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Education as a determinant of fertility and the interplay with employment: The Italian case

Prof. Maria Rita Testa

SUPERVISOR

Prof. Silvia Menegazzi

CO-SUPERVISOR

Gaia Catalani

ID 651742

CANDIDATE

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List of Abbreviations

AMEs	Average marginal effects
e.g.	For example – *exempli gratia*
FSSCV	*Famiglie, soggetti sociali e ciclo di vita*
Inapp	National Institute for Public Policy Analysis – *Istituto nazionale per l'analisi delle politiche pubbliche*
Istat	Italian National Institute of Statistics – *Istituto Nazionale di Statistica*
IUD	Intra-uterine device
MEF	Ministry of Economy and Finance – *Ministero dell'Economia e delle Finanze*
MLR	Multinomial logistic regression
MPP	Mean predicted probability
PCA	Principal component analysis
RMSE	Root mean square error
SDT	Second Demographic Transition
STEM	Science, technology, engineering and mathematics
TFR	Total fertility rate

Abstract

The persistent decline in fertility rates represents one of the most pressing demographic challenges of the 21st century, particularly in Western countries such as Italy. Among the variables that could be employed to interpret such fertility decline, education can be identified as having both an explanatory and mediating role. Female education is a key determinant of fertility, shaping women's life choices, career trajectories, and family-building decisions. Educational choices condition the life course of individuals by presenting them with certain occupational opportunities and influencing their fertility intentions and choices. The main purpose of this thesis is to investigate the relationship between education and fertility of Italian women. To do so, the research is divided into three Chapters. First, a general outline of the association between fertility and education is produced according to existing literature. Second, Italy is selected as a case study of the interplay between fertility and education. An overview of the fertility decline within the Italian context is provided, pointing out the peculiarities of the peninsula that intervene in the relationship between fertility and education. Then, an analysis on three different generations of women from the second half of the 20th century based on the data gathered by the 2016 Istat survey "*Famiglie, soggetti sociali e ciclo di vita*" (FSSCV) is presented to assess whether the impact of education on fertility has changed overtime. It is found that education has remained a good predictor of fertility, although contextual factors have changed across generations. Third, by referring to common life course trajectories, education is linked with employment and the interaction between these two variables is considered in terms of fertility outcomes of Italian women born in the second half of the 20th century, whose data is contained in the FSSCV survey. Drawing from the findings of the "Unstable employment careers and (quasi-)completed fertility: evidence from the labor market deregulation in Italy" paper published in 2024 by Alderotti, Guetto, Barbieri, Scherer and Vignoli, a statistical model is applied to explore the relationship between education, employment and fertility. It is found that different educational paths and fields of study may lead to jobs associated with specific occupational conditions that are more or less conducive to childbearing; in particular, such conditions concern among others sex segregation, labor demand and supply, degree of stability. For instance, temporary contracts and employment in male-dominated fields have a negative impact on the fertility outcomes of Italian women; on the contrary, part-time working arrangements are found to be positively related to Italian women's fertility outcomes. More interestingly, women that adopt a mixed approach by combining temporary and part-time employment tend to have a higher number of children, as they increase their economic capacity.

INTRODUCTION

Humanity is experiencing an unprecedented demographic shift: the world's population is aging faster than ever, reshaping economies, healthcare, and society itself, and aging populations are becoming a defining challenge of the 21st century. Today, most of the people projected to be alive in 2050 have already been born. In the next 10 years, the global population aged 80 is projected to outnumber newborns and infants[1]. By 2080, the number of individuals over 65 years of age will exceed the number of children under 18 (United Nations, 2024). These figures are particularly alarming if it is considered that the largest share of the elder world population will be concentrated in those that are considered the Western world, whose population is increasingly aging due to persisting low fertility rates. Among these, Italy represents a unique and alarming case of declining births and population aging.

Today Italians are living longer than ever before. Also, Italy's fertility rates were some of the first to fall below the very low fertility threshold in the 1990s and they have yet to recover significantly. Today, the number of births is still in decline, contributing to worsening population aging issues stemming from, also, higher life expectancy. An increasingly older population has many implications in several regards. This profound demographic transformation first strains the labor market, shrinking the workforce and inflating the dependency ratio. As a result, on one hand the demand for pensions and social security grows, placing more pressure on the labor force, whose age of retirement will shift upwards; on the other, the economy would suffer, with negative consequences for productivity and innovation. Lower numbers of children will then cause the demand for care services to go up, especially with regard to the elderly, who are more likely to be in need of medical assistance and geriatric care. Social structures at both the private and public level will evolve, with smaller and smaller families and a growing number of aged individuals across society as a whole, potentially sparking social tensions. This kind of structural change in the population will then likely cause a shift in politics, with issues typically associated with older individuals will become the main object of the political debate. Finally, social interactions and imitation dynamics will reinforce the tendency to reduce the number of children, feeding into a mechanism that could become a loophole impossible to resolve if not addressed in time. In Italy some of these features have already been observed and governments have long tried to tackle the issue by intervening in the social, economic and demographic dimensions.

[1] Children below 1 year of age.

