The Fertility Transition in the Area of Bologna: an Analysis based on Longitudinal Data. The Case of Granarolo from 1900 to 1940

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Abstract

The aim of the study is to highlight some key points of Italian fertility decline in the first decades of the twentieth century, by using a micro longitudinal approach. The research is based on new individual-longitudinal data and life-course histories from Granarolo, an Italian municipality bordering the town of Bologna. By using Cox models, hazards of having a child are estimated for married women between 1900 and 1940. Individual fertility propensity by marriage cohort and period is assessed, controlling for differences in socio-demographic characteristics and describing the changing reproductive strategies. Moving from one marriage cohort to the next one, the hazard of having a first child progressively increased. On the contrary, probabilities of giving birth progressively fell when women reached higher parities. Fertility continued to decrease even if the Fascist Regime promoted a pro-births campaign against fertility decline. Clear differences in fertility were also visible between socioeconomic groups: the lower fertility of upper classes is confirmed even in a rural community such as Granarolo, whereas sharecroppers' families remained tied to their own traditional higher fertility.

Introduction

This paper focuses on the Italian fertility transition during the first forty years of the twentieth century. The research is based on new individual-longitudinal data and life-course histories from Granarolo, an Italian municipality bordering the town of Bologna. This municipality is a typical example of the transition from a rural-oriented economy to a new economic system based on industrialization and large scale capitalist agriculture. Civil population registers are used to reconstruct individual biographies.

Our aim is to highlight some key points of Italian fertility decline in the first decades of the twentieth century, using a micro longitudinal approach. Previous studies have already provided aggregate estimates at national and regional levels (Ge Rondi et al., 2008), whereas very few take into account micro level data and focus on individual behavior. If the evolution of Italian fertility across the last two centuries is already clear, the mechanisms that led Italian couples to change their attitude towards reproduction are still not completely understood. The clear knowledge of such mechanisms would allow us "to fill the gap" in the history of generations (Van Bavel, 2004; Reher & Sanz-Gimeno, 2007). Therefore we intend to re-interpret and explain these aggregate measures in the light of evidence from our micro-level analyses. With this in mind, our main aim is to detect the timing of the fertility decline in the area of Bologna and the changing fertility propensity by cohort and period.

Some basic preliminary questions concern fertility trends in Granarolo. For example, at what point fertility decline began. Once it started, was this decline a steady irreversible process or did it slow or stop in some historical phases? During the period under study, Mussolini and his Fascist Regime promoted a pro-birth policy (Ipsen, 1997; Treves, 2001). It comes to mind to ask if these

policies were really effective. In order to answer this question, we rely on micro longitudinal data. It is difficult to detect the impact of these demographic policies basing only on aggregate data, since it is not possible to investigate the effect related to the individual behavior.

In the period under study, two world wars occurred while significant socio-economic transformations were taking place (urbanization, the first phase of industrialization and agricultural modernization). To what extent these changes conditioned the process of fertility decline is a matter that can be understood only through the use of micro-level data and life-course approaches. It is also important to assess the role played by socioeconomic status and to identify which socioeconomic groups started to control the number of children. It is generally recognized that that higher social groups acted as forerunners in this decline (Livi Bacci, 1977 and 1986).

Adopting an event history analysis approach, hazards of having a child will be estimated for married women between 1900 and 1940. Individual fertility propensity by marriage cohort, period and socioeconomic status (SES) will be assessed, controlling for bio-demographic characteristics and infant mortality.

Another key question regards the way in which reproductive behavior was reshaped. Taking into account birth orders, had policies and socio-economic transformations more influence on first parity mothers or on second and higher parity ones? To answer this question, we propose to adopt a specific stratified Cox Model in order to estimate fertility hazards at different parity, distinguishing by marriage cohorts and periods.

The paper is organized as follows. Firstly, findings of previous research on fertility decline in Italy are briefly summarized. Secondly, pro-birth policies of the Fascist regime are summarized. Then, socio-economic characteristics and fertility tendencies in the area under question are described. Afterwards, sources and method are presented and results from a multivariate analysis are shown and discussed.

Previous Studies on Fertility Decline in Italy from 1900 to 1940

Although the population changes in Italy followed the general pattern of all other European countries, Italian fertility decline started later (Coale and Watkins 1986). Excluding France, which experienced an early transition, the European Fertility Project found that fertility decline began primarily in the heart of Europe and only later in the extreme southern and eastern regions (Watkins 1986). A significant drop in fertility levels occurred in Italy, Greece, Portugal and Spain in the first decades of the Twentieth century (Livi Bacci, 1977 and 1986). The later fertility transition of Southern European Countries was mainly due to the slower development in terms of education, income and industrialization. On average, an Italian woman born in the mid-nineteenth century gave birth, with significant geographical and social differences, to about five children. This fertility level was not substantially dissimilar from those of the other European countries (Livi Bacci 1977). At the beginning of the twentieth century something began to change in Italy and with the 1948 cohort the TFR figures fall below 2 children per woman. This decline was characterized by a dramatic drop in births of parity greater than 2 (Salvini and Santini, 2007; Santini, 1974 and 2008).

