employment episode. Our findings reveal that, in more recent years, differences by level of education among men tend to smooth and lose statistical significance, with the partial exception of upper-secondary educated men, whose percentage of potential postponement of first birth conceptions around 5 p.p. after five years since labour market entry.

4. Implications

Our results largely overlap with those obtained by Vignoli and colleagues [11], demonstrating how precarious work has by now become a structural factor discouraging the transition to parenthood among young Italians. Our causal conclusions on the negative impact of labour market flexibilization on fertility may be reinforced in future studies by using panel data with specific questions related to personality traits and family preferences, instead of retrospective data as in our case, which represents a limit of our study. In addition, future studies should adopt a couple approach, whereas we could only implement separate analyses by gender.

Overall, our results stress the importance for policymakers to take into account the potential adverse effects on fertility rates that could arise from the implementation of deregulation reforms introducing strong labour market dualism. The benefits of promoting economic stability for the youth, as a strategy to boost fertility rates, extend beyond mere considerations of population and economic growth. Due to four decades of low fertility, Western societies are undergoing an aging demographic shift, with Italy leading the global trend in population aging. Reversing the decline in fertility is crucial for addressing the challenges posed by the old-age dependency ratio and ensuring a balance in welfare state accounts. Furthermore, low fertility in Western countries is often involuntary, and Italy exhibits the highest disparity in Europe between the desired number of children (typically around two) and the actual number of children [3]. The inability to fulfil the desire for (more) children can have profound consequences for individuals, impacting their subjective well-being.

Funding

This work was supported by the European Union's Horizon 2020 Research and Innovation Programme / ERC Grant Agreement No 725961 (EU-FER project "Economic Uncertainty and Fertility in Europe," PI: Daniele Vignoli), as well as the Italian Ministry of University and Research, 2017 MiUR-PRIN Grant Prot. N. 2017W5B55Y ("The Great Demographic Recession," PI: Daniele Vignoli). We acknowledge

funding from Next Generation EU, in the context of the National Recovery and Resilience Plan, Investment PE8 – Project Age-It: “Ageing Well in an Ageing Society” [DM 1557 11.10.2022]. The views and opinions expressed are only those of the authors and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- [1] G. Alderotti, D. Vignoli, M. Baccini, A. Matysiak, Employment instability and fertility in Europe: a meta-analysis, *Demography* 58 (2021) 871–900.
- [2] P. Barbieri, S. Scherer, Labour market flexibilization and its consequences in Italy, *European Sociological Review* 25 (6) (2009) 677–692.
- [3] E. Beaujouan, C. Berghammer, The gap between lifetime fertility intentions and completed fertility in Europe and the United States: a cohort approach, *Popul. Res. Policy Rev.* 38 (4) (2019) 507–535.
- [4] G. Esping-Andersen, M. Regini, *Why Deregulate Labor Markets?* Oxford University Press, Oxford, 2000.
- [5] Guetto R., Tocchioni V., Vignoli D., The Causal Impact of Temporary Employment on First Births in Italy: An Update. *DiSIA Working Paper 2023*, 06, 2023, pp. 1–21.
- [6] G.W. Imbens, D.B. Rubin, *Causal Inference in Statistics, Social, and Biomedical Sciences*, Cambridge University Press, Cambridge, US, 2015.
- [7] M. Kreyenfeld, Causal modelling in fertility research: a review of the literature and an application to a parental leave policy reform, *Comp. Popul. Stud.* 46 (2021).
- [8] M. Kreyenfeld, G. Andersson, Socioeconomic differences in the unemployment and fertility nexus: evidence from Denmark and Germany, *Adv. Life Course Res.* 21 (2014) 59–73.
- [9] F. Modena, C. Rondinelli, F. Sabatini, Economic insecurity and fertility intentions: the case of Italy, *Rev. Income Wealth* 60 (2014) S233–S255.
- [10] P.R. Rosenbaum, D.B. Rubin, Assessing sensitivity to an unobserved binary covariate in an observational study with binary outcome, *J. R. Stat. Soc. Ser. B: Methodol.* 45 (2) (1983) 212–218.
- [11] D. Vignoli, V. Tocchioni, A. Mattei, The impact of job uncertainty on first-birth postponement, *Adv. Life Course Res.* 45 (2020), 100308.
- [12] D. Vignoli, R. Guetto, G. Bazzani, E. Pirani, A. Minello, A reflection on economic uncertainty and fertility in Europe: the narrative framework, *Genus* 76 (1) (2020), 28.