One way to slow down the aging process would be to raise fertility levels that have been low or at their lowest point for at least forty years. A rise in fertility levels would alleviate the issue of population aging, although the positive outcome would not be visible in the short run and the number of births would need to be consistently higher than the present for a long period of time. Along with this, pushing people to achieve certain fertility levels is incredibly difficult, as pro-natalist policies require action in several regards of both society and the state and balancing many variables. Indeed, despite the numerous attempts of Italian governments to raise the number of births, the country is yet to see a significant and reassuring increase in fertility levels.

Among the intervening variables in the decline of fertility levels across the world, education plays a central role. Indeed, education has an impact on all demographic events: rising educational levels are associated with lower mortality, better health, and different migration patterns (Lutz & Skirbekk, 2013). Additionally, it is widely recognized that better education deeply influences social behavior through knowledge acquisition, shifts in values and offering better opportunities later in life. Among others, family building is one of the several dimensions impacted by such dynamics. Education's impact on fertility has been proved to operate on multiple levels: the duration of education, the field of study and the level attained all contribute to forming individual preferences and shaping attitudes and behaviors. In particular, researchers have observed that educational differentials among women correspond to very different fertility patterns. Higher levels of female education are often associated with delayed childbearing, as women tend to prioritize career development, financial stability, and personal aspirations before starting a family. Better educated women have also easier access to information about reproductive health, contraception, and family planning, leading to more control over reproductive choices and eventually to lower completed fertility. Moreover, educated women tend to have fewer children to invest more in their offspring's well-being, reflecting a shift from quantity to quality in child-rearing. For these reasons, the expansion of female education has been a key factor in declining fertility rates in several countries, including Italy.

However, the magnitude of the negative association between fertility and education has changed over time and some have even stated that the educational gradient has reversed in some countries. In fact, considering the improved and more secure life opportunities presented to the better educated, individuals with higher levels of education may ultimately be able to have a larger number of children. In spite of this, time limits constraints due to the reproductive window and old age often hamper better educated couples' ability to build larger families. More specifically, women that resort to delayed childbearing after completing their education to pursue professional goals have lower chances to achieve their desired family size, despite their attempts at fertility recuperation at older ages. Then, social, economic and policy elements may alleviate or worsen couples' and women's

ability to have children, how many and when to have them. In summary, the interplay between fertility and educational levels is not necessarily straightforward; on the contrary, when all the other variables intervening in the relationship are taken into account, the association between the two must be investigated and demonstrated against the peculiarities of the context in which individuals are immersed.

As Italy has raised curiosity about these mechanisms since the end of the 20th century, when fertility rates were reaching some of the lowest levels ever observed at the time, the country has been the object of several demographic, economic and social studies assessing the influence of education. It has been argued that educational differentials strongly influence fertility intentions and behaviors, depending on the context where individuals are living. In particular, the impact of education over fertility is remarkably visible for Italian women whose educational attainment levels shape their aspirations, condition their life choices in terms of, among others, employment and ultimately determine their fertility outcomes. Several authors have also stressed the relevance of cultural values and traditions which pervade society as a whole, strongly intervening in the relationship between fertility and education. Moreover, a very fragmented history and a peculiar geography make Italy an extremely diversified country, whose population's behaviors are likely to change across macro-areas and even across regions. In short, Italy represents a very unique case of low fertility levels, whose origins are extremely interesting and complex to investigate.

This dissertation intends to expand existing research on the correlation between education and fertility rates in Italy by adopting a generational approach. Looking at three generations of women born in the second half of the 20th century, their fertility behavior is observed vi-à-vis their educational attainment levels and their life choices regarding their professional career. First, by examining women born in three different decades, not only the relationship between education and fertility can be proved to have persisted or weakened, but it can also be assessed against the changing social, economic and policy context. Second, by taking into account a large sample of women, it is possible to quantify the effect of their occupational status and decisions on fertility outcomes, controlling for their educational level and other background variables. To conduct this analysis, this work is structured as follows. The first Chapter examines the various dimensions of the intricate connection between fertility and education. After a historical introduction to the issue of fertility decline in Europe, the fall in the number of births is interpreted through the several theoretical explanations advanced by scholars to explain the role played of education. Moreover, the significance of educational gradients is analyzed, first, at different parities and, second, in different contextual frameworks. Depending on the political, social, economic features of the context taken into consideration, educational levels influence women's fertility intentions and behavior, affecting overall fertility rates. The second Chapter

presents Italy's case of fertility decline and interaction between educational gradients and number of births. The environmental and contextual frameworks provide the basis for the analysis of the relationship between education and fertility in the Italian peninsula, which represents a unique case among Western countries because of exceptionally low fertility levels and the peculiar characteristics of society. The Chapter ends with a generational analysis of how educational differentials on fertility have changed throughout the last few decades for a sample of Italian women extracted from the 2016 Istat survey "*Famiglie, soggetti sociali e ciclo di vita*" (FSSCV). The third Chapter includes a study conducted on a large sample of women whose data was collected by the same survey; their fertility behavior is observed based on their educational and occupational careers to demonstrate that certain working conditions are more or less conducive to childbearing in the Italian case. In particular, it is argued that gender-typical educational paths and sex segregation in both the education system and the labor market determine women's professional career. Then, depending on the sector, the type of contract and the number of working hours, their employment status affects their stability and security and determines their ability to have a certain number of children. Finally, the Conclusion section summarizes the arguments made throughout the dissertation.