In Italy, family limitation spread earlier and more rapidly in northern provinces than southern ones (Livi Bacci 1977) because of the differences in socioeconomic development. At the time of Unification, southern Italy was behind the rest of the country in terms of literacy, education, and infrastructural transport system. So this slow socioeconomic development concurred in slowing down fertility transition. Previous regional studies on fertility decline in Italy have mostly been based on official aggregative data, providing cohort and contemporary total fertility rates from the end of the nineteenth century at national and regional levels (Ge Rondi et al., 2008; Salvini and Santini, 2007; Santini, 1974 and 2008). These studies make it possible to distinguish the different phases of the fertility decline at national and regional level. As a matter of fact, in northern Italy the cohorts born between 1920 and 1945 suddenly show TFR values below the replacement level, whereas the southern regions continued at higher levels. In these terms, nuptial behavior played a

fundamental role. Permanent celibacy of men and women, although varying from area to area, does not show any substantial variation until the cohorts born between 1920 and 1930.

As already said, very few micro analyses focused on Italian fertility during the first decades of the nineteenth century. These studies generally showed that the first SES groups controlling fertility were namely the upper class and the bourgeoisie (Salvini, 1990), confirming that higher socioeconomic status groups acted as forerunners in fertility decline (Livi Bacci, 1986). Taking into account some communities in Northern-Central Italy, more recent studies based on micro data have clearly shown that, even before the fertility decline and the diffusion of contraceptive techniques, household organization and family structures could shape the reproductive behavior of couples (Breschi et al. 2000; Breschi et al. 2010; Kertzer and Hogan, 1989; Rettaroli and Scalone, 2012). Other studies that combined micro census data and indirect fertility estimation techniques (own-children method) have shown the still existent link between SES and fertility (Pizzetti, Fornasin and Manfredini, 2012; Rettaroli and Scalone, 2009) in the 1920s and 1930s. In theoretical terms, the fertility decline in Italy easily reflects the adjustment-innovation paradigm (Carlsson, 1966). On the one hand, urbanization, industrialization and female workforce participation drastically reduced the advantages of having a higher number of children. Therefore couples adjusted their fertility levels as a consequence of the socioeconomic changes that were progressively taking place in Italy. On the other hand, new habits, attitudes and knowledge about contraceptive methods spread from some groups (pioneers/forerunners) to the rest of society.

Pro-births Fascist policies

During the inter-war period, in Italy there was a sudden fertility drop (Gini 1930) as in many Western countries. Nowadays it is generally accepted that this fall was a temporary reaction to the economic crisis and the threat of war. According to the interpretations given by leading demographers of that time, this change in fertility level was mainly associated to cultural trends,

individualization, consumerism and a growing aspirations among women for self-realization in the work places (Van Bavel 2009). As a reaction, during the 1930s the Fascist regime promoted a demographic policy to increase the number of births (Ipsen, 1997; Saraceno, 1995; Treves, 2001; Livi Bacci 1977). Mussolini was concerned about the fertility decline that was taking place in Italy during those years. To tackle the "danger of depopulation", he started a series of demographic measures and policies that he named the "battle of births". He believed that the power of a nation mainly depended on a numerous population, since "the relation between the size of population and the economic and military power of the nation is obvious" (Gini 1930, p. 689). A law that taxed bachelors between 25 and 65 years was firstly introduced in 1927. This tax amount was further increased in 1933 and 1937, whereas large families could rely on tax exemptions. The government also established that spouses would have the priority in public and private hiring. Marriage loans were introduced, paid maternity leave was extended to all women working for an employer and monetary prizes were given to the largest families of each Italian province. These measures were both practical and ideological. As Corrado Gini wrote (1930, p. 687), "such payments […] cannot be considered as compensation […] they do contribute to a program which aims at honoring maternity and glorifying family-life". In his view, those pro-birth measures were "provisions for cultivating and reinforcing those feelings of family solidarity, national loyalty, and religious sentiment, which […] represent powerful allies in the struggle against the invading rationalistic egoism". At the same time, heavy penalties for those favoring or procuring abortion and provisions against circulation and commercialization of contraceptives were set in the new Criminal Code (the 1930 Rocco Code). Other policies discouraged working mothers, and encouraged mothers to be housewives. Along with strengthening of pro-birth policies, the government also carried out a campaign propaganda involving the most important newspapers and magazines (Caporali, Golino 2010). Nevertheless, the fascist pro-birth policy did not succeed and had only a limited effect on the reproductive behavior of women who married in that time (Livi Bacci 1977).

Main Demographic and Socioeconomic Tendencies in the Study Area

The present study considers the village of Granarolo, a rural municipality situated in the suburban hinterland of Bologna which is the main town of the Emilia-Romagna region. The area of Bologna includes part of the Po Valley on the northern border and the first hills of the Appennini Chain on the southern area.

(Map 1 - here)

So it was naturally crossed by people that travelled from South to North Italy and from East to West. Consequently this privileged position made Bologna an important centre of commerce and manufacturing activities.

During the period in question, the main economic sector of Granarolo was still agricultural. In the middle of the nineteenth century, 79 per cent of the working population was employed in the agricultural sector with 25 per cent of farmers and sharecroppers; the industrial sector counted 17 per cent of the workers and most of them were employed in textile activity (Bellettini, 1971). Almost one hundred years later in the 1931 census, agriculture was still the most relevant sector (72 per cent), whereas 20 per cent of the workers were employed in industry and manufacturing activity (Istituto Centrale di Statistica del Regno d'Italia, 1937). In the first phase of industrialization, part of the manufacturing activities was done outside the factories by people working at home on farms or in small workshops. Therefore women were involved both in agricultural and proto-industrial activities (Villani 1989; Cazzola 1985).