1. THE ASSOCIATION BETWEEN EDUCATION AND FERTILITY

Education can be identified as the cultural transmission of knowledge accumulated during history. It is intended to supply information and instruments through which individuals can perceive the world and navigate difficulties. The purposes of educating are enhancing cognitive capacities, molding values and behaviors, and informing on the alternative ways of life. Hence, education is empowering, as it offers the capability to make conscious and propitious decisions. According to Lutz and Samir (2011), education "enhances access to information, changes the motivations for behavior, and empowers people to better pursue their own preferences". In other words, education is an extremely strong cause of social change.

Education is also a source of heterogeneity (Lutz & Skirbekk, 2013). Educational differentials produce a more diverse population by teaching skills and informing choices. Thus, education shapes individual behaviors, values and attitudes, whose outcome varies according to the educational gradient. Among the domains influenced by education, demographic events have been largely molded by educational differentials. Rates of mortality, fertility and migration, along with others, have fluctuated according to educational levels in populations around the globe. In particular, fertility outcomes vis-à-vis education have attracted the attention of scholars and researchers in view of the low fertility levels in developed countries and their implications. In an effort to address these issues, educational differentials may be useful to predict fertility outcomes.

Cleland (2009) expands on the above stating that demographic and fertility behaviors can be largely forecasted by considering the levels of education of adults, which he considers the strongest factor influencing future fertility. In countries where high education is accessed by large portions of the population, fertility related choices like partnership and union formation, fertility timing and birth intervals, and number of children are strictly connected to both educational enrolment and attainment (Sobotka et al., 2017). The education-fertility association is contingent to both individual and contextual factors. From the viewpoint of the individual, life experiences and psychological factors may alter the perception of parenthood and condition the fertility choices of a couple. At the aggregate level, several external forces play a role in shaping individual fertility behavior, including the social context and smaller networks. Both dimensions interact with each other in affecting fertility behaviors, ultimately combined in a complex mechanism influencing individual choices, attitudes and aspirations.

Therefore, education represents a crucial variable intervening in the variations of fertility levels and must be considered when managing low fertility rates. In particular, very low fertility levels will translate into a shrunk working population in the future. If the shrinking working age population issue

is not addressed in time, societies will face steady deterioration of their well-being and of their political and economic power. As education affects fertility behaviors, taking educational gradients and related fertility implications into account can prove advantageous in several domains.

The magnitude of educational differentials vis-à-vis fertility might change according to the stage of the fertility transition a country is currently in. In developed countries, where fertility is increasingly lower, the educational differentials tend to be smaller (Cleland, 2009). In other words, the behaviors of individuals from all educational levels gradually converge as the transition advances. In other cases, educational gradients might remain significant even after the end of the transition (Bongaarts, 2003). One outcome or the other emerges according to several variables, including the contextual environment where the analysis of fertility levels is conducted. What is apparent is that, during the transition, the relevance of educational differentials persists in terms of fertility; therefore, the broader and long-lasting implications of educational and fertility changes on other domains will likely linger to the post-transitional stages.

This Chapter analyzes the different dimensions of the complex relationship between education and fertility. The discussion mostly focuses on higher education and the critical repercussions of its expansion. The first section briefly describes the unfolding of the fertility decline in developed countries, with a focus on Europe (Section 1.1). More specifically, this section presents the issue of low fertility with relation to family building postponement and childlessness and why the decline in births must be addressed by taking into account the educational differentials. The second section introduces the main theoretical interpretations of the relationship between education and fertility, and through which mechanisms the former contributes to the fall in births and weaker childrearing-related attitudes (Section 1.2). Then, the third section presents the consequences of educational enrolment and attainment on intended and actual fertility, making a distinction between first and higher parities (Section 1.3). The fourth section links the effects of education on fertility to the social, cultural, political and economic environment and how they affect the association (Section 1.4). Finally, the fifth section provides a summary of the Chapter (Section 1.5).

1.1. The fertility decline in developed countries

The key goal of this section is to describe the fall in fertility that occurred in developed countries in the last decades. In particular, the changes brought by the Second Demographic Transition (Section 1.1.1) and the role of fertility postponement and childlessness (Section 1.1.2) are presented in view of the consequences of low fertility (Section 1.1.3). Finally, the decline of fertility is coupled with

education and justifications are provided for the relevance of the latter when discussing low fertility (Section 1.1.4).

1.1.1. The transition to low fertility, delayed family formation and childlessness

From the 1970s onwards, Europe underwent a shift from collective to individualistic values which, along with a process of secularization, provided the basis for a change in attitudes towards childbearing and, in particular, motherhood for women (van de Kaa, 1987; Lesthaeghe, 2010). This wave of social change included the emancipation of women and their newly emerged opportunity to participate in society in different ways than those traditionally accepted. The rising levels of female education and their entry into the job market contributed to reinforcing these mechanisms of change. In response to these changing dynamics, the Second Demographic Transition (SDT) theory was presented by van de Kaa and Lesthaeghe, who intended to explain the stage of fertility decline within the wider demographic transition (van de Kaa, 2002).[2]

The commonly shared traditional values and norms began to weaken and left the place for individualism. Encouraged by crucial changes in the perception of their social role, women began prioritizing their actualization in the workplace before the family. Achieving their career goals entailed delaying other life events like union formation and family building, which used to be experienced earlier. Entry into motherhood was progressively postponed as far as leading to the necessity to adjust fertility intentions towards smaller or even childless families. In other words, the SDT attributes the fall of fertility to the change in values and attitudes towards female emancipation, motherhood and childbearing (Lesthaeghe, 2014).

Apart from the individual, the shift in values affected also other social entities. The traditional family, characterized by marriage and wedlock births, became increasingly less common, as practices like divorce and out-of-wedlock births were spreading across social groups. Parenthood was spreading among unmarried, who were more commonly cohabiting with their partners pre-marriage, and single women. From this perspective, marriage had ceased to be the precondition for economic stability and childbearing, but had acquired a less materialistic character, as individuals now married for love and children were considered added value to the family (van de Kaa, 2002). Very high parity births, namely above three or four, became rare, while more and more women remained childless. As a result, fertility rates plummeted and below replacement levels became the norm.

Therefore, the decline in fertility has been partly caused by delayed family formation.[3] Several explanations can illustrate this causality. First, biological constraints inhibit women from having

[2] The unfolding of the Second Demographic Transition (SDT) is discussed in Section 1.2.3 of this chapter.
[3] The timing of fertility is identified as “tempo”, while delaying motherhood at later ages is defined as the “tempo effect”.

children outside of their fertility window (Mills et al., 2011). Also, fecundity decreases with age within the fertile window.[4] The constant postponement of fertility may thus culminate in involuntary childlessness and even infertility. Second, women face negative social perceptions with regards to their age and the commonly accepted timing of childbearing (Billari et al., 2011). As a consequence, they are increasingly unlikely to have children as they age. Further, fertility postponement is often due to constraints that individuals, women especially, face when preconditions for family formation would allow entry into parenthood. These constraints, often of social and economic character or related to the workplace, may not loosen overtime, impeding the transition to fertility. Or else, other unforeseen barriers may emerge and hinder fertility later in life. Ultimately, the number of births sinks and fertility rates drop to low or even very low levels.[5]

1.1.2. The consequences of low fertility and *how to deal with it*

Low fertility has gained extensive attention in the last decades. Several scholars have conducted studies and analyzed the ramifications of low fertility levels in multiple regions of the world, testing for the weight of factors of different nature at play in the fertility decline. First, low-fertility countries have diminishing numbers of women of reproductive age.[6] As a consequence, there will be fewer births and the age structure of the population will shrink at the base. With fewer children born, the number of future mothers will fall as well, in a reiterating loop of declining birth rates.

From a demographic perspective, small numbers of births produce changes in the age of the total population that on average becomes older. An older population results in an aging workforce population, whose productivity decreases, and in more elderly people, who are not fit to work and are usually sustained by the workforce through state welfare. In other words, declining fertility leads to substantial population aging and a rising dependency burden.

Fewer births would also cause a shift in the ideal family size norm due to socialization effects of increasingly smaller families. In fact, fertility intentions are first matured during childhood and youth through socialization. During these stages, the environment heavily influences the individual and molds the attitudes towards childbearing and legitimizes fertility intentions as future intended family size. An environment with fewer children would socialize women into having fewer children themselves. Moreover, as children often take their parents as an example for their future decisions, a

[4] Fecundity refers to the human reproductive capacity. In both women and men, ability to reproduce is strictly related to the age of the individual, in fact humans can only be fertile over a certain number of years.

[5] The term “lowest-low” or “ultra-low” fertility first appeared in Day (1988) with regards to population aging. The concept has since then been resumed and discussed by Lutz and colleagues in the first years of the new millennium (Lutz et al., 2006). In this dissertation, lowest-low fertility is introduced in the next section (Section 1.1.2).

[6] Low fertility in previous generations results in less women born and less potential mothers at present.

family with less children will result in children with smaller family preference and lower achieved fertility (Lutz, 2006).

Thus, low fertility ages the workforce and society, that in turn are less able to generate economic growth. While incomes decline, the aspirations of new generations continue to rise, disregarding their diminishing purchasing power. As aspirations and fertility intentions are strictly related to economic resources, lower incomes would induce fertility to decline even more. In an effort to secure a better salary, individuals would then resort to higher educational attainment to increase their human capital and their chance at higher-paid occupations. However, in an environment where most of the population has a higher education, access to well-paying jobs would become extremely competitive and a degree would not guarantee employment or economic security.