Before industrialization, Granarolo and the other villages close to Bologna were mostly populated by two social groups tied to the agricultural sector: those who were bound by sharecropping contracts and those engaged in wage labour. Under pressure from their landowners, the sharecroppers could not abandon the multiple-family household living and they continued to

have a higher number of children and to live in large complex-family households (Angeli 1983; Barbagli 1994; Poni 1977). From this point of view, the economy played a strong role in the household settlements for centuries. As a matter of fact, from the beginning of the Twentieth century, the traditional sharecropping economy steadily reduced under the impact of a rapid development of large-scale, capitalist agriculture which took place on the plains to the north-east of the town (Kertzer and Hogan, 1989; Cazzola, 1996). In the first decades of the twentieth century, this area was progressively transformed by some high impact socio-economic processes, such as urbanization and first phase industrialization. However, important contingents of traditional sharecropping households still remained well into the twentieth century in the southern hilly area and in the northern zone bordering on the city (Kertzer and Hogan, 1989). The development of the manufacturing activities, of the transport infrastructures and the sanitary system attracted a growing migration flux from the surrounding villages, feeding the demographic growth and pushing the urbanized area outside the medieval walls into the nearby countryside (Scalone and Del Panta, 2008). Concerning the 1920s and the 1930s, the Fascist regime promoted a further development of the town, by building and expanding some important infrastructures like the train station (Gallingani, 2004). Since the train station of Bologna was one of the most important in Italy, many mechanical factories were built in the surrounding area, employing an increasing number of workers. The population of Granarolo grew in the first two decades of the twentieth century and then remained stable at about 5,000 inhabitants until 1931. The following slight decrease (figure 1) is probably due to the migration flux toward the nearby town of Bologna (Scalone and Del Panta, 2008).

(Figure 1 - here)

The rural hinterland of Bologna was characterized by the typical Italian sharecropping economy based on large-scale households. Previous studies about the influence of kin on fertility in pre-and

post-transitional periods and the peculiarly high fertility level of sharecropping families indicate that a newborn child represented an asset to sharecroppers, since children often performed light agricultural tasks (Kertzer and Hogan, 1989; Rettaroli and Scalone, 2009, 2012). Since land was obtained under temporary contracts and access was determined by the availability of human capital, households combining a large number of working-age males with solid farming experience were in a better position to get the best and largest farms to cultivate (Doveri 2000). This is the reason why the demand for children, which constituted the future household work force, was a pressing and vital issue for sharecroppers. Here the Easterlin-Crimmins theory of fertility (1985) is confirmed: in which socioeconomic factors can affect reproductive behavior influencing the demand and supply of children as well as the cost of fertility control. It is therefore possible to hypothesize that in sharecroppers' households the relative cost of children was lower, determining higher demand. In addition, the duration of sharecropping contracts was shorter in these lands and even after some years landlords could change and select a more productive sharecropping family. On the other hand, even sharecroppers' families were prone to migrate, since they constantly searched for farms that offered better conditions. Such migration fluxes generally came from nearby communities in the neighboring countryside and migrants did not culturally differ from the residents.

A glance at marital fertility in Granarolo: levels and structures

Previous micro-analytical studies already took into account the reproductive behavior in some communities of the Bologna area: the nearby parishes of San Donnino and San Nicolò from 1819 to 1900 (Rettaroli and Scalone, 2012) and the village of Casalecchio from 1861 to 1921 (Kertzer and Hogan, 1989). These studies confirmed that pressure from landowners prevented sharecroppers from abandoning their multiple-family households and having a higher number of children. According to another study on two urban parishes in Bologna, sharecroppers still had the highest fertility level during the 1930s (Rettaroli and Scalone 2009).

The study on San Donnino and San Nicolò (Rettaroli and Scalone, 2012), two rural parishes between the northern border of Bologna and Granarolo, also indicated that married women in this area were already using fertility control methods at the end of the nineteenth century. Indeed the m index of Coale and Trussel (1978) was significantly higher than 0.200 for the period 1861-1900. However, in San Donnino and San Nicolò, during the last decades of the nineteenth century, marital fertility still remained at high levels, about 6.6 children per each married woman older than 20 (TMFR20). As a matter of fact, this level was still very far from a real fertility decline (Rettaroli and Scalone, 2012).

(Table 1 - here)

A declining fertility trend is evident when considering the marital fertility levels. Table 1 shows total marital fertility rates from age 20 (TMFR20) for married women in Granarolo between 1900 and 1919, and between 1920 and 1940. It appears that marital fertility declined from 4.7 for the first cohort of married women to 3.5 for the last one. Even if age at first marriage was quite stable, passing from 24 to 23.7, it is interesting to note the second marriage cohort anticipated its age at last birth from 35.1 to 32, subtracting more than 3 years from reproductive life.

Data and Selected Sample

The present paper is based on the Population Register (Anagrafe) of the Municipality of Granarolo. This register contains information on all the households of Granarolo, supplying individual information such as name and family name of each household member, profession, paternity and maternity along with their dates of birth, death, marriage(s) and movements into and/or outside the household. This means that after registering a family in a new file card, municipality officers continuously noted any possible changes, also registering when they occurred.