These mechanisms had been predicted to halt once replacement levels were reached, when fertility would have stabilized.[7] However, fertility has since continued to decline and has reached even lower levels which have now been in place for decades. The concept of "lowest low fertility" was formulated to explain the persistence of this phenomenon in European countries, as well as others across the world (Lutz et al., 2006). The low-fertility trap hypothesis asserts that fertility rates way below the replacement level might not rise again because of mechanisms that replicate the conditions that first caused fertility to fall to very low levels. Consequently, society is caught in a "trap" where it becomes extremely difficult to halt the reiterating mechanisms and raise the number of births above ultra-low levels (Lutz et al., 2006).

1.1.3. Why taking education into account is crucial when addressing fertility concerns

The strong association between levels of education and number of births has been widely proven by scholars. In terms of population projections, Lutz and Samir (2011) were able to foresee that female educational variability could result in a one-billion difference in population growth by 2050. As it is such a major and precise indicator of present and future fertility, education's effect on demographic behavior cannot be overlooked or underestimated. In fact, education shapes societies in several ways, most of which can have direct or indirect implications on fertility.

From an individual standpoint, education entails several benefits. First, well-educated individuals often have access to more opportunities, socially and economically. On average, they have higher salaries and encounter less difficulties in both their personal and public life.[8] Second, education can be considered an indicator of women's status. It plays a crucial part in the role women take in society

[7] This argument had been presented by the demographic transition theory.

[8] The former depends on their human capital. The higher the level of education, the higher the human capital, the more likely an individual is to find a well-paying job. The latter is mostly due to their better problem-solving skills and their wide knowledge, both acquired through education (Section 1.3.1).

and the family, as well as vis-à-vis men. In environments where women are less educated, they have less opportunities and contribute less to society, in terms of social, political and economic value. An educated female population, instead, contributes to overall productivity and makes informed fertility decisions that, in gender-egalitarian states where women are not disadvantaged compared to men, might raise the number of births.

Beyond individual benefits, changes in education have broader social and economic implications. In addition to increasing personal income, improved education is a prerequisite for sustained economic growth (Lutz et al., 2008). Through an improvement in human capital, individuals acquire knowledge and skills that later have a great impact on the economy. First, they are more effective workers; second, they are more able to exploit the opportunities presented by the market (Nelson & Phelps, 1966). In short, a more educated working population can inflate economic growth.

At policy level, education can be employed to improve labor and productivity. Population aging due to low fertility, which has numerous alarming and long-lasting effects on society as a whole, severely impacts productivity rates and economic growth. Lower productivity decreases investment and slows economic growth, leading to a poorer population. The negative effects of population aging could be partly targeted through interventions on the levels of education. Increasing education levels and larger female labor force participation would slow down population aging. Additionally, dependency ratios would stop growing at an alarming rate. As a result, productivity would increase and several economic concerns would be addressed.

Most of the population projected to be alive in 25 years has already been born and the portion of the population that will be of working age will have further shrunk. Considering these dynamics, it is necessary that developed countries at more advanced stages in the process of demographic aging act to improve productivity at all ages. Strategies to address population aging in response to low fertility could propose to "design more opportunities for lifelong learning and re-training, support multigenerational workforces and create opportunities to extend working lives for those who can and want to continue working" (United Nations, 2024).

These mechanisms must be considered if policymakers want to successfully target low fertility and other related issues, as change is necessary to avoid a potential collapse of the economy. The decline of economic power would also curtail the opportunities of a country both in political and economic terms, as it might find itself isolated from its allies that no longer benefit from bilateral relations and mutual exchanges. In other words, population growth and structure concerns are extremely relevant at state level in demographic, economic and political terms.

In conclusion, as Lutz and Samir stated, the "global population outlook depends greatly on further progress in education, particularly of young women" (Lutz & Samir, 2011). Given that the structure

and characteristics of the population greatly impact several realms of society and the state, it becomes imperative for policymakers to address the fertility concerns of countries by considering the implications of female education.

1.2. Education as a determinant of fertility: main interpretations

Over the years, the relationship between education and fertility has stirred curiosity among the research community and an increased number of studies have been conducted on the topic. Scholars have developed several interpretations to explain the complex link between education levels and fertility attitudes and behaviors. The theories describing this link focus on selected dimensions through which education molds intentions and achieved fertility. The motives behind these fertility behaviors have been found in both micro and macro factors of social, cultural, economic, political nature.

This section attempts to provide an overview of the theoretical explanations of the association between education and fertility levels. A brief analysis of the initial expansion of female education (Section 1.2.1) is followed by microeconomic arguments (Section 1.2.2), social and cultural developments (Section 1.2.3) and other theoretical assertions, ranging from socialization to intergenerational ties (Section 1.2.4).

1.2.1. The expansion of female education

A historical analysis of fertility differentials by education conducted by Skirbekk (2008) has attempted to delineate fertility trends across recent history. In the pre-transition stages of the demographic transition, he observed a positive association between fertility and education, as higher levels of education corresponded to higher social status, enabling women to achieve higher fertility.[9] During the 20th century, governments introduced compulsory educational policies and larger shares of the population gained access to education. Simultaneously, expanding education became a worth studying indicator of societal change. Since researchers started measuring the association between female education and fertility, they have observed a negative relationship linking the two variables (Skirbekk, 2008; Lutz & Skirbekk, 2013). In fact, rising education has been identified as the leading cause of the fertility decline during the demographic transition (Cleland, 2009).

[9] Higher social status is strictly linked with higher economic and health status, too. Better health allowed women to carry more children, while financial assets meant the availability of services and commodities that could boost fertility levels. For example, Lutz and Skirbekk (2013) mention the possibility to employ nannies, who could support the mother and look after her older children.

Accordingly, several studies give female education a very large role in the decline of fertility in Europe. In this region, the fall in fertility was mostly caused by the postponement of marriage and births. This delay in fertility was most present among women with higher levels of education, who had high levels of investment in human capital. The highest the investment, the latest the entry into motherhood, which translated in university-educated women being the first to postpone childbearing. Delaying childbirth meant a higher chance of securing well-paid employment and thus higher economic autonomy (Caltabiano et al., 2009). In short, educational expansion can be considered the primary cause of delayed family formation (Mills et al., 2011).

The expansion of education gave women the chance to experience life differently than what was suggested by the traditional role of women in society. Until a more inclusive access to education was made available, women had been dependent on the male breadwinner model, according to which the man was in charge of sustaining the family. As women were segregated in the household and the primary caregiver of the family, they were not allowed or needed to earn a salary.[10] With the expansion of education, new opportunities began to be presented to women, including the possibility to enter the labor market and earn an income that would sustain themselves without the support of a male partner. Women's entrance in the labor force, then, further contributed to the decline of fertility as having a job represented an alternate means of financial support and social identity, which would lessen women's reliance on men and children (Dixon-Mueller, 1993).

Education also increased knowledge and awareness about modern methods of family planning and incentivized their use. In the context of fertility decline, contraceptive use has contributed to a large portion of the decline, as the spread of modern contraception has enabled women to minimize unforeseen pregnancies, delay childbearing and pick their family size. Among women, the higher educated benefitted from the spread of modern contraception first (Bongaarts, 2010). More recently, the ties between education and contraceptive use are still apparent. As education is positively linked to demand for and use of contraception, well educated women have better knowledge and access to contraceptive methods, and thus use them more effectively (Bonghaarts, 2010). Lower levels of education are, instead, correlated with less awareness of an action's effects and less self-regulation, which result in lower usage and less efficacy of contraception (Sobotka, 2004). The "contraceptive revolution" gave women the power to minimize unintended pregnancies, and it gave well educated women the possibility to postpone childbearing until their human capital investment had been fructuous enough.

[10] With the advent of industrialization, European families began to be built on a male-breadwinner and female-caregiver paradigm. This model foresees an earner and a non-earner, each assigned to a sphere: the former to the public, namely society, the latter to the private, or the family. Accordingly, the man earned the money to provide for the family, while women had the responsibility of rearing children, assisting elders and administering the household.

More recently, women have gained access to higher education reinforcing the phenomena of female emancipation and independency from men and strictly family-related roles. The highest investment in human capital deriving from higher educational levels is more likely to culminate in better career opportunities, higher salaries and improved independence. In short, higher education is allowing women to increasingly rely on themselves and invest in their own path, which does not necessarily coincide with becoming a mother. This is now widely considered the most relevant aspect of education vis-à-vis fertility for several reasons. The following Sections dive deeper into this perspective.

1.2.2. Microeconomic theory

A couple with a high level of educational attainment is more likely to be economically better off than less educated people during their life. Higher levels of education increase an individual's chances of getting more secure and higher paying jobs. These conditions would hypothetically allow highly educated couples to have more children than their lower educated counterparts, as their high salaries can more easily cover the direct costs of raising children. Thus, more resources and security should both contribute to the possibility of having larger families for highly educated people.

Nonetheless, other micro-economic dynamics offset the positive income effect on fertility. According to this perspective, having children becomes a source of fulfilment for couples in modern times. As the family is not faced with the necessity to have higher numbers of children as a source of income, parents begin perceiving children as a source of personal fulfilment, instead. Their children's well-being is also a reason for the parents' satisfaction. It follows that parents experience a "quality-quantity trade off" between the choice to have more children (quantity) or to raise less children in better conditions (quality) (Becker, 1960). This has led, for example, to the alignment of family sizes disregarding educational differences.[11]

Moreover, most European countries experienced a fertility decline in the last decades of the 20th century despite the expansion of education. The positive income effect derived from high educational attainment was not sufficient for families to increase their fertility behaviors because of the raising indirect costs of childbearing. Higher levels of education usually result in higher earning capacity, in turn raising the opportunity cost of childbearing, as explained by the neoclassical economic perspective. In addition, a better educated woman is more likely to participate in the workforce and, thus, faces even higher opportunity costs of having children (Becker, 1974). While traditionally women bear the responsibility for raising children and taking care of the family, in the case of a

[11] Van Bavel and colleagues (2018) observed that, even before the advent of modern contraception, cross-country 1901-1945 cohorts from all educational levels converged towards the two-child family. They attributed this phenomenon to the quality-quantity trade off.

working woman these have to be reconciled with her occupation. Therefore, when making a fertility choice, a woman weighs the prospect of having a child against the necessity to take time off of work in favor of childrearing and the lost income (substitution effect). In a context where women have found their own place in society outside of the family home, it becomes even harder to reconcile both roles, which often results in foregoing children.