New born or immigrant family members were registered, dead or emigrated ones were cancelled. Thus we know when a new resident entered and left Granarolo, reducing the risk of unobserved migrations. Using these family files made it easy to reconstitute all individual and female reproductive histories. We know with considerable precision dates of childbirth and women at risk of giving birth in a given period. It is relatively easy to reshape this information in a longitudinal form suited for event history analysis. We reconstructed the female reproductive career, by linking their date of marriage to their children's date of birth.

Relying on these data we take into account reproductive histories of 1,545 women married in Granarolo from 1900 to 1940. We also rely on the additional survey on women fertility carried out at 1931 census (Istituto Centrale di Statistica del Regno d'Italia 1936) that reported the numbers of dead and surviving children for all women resident in Granarolo at census time. Thanks to this information and the availability of vital event registers, we can further check the reproductive life we constructed basing on Population Register information.

Models

We observed all the women married between 1900 and 1940 in order to estimate their hazard to give birth. So we followed them from their marriage until age 49 at the end of their reproductive life. If a woman died or migrated before reaching the age of 49, we censored that observation. The time to multiple births for the same woman was modeled by means of a stratified Cox proportional hazards model. The stratification variable was the failure order (birth episode), therefore a different baseline hazard function was assumed for each episode. This method is known as the conditional risk set approach and was first proposed by Prentice, Williams, and Peterson (1981) (Hosmer and Lemeshow, 1999). The main assumption is that a woman is not "at risk" of a second event (birth episode) until the first one has occurred and so on. The observation period starts at the woman's marriage and the conditional risk set at time *t* for a specific event is made up of all women under

observation at time *t* that have had the previous event. Time to each event was measured from the previous one.

To evaluate if the effect of covariates varied by birth episode (first episode, second episode, and so on) we also tested the interaction between each covariate and birth episode or parity. The variables maternal age, period and child death were included in the model as time-varying covariates.

In the presence of multiple ordered events, failure times are correlated to each mother, violating the hypothesis of independence between different failure times. This assumption is generally required in traditional event-history analyses. To take into account this aspect, robust standard errors were estimated by adjusting the variance-covariance matrix of the regression coefficients (Lin and Wei, 1989). All statistical analyses were carried out with STATA (release 12; StataCorp, College Station, TX).

Variables and Expected Effects

Table 2 shows the set of covariates used in our multivariate analyses. Period time dependent covariate splits the time of analysis in five intervals: 1900-1914 (pre-war period and reference category), 1915-1918 (World War I), 1919-1926 (post-war period, first industrialization, expansion of the urban area of Bologna), 1927-1939 (pro-fertility policy of the Fascist Regime), ≥1940 (World War II, post-war period, economic growth and development). According to the fertility trends estimated at aggregate level for Italy, we expect a gradual fertility decline with more remarkable decreases during war times and a possible increase during the 1930s, as a consequence of the pro-birth policies.

We also include a covariate that refers to women's dates of marriage. We grouped these dates in order to have four cohorts of marriage: 1900-1909 (reference cohort category), 1910-1919, 1920-1929 and 1930-1940. As a matter of fact, we took into account the entire female reproductive biography and therefore we kept on tracking their children's births in the following twenty years. Lower fertility propensity than the first reference cohort is expected for the next marriage cohorts.

(Table 2 - here)

Another group of variables is also included in order to control for the effects of bio-demographic and socioeconomic factors. At individual level, the estimated model includes the survival status of the previous birth to control for the effects of infant mortality on fertility. Several studies already demonstrate that infant mortality can potentially affect natural fertility (Knodel, 1988; Preston, 1978), since a positive association between the two variables has been found in many pre-transitional populations. Previous work (Rettaroli and Scalone, 2012) on two rural parishes bordering Bologna already demonstrated the existence of a strong "substitution effect" - an increase in the probability of having another child after the death of the most previous one. Possible explanations involved both behavioral and physiological factors. To control for this effect, we included a time-varying covariate indicating a child death before a specific birth episode. After a child death, the interruption of breastfeeding and the infecundability period increased the woman's risk of getting pregnant. However, some scholars also sustained the so-called 'replacement of descendants' hypothesis, in which couples that lost a child deliberately wanted to replace him with another one (Knodel and Van de Walle, 1967). Therefore we expect to find a higher risk of childbirth after the death of a child.

The physiological and biological capacity to give birth is obviously dependent on a woman's age. This effect is taken into accounted by including a categorical time-varying covariate consisting of four age groups with age 15-19 as a reference category. In these terms, we expect a declining risk of childbirth for higher age.

At household level, we take into account the socioeconomic status of the household head, based on the reported profession of the household head in the Population Register. Farmers, smallholders and sharecroppers, who could rely on a stable contract, were in the first category "Farmers and sharecroppers". The upper SES group was formed by the "well-off", including artisans,

shopkeepers, traders, clerical workers, teachers and landowners. The "rural daily wagers" group includes the rural and unskilled workers that were named "braccianti" and were employed on a daily basis. Their living conditions were precarious. Lower skilled and unskilled workers not directly involved in agriculture were grouped into a separate category. In a residual category named "other occupation", we include lower apprentices, the unemployed, the retired and people whose professional title was note registered. In these terms, they represent the poorest group of the population. As is clear, farmers and sharecroppers were the largest social group.

In many cases, the occupation of the household head was reported only once, when the family file was created. Therefore socioeconomic status covariate has been constructed only referring to the profession at the time the family was registered in the Population Register. As a consequence, SES has to be considered a time-invariant covariate.

A higher probability of birth is expected for women living in sharecropping households, since sharecroppers needed larger size families, and in their domestic economy children represented an economic asset. In contrast, rural laborers and daily wagers are expected to have lower fertility since children did not play any role in their domestic economy. The socioeconomic groups that were not involved in the agricultural sector were more exposed to new attitudes and knowledge concerning fertility control. Consequently lower fertility levels are expected for them.

Results

Table 3.1 displays estimates for a model with all covariates and interactions between parity (birth order) and cohort of marriages, whereas table 3.2 shows another model with interactions between parity and period.

Before turning to cohort and period effects something should be said about the control variables. The effect of child death is as expected and confirms the "substitution effect" in the area, because we find that the risk of having another child increased considerably and significantly as a consequence of a previous child's death. Married women between fifteen and nineteen show the

highest fertility risk. The hazard gradually declines in following age classes. As expected, women older than forty were significantly less likely to give birth.

(Table 3.1 - here)

Clear differences in fertility become visible between socioeconomic groups: the women in sharecropping and farming families registered higher hazard of giving birth than did those in higher socioeconomic class, laboring and rural wage-earning groups. The residual category that grouped the other occupations (the lowest professions and poorest people) registered the lowest fertility risk. Hazard ratios of upper class and non-rural working groups were almost on the same level, about 0.85 (14 per cent lower than sharecroppers and farmers). The hazard of rural daily wagers was only 6 per cent lower than the sharecroppers without any statistical significance.

Turning to the period effect, fertility significantly dropped during World War I. It is possible to see the effect of a post-war recovery in the following years (from 1919-1926). Surprisingly, during the 1930s, when the Fascist Regime pushed its pro-fertility campaign, the hazard of giving birth fell again, since it was 14 per cent lower than the period between 1900 and 1909. The decline continued inevitably during War World II dropping to a much lower level in the years following 1940.

What is perhaps even more interesting is to look at the interactions between parity and marriage cohort effects, since they capture the changing reproductive strategy of the couples married between 1900 and 1940. In table 3.1 coefficients and hazard ratios corresponding to marriage cohorts refer to parity one (see also figure 2.1).

(Figure 2.1 - here)

Moving from one marriage cohort to the next one, the hazard of having a first child progressively increased. That means women married between 1910 and 1919 and between 1920 and 1929 had

respectively 47 and 50 per cent higher risk of having their first child, whereas the marriage cohort that was formed in the 1930-1940 period had about a double risk of having a first child. Looking at "parity * marriage cohort" interactions (table 3.1), it is possible to see that the first three marriage cohorts (1900-1909, 1910-1919 and 1920-1929) had almost the same risk of experiencing a second birth episode, whereas only the spouses between 1930 to 1940 registered a more sensible drop (0.84) (see also figure 2.1). It is also interesting to take into account the hazard to have a third child having already had two. The probability of the women married between 1910 and 1919 is 11 per cent lower than the spouses in the first 1900-1909 cohort of marriage, while the women belonging to the two following marriage cohorts experienced a stronger reduction, respectively -31 and -40 per cent. Looking at the next parity, the probability of having a fourth child after two previous ones already decreased by 31 per cent when considering women married in the second period between 1910 and 1919. Women married between 1930 and 1940 had a 43 per cent lower probability of having a fourth child than the ones married in the first decade of the twentieth century. It also appears that the probability to have five children progressively reduces from one cohort to the next.

(Table 3.2 - here)

(Figure 2.2 - here)

We also estimated how the hazard of giving birth at different parity changed by period. These estimates are based on coefficients of the interaction model reported in table 3.2 (see also figure 2.2). According to these results, risks of first birth increased in almost all periods, even during World War I. After reaching its peak between 1915 and 1918, it slightly falls afterwards but without returning below the 1900-1914 level. Contemporary, fertility hazards at higher parities significantly decreased. Only during the post-war period between 1919 and 1926 probabilities of having a child at higher parities slightly recovered. Afterwards they irreversibly decreased.

In these terms, the observed decline in fertility from 1900 to 1940 was mainly concentrated on the parities higher than one. In addition, the Fascist demographic policy seems to have some more effect on parity one: probability of having a first child soon after marriage significantly increased, whereas it evidently decreased at higher parities (figure 2.2).