More recently, the uncomfortable decision between employment and becoming parents has become extremely challenging due to the raising economic insecurity and financial instability. Recessions negatively affect fertility, as the economic crisis might erose the resources available to a couple. Especially the youth is left worse off compared to previous generations. These effects are stronger on less educated individuals, who experience a pattern of disadvantage where their family transition is earlier and less stable (Sobotka, 2017). Moreover, the volatility of the job market pushes more women to postpone or even forego the possibility to have children, in order to preserve their occupation in the workforce.

On the other hand, higher educational levels might not always hinder fertility. First, the possibility to be employed in better-paid occupations allows women that postpone fertility to accumulate enough resources for a potential birth in the future. In fact, they might feel more economically secure and decide to have their first birth at an older age. Second, highly educated women are more likely to marry or initiate family formation with a partner with similar characteristics. It follows, the resources of both partners combined might encourage childbearing, vis-à-vis a lower educated and less fortunate couple.

The microeconomic analysis of fertility decline, however, has its shortcomings. The scholars adhering to this approach typically focus on the economic determinants of fertility change, disregarding the institutional, social and cultural factors that shape and differentiate societies, as well as individuals' behaviors. In so doing, non-economic dynamics are overlooked, although they are critical to explain the fall in fertility.

1.2.3. The Second Demographic Transition

The theoretical gap within analysis of the fertility decline concerning factors other than the economy was filled in the 1980s, when van de Kaa and Lesthaeghe formulated the SDT. The theory was developed in response to a shift in goals and values caused by a broader trend of secularization spreading in the 1970s across Europe. The decline of religious authority and the possibility to pursue alternative life-course opportunities strongly changed society as a whole and impacted demographic behaviors of single individuals. According to Inglehart (2007), societies entered a post-materialist phase of the demographic transition, where higher-order needs became the priority of highly educated

individuals. In this phase, known as SDT, self-actualization and greater individual freedom were now pursued in place of materialist objectives (Lesthaeghe, 2014).

This post-materialist individualistic perspective of life heavily influenced the educational differentials in terms of fertility choices. Higher educational levels for women meant preferring self-fulfillment and self-actualization through their own achievement outside the family over adopting the role of caregiver within the household. Due to competing goals and interests, they were considered more likely to have smaller families than their less educated counterparts (Lesthaeghe, 2010).

These dynamics were reinforced by the gender revolution unfolding in those years. In fact, the expansion of opportunities for women outside family life was accompanied by changing gender norms. In those years, women's emancipation contributed to the shift in attitudes towards the role of women in the public, besides the private sphere. The gender revolution, along with more accessible education, spread egalitarian attitudes, which began to counter gender inequalities and sustained the change in gender norms (Goldscheider et al., 2015).

Therefore, Lesthaeghe and van de Kaa's demographic transition theory predicts that, as education levels increase, a change in values occurs, shifting women's preference away from family and children. They now strive for self-fulfillment and independence, which are incompatible with childbearing. The conflict between self-actualization and family formation is most intensely felt by higher educated women (Lutz, 2017). Hence, the spread of new ideas and values stimulated by educational expansion may cause a decline in fertility, especially among well-educated women.

The expansion of women's choices and change in attitudes towards the family and their role as caregivers is strictly related to female enrolment in tertiary education as well as women's entry in the labor market. Higher education and liberal attitudes have helped women to question traditional gender norms and roles in relation to the household and the family. Hence their willingness to become part of the workforce and have a self-fulfilling career, through which they can achieve their newly discovered life goals of self-actualization (McDonald 2000; 2006). In other words, fertility behaviors like birth postponement are strictly related to the shift in values originating from the SDT and the expansion of education.

The SDT also recognizes how education can indirectly affect fertility behaviors. According to the post-materialist argument, highly educated individuals tend to seek higher social status. Status-seeking corroborates the argument that higher educational levels correspond to prioritizing career and personal objectives before entering a new life phase, like parenthood. Highly educated individuals seeking to improve their status often postpone family-building until they meet certain prerequisites (Oppenheimer, 1988; Rindfuss et al. 1980). These may range from self-actualization in the workplace to economic and partner stability. Additionally, status-seeking may result in assortative partnering,

where an individual looks for a partner with equal or higher educational attainment. These preferences may further delay entry into parenthood, for example through a "marriage squeeze", when there is lack of suitable partners. in the case of women that find it harder to find a highly educated partner, they suffer an education-specific mating squeeze (Van Bavel, 2012). What is more, status-seeking might translate in a smaller number of children, as parents may want to preserve their own and their children's status according to the quality-quantity trade off. Therefore, education might indirectly lead to fertility postponement as in the case of status-seeking highly educated individuals.