Conclusion

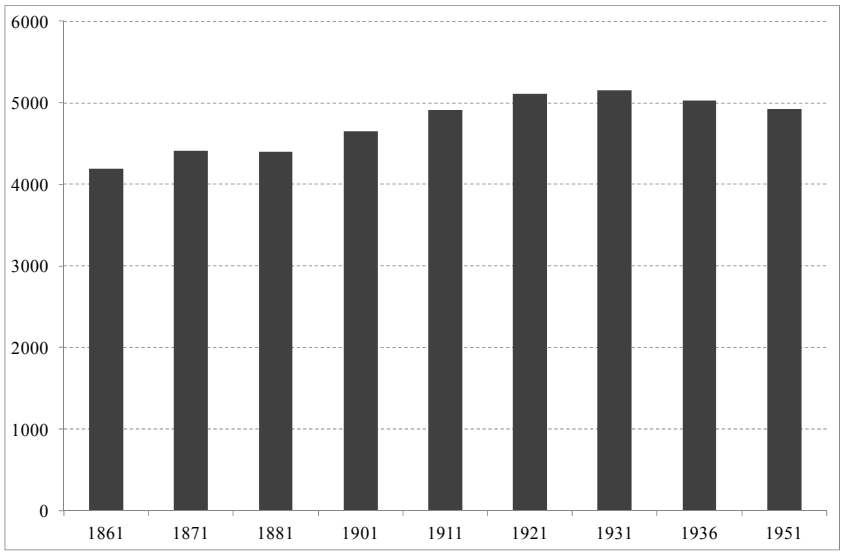
In this paper, we consider the fertility decline in a rural village on the border of Bologna in the first half of the twentieth century. Firstly, we described the changing reproductive strategies of the women who married between 1900 and 1940. Moving from the 1900-1909 marriage cohort to the next ones, probabilities of giving birth progressively fell when women reached higher parities. On the contrary, probability of having the first child progressively increased at each new marriage cohort. As soon as women were somehow able to control their fertility, they anticipated first childbirth and postponed higher order births.

Secondly, we demonstrated that in Granarolo fertility decline was an irreversible process. With the exception of a slight recovery during the post-war period (1919-1926), it never stopped. Fertility continued to decrease even if the Fascist Regime promoted a pro-births campaign against fertility decline. These interventions failed with larger families and multi-parity women, who could not afford another child. Probably the support offered by the Regime was not enough. As a matter of fact, these policy interventions were attempted during a severe economic crisis, the Great depression of the 1930s that affected the world economy also impacting on the Italian one. In addition, when these policies were set up, new norms and attitudes to fertility control were already well rooted in Italian society (Livi Bacci 1977). It is interesting to note that Granarolo was mainly a rural community and the majority of its population was still tied to the agricultural activities during the whole period in question. In these terms, we demonstrated that an urban environment is not the unique scenario for fertility transition. In these terms, the role of upper classes is confirmed even in

a rural community such as Granarolo. It is evident that non-rural workers did follow them, whereas sharecroppers, farmers and rural daily wagers still experienced higher fertility risks. Finally it is interesting to note that while the reproductive behavior of the other groups was converging toward a lower fertility level, the sharecroppers' families remained tied to their own traditional higher fertility. Despite the changes occurring around them, this group was not able to abandon their typical reproductive behavior mostly due to the necessity of their traditional domestic economy.

Map 1 - Geographical localization of Bologna and Granarolo

Figure 1 - The Population of Granarolo from 1861 to 1951



Source: Population Census, Minister of Agriculture, Commerce and Industry (from 1861 to 1921), Institute of Central Statistics (from 1931 to 1951)

Table 1. Total Marital Fertily Rate from age 20, Mean Age at Marriage and Mean age at last Birth

	TMFR 20	Mean age at first marriage	Mean age at last child
1900 - 1919	4.7	24.0	35.1
1920 - 1940	3.5	23.7	32.0
1900 - 1940	4.0	23.8	33.4

Source: population Register of Granarolo

Table 2 - Percentage Distribution of Covariates (based on population at risk)

	%
Socioeconomic Status (SES)	
Sharecropper and Farmer	41.4
Well Off, Artisan and Clerical Collar	15.6
Rural Daily Wager	27.1
Non-Rural Worker and Laborer	11.4
Other Occupation	4.5
Age of Woman	
15-19	1.5
20-29	37.3
30-39	38.6
40-49	22.6
Life Status of Previous Child	0.0
Alive	99.5
Dead	0.5
Marriage Cohort	0.0
1900-1909	20.6
1910-1919	18.6
1920-1929	37.4
1930-1940	23.4
Period	
< 1914 [Ref.]	12.4
1915 – 1918	6.5
1919 – 1926	19.6
1927 – 1939	35.8
≥ 1940	25.6
N Birth Episodes	3,409

Sources: As for Table 1

Table 3.1 - Stratified Cox Model Estimates with interactions between parity and marriage cohorts. Married Women, Granarolo 1900-1940

	Coefficients	S.E.	Hazard ratios	P. Values
Age of Woman				
15-19	-	-	1.000	-
20-29	-0.179	0.08	0.836	0.025
30-39	-0.534	0.091	0.586	0.000
40-49	-1.921	0.164	0.146	0.000
Life Status of Previous Child				
Alive	-	-	1.000	-
Dead	1.41	0.106	4.096	0.000
Socioeconomic Status				
Sharecropper and Farmer	-	-	1.000	-
Well Off, Artisan and Clerical Collar	-0.165	0.052	0.848	0.002
Rural Daily Wager	-0.057	0.044	0.944	0.194
Non-Rural Worker and Laborer	-0.157	0.064	0.855	0.014
Other Occupation	-0.413	0.102	0.662	0.000
Period				
< 1914 [Ref.]	-	-	1.000	-
1915 – 1918	-0.463	0.089	0.629	0.000
1919 – 1926	-0.15	0.091	0.861	0.098
1927 – 1939	-0.471	0.111	0.624	0.000
≥ 1940	-0.722	0.145	0.486	0.000
Marriage Cohort				
1900-1909 [Ref.]	-	-	1.000	-
1910-1919	0.386	0.096	1.471	0.000
1920-1929	0.407	0.119	1.503	0.011
1930-1940	0.702	0.137	2.018	0.000
Parity * Marriage Cohort				
Parity 2 * 1910-1919	0.040	0.117	1.041	0.011
Parity 2 * 1920-1929	-0.024	0.129	0.976	0.000
Parity 2 * 1930-1940	-0.180	0.153	0.835	0.000
Parity 3 * 1910-1919	-0.120	0.134	0.887	0.001
Parity 3 * 1920-1929	-0.376	0.140	0.687	0.000
Parity 3 * 1930-1940	-0.508	0.184	0.602	0.000
Parity 4 * 1910-1919	-0.369	0.151	0.691	0.000
Parity 4 * 1920-1929	-0.474	0.160	0.623	0.000
Parity 4 * 1930-1940	-0.568	0.227	0.567	0.000
Parity ≥ 5 * 1910-1919	-0.366	0.197	0.694	0.001
Parity ≥ 5 * 1920-1929	-0.548	0.200	0.578	0.000
Parity ≥ 5 * 1930-1940	-1.213	0.419	0.297	0.000
N Birth Episodes		3,409		
Log pseudo likelihood		-21462		

Table 3.2 - Stratified Cox Model Estimates with interactions between period and period. Married Women, Granarolo 1900-1940

	Coefficients	S.E.	Hazard ratios	P. Values
Period				
< 1914 [Ref.]	-	-	1.000	
1915 – 1918	0.091	0.149	1.095	0.541
1919 – 1926	0.061	0.113	1.063	0.584
1927 – 1939	0.049	0.125	1.050	0.693
≥ 1940	0.045	0.194	1.046	0.816
Parity * Period				
Parity 2 * 1915 - 1918	-0.540	0.152	0.583	0.001
Parity 2 * 1919 – 1926	-0.093	0.120	0.911	0.189
Parity 2 * 1927 – 1939	-0.606	0.132	0.546	0.001
Parity 2 * ≥ 1940	-0.921	0.178	0.398	0.001
Parity 3 * 1915 – 1918	-1.015	0.192	0.362	0.001
Parity 3 * 1919 – 1926	-0.428	0.136	0.652	0.001
Parity 3 * 1927 – 1939	-1.000	0.154	0.367	0.001
Parity 3 * ≥ 1940	-1.521	0.207	0.218	
Parity 4 * 1915 – 1918	-0.567	0.222	0.567	0.012
Parity 4 * 1919 – 1926	-0.490	0.170	0.670	0.003
Parity 4 * 1927 – 1939	-1.169	0.187	0.311	0.001
Parity 4 * ≥ 1940	-1.438	0.238	0.237	0.001
Parity 5 * 1915 – 1918	-0.501	0.306	0.606	0.082
Parity 5 * 1919 – 1926	-0.573	0.252	0.564	0.017
Parity 5 * 1927 – 1939	-1.082	0.254	0.339	0.001
Parity 5 * ≥ 1940	-2.049	0.369	0.129	0.001
N Birth Episodes		3,409		
Log pseudo likelihood		-21448		

Note: The model also includes the following variables: Age of woman, Life Status of Previous Child, SES, Marriage Cohort.
Source: As for Table 1.

Figure 2.1 – Hazard Ratios for the interactions by Parity and Marriage Cohort. Married Women, Granarolo 1900-1940

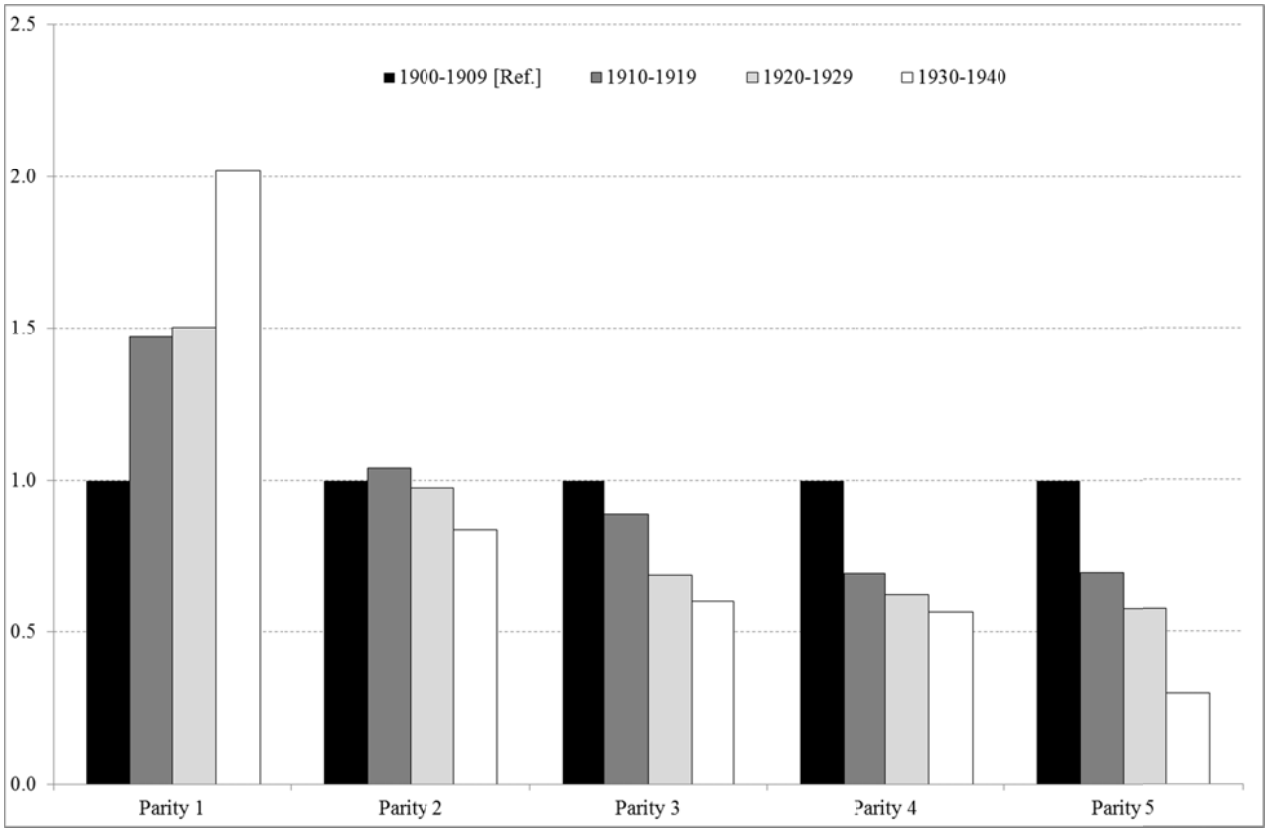
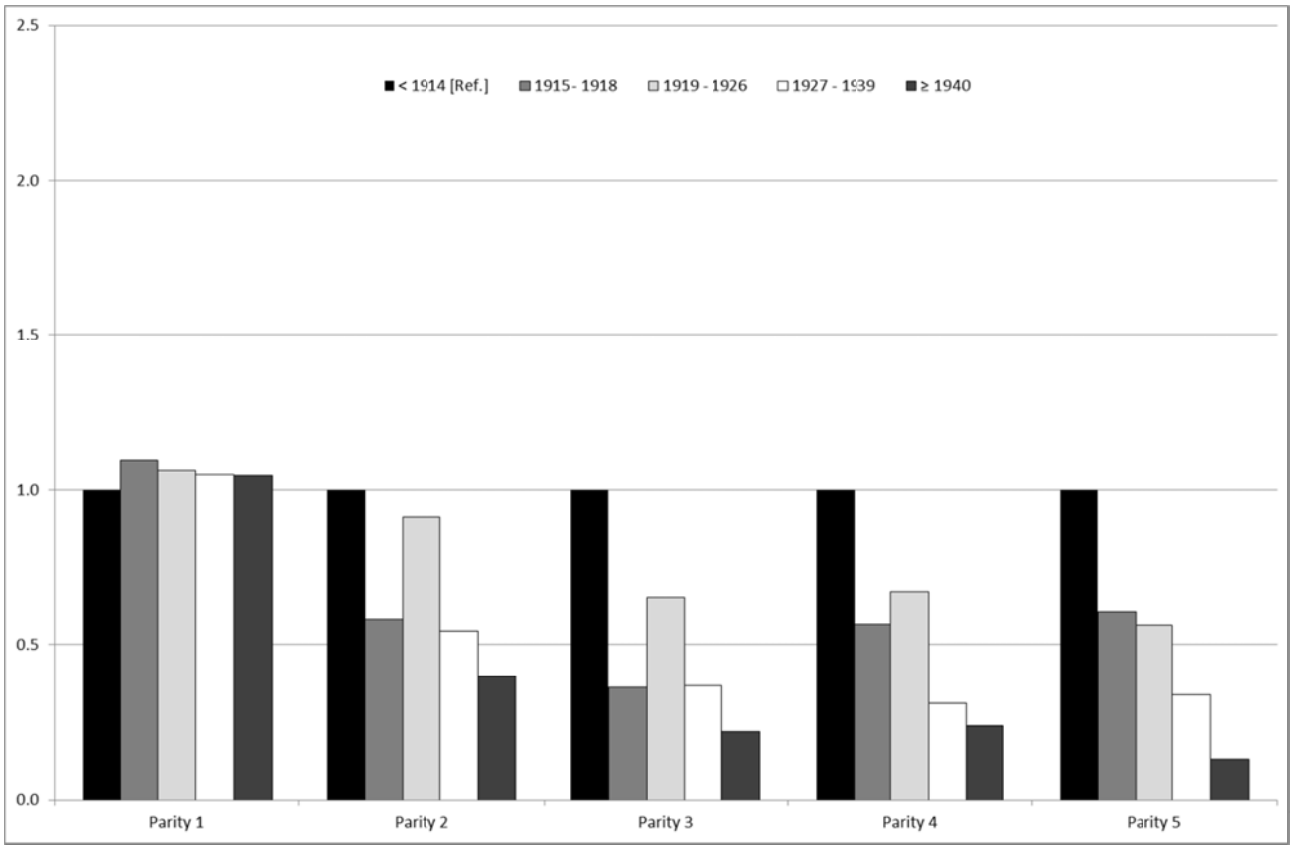


Figure 2.2 – Hazard Ratios for the interactions by Parity and Period. Married Women, Granarolo 1900-1940



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