Despite the undeniable weight that cultural and social changes have had in shaping and encouraging the decline of fertility, the SDT has been criticized for the theory's inability to justify certain empirical evidence in contradiction with its main arguments. In particular, the dissonance between the theoretical assumptions of the SDT with the regional variation observed in Europe vis-à-vis the levels of fertility has called into question the theory's pertinence (Coleman, 2004).

1.2.4. Other theoretical frameworks: diffusionist, socialization and life course theories

Apart from economic and cultural perspectives, the association between fertility and education has been the object of study of several other theoretical frameworks. Among these, several theories focus on the social nature of the mechanisms underlying educational differentials in fertility. The diffusionist perspective, for example, argues that education functions as a catalyst for modernization. Education allows the circulation of ideas and values that often bring about further change in the perception of fertility. Accordingly, educated women are the forerunners of the fertility transition towards smaller families. At the aggregate level, education could later "spill-over" to lower educated women, spreading fertility attitudes and behaviors previously adopted only by the well-educated (Bongaarts, 2003). At first, the emerging attitudes and values circulate among individuals, then diffusion spreads across space leading to a general change.[12] This process of behavioral innovation spreads among people and places through social interactions, namely through the social influence of direct contact, communication and social media, and institutional practices and innovations (Vitali & Billari, 2017).

The socialization argument focuses, instead, on how individual attitudes are influenced by the social context in which an individual is immersed. Values and attitudes are formed first through observation and imitation of the most proximate individuals. Childhood experiences have a great impact, as the family is the earliest agent of socialization to which an individual is exposed. In fact, children tend to reenact their parents' living arrangements and fertility behaviors during adulthood (Anderton et al.,

[12] Bongaarts (2003) describes this phenomenon in his leader-follower fertility model. Educational differentials gradually diminish as fertility attitudes spread in time from the more to the less educated. The ultimate result is the convergence in fertility behaviors across different levels of education.

1987). The educational system functions as a second agent of socialization, which contributes to consolidating or reformulating fertility attitudes. Individuals with more education are more likely to be exposed to a nontraditional ideology relating to family and gender roles (Cunningham et al., 2005). As a consequence, well-educated women may be less inclined to give up their autonomy and career to pursue family formation. On the other hand, educated women that grew up with a working mother may be more convinced that reconciliation of work-family conflicts is possible (Testa et al., 2016).

Further, according to the life course perspective, an individual's life course is characterized by several stages and periods of transition between them. The transition from one stage to another usually requires making a choice, which although related to one particular stage can influence future life transitions (Elder, 1994). This is due to the necessary concatenation between life events and the interconnection of life domains, such as education, work and family (Elder, 1992). Therefore, individuals plan according to their goals and their choices are driven by the desire to fulfill their aspirations. The context in which individuals are embedded strongly influences individual choices, whereas preferences, personal perceptions of the future and goals guide present decision-making (Elder, 1992; Huinink & Kohli, 2014).

With regards to fertility, individuals form family-related preferences and intentions throughout their different life stages. Attitudes towards family related issues constantly change as individuals go through life stage transitions. Individuals evaluate the new experiences and social roles and reformulate their preferences accordingly (Toulemon, 1996). Fertility choices depend on previous life transitions, such as the transition to adulthood, and on fertility aspirations, which may in turn influence transitions preceding the transition to parenthood, like acquiring education and the entry into the labor market. Then, within the life course framework, fertility is strongly linked with education and employment.

For women, acquiring education may indicate predisposition towards a career vis-à-vis family formation. Because the entry into motherhood is forcibly delayed by educational enrolment, it must be presumed that educated women prioritize an investment in human capital over family building. Later, in the transition from education to the next stage, well educated women often prefer exploiting their higher human capital on the job market, where they can pursue independence and personal fulfillment through their career. Moreover, entering the labor force has a liberalizing impact on young women's gender role attitudes (Fan & Marini, 2000). Consequently, the life course perspective identifies an adverse relationship between fertility and female education, characterized by delaying the transitions to union formation and childbearing for higher educated women, which may ultimately result in lower fertility.

1.3. Education's impact on fertility: intentions, timing and quantum fertility

Education can both directly and indirectly influence fertility. The direct effects of education on fertility are usually identified in the extremely difficult reconciliation of the role of student and mother for women. Later, the opportunities presented to a well-educated woman, which conflict with childbearing, represent the indirect effects of education on fertility. Thus, the level of education greatly impacts fertility behaviors though two dimensions: role conflicts and opportunity costs.

Scholars have, thus, differentiated between educational enrolment and attainment. Apart from the short-term effects highlighted above, both dimensions have long-lasting consequences that shape fertility choices and behaviors. It follows, education affects fertility intentions, timing and intervals between births, and quantum fertility.[13] Depending on the circumstances, the long-term effects might have negative or positive implications for fertility.

This section attempts to summarize the consequences of receiving and achieving a certain level of education, on both intended and achieved fertility of women. First, the preconditions for family formation, such as partnership building, and the significance of fertility intentions are discussed with regards to education (Section 1.3.1). Then, the effects of enrolment and attainment are examined in view of first birth (Section 1.3.2) and higher order births (Section 1.3.3).

1.3.1. Partnership and fertility intentions

The level of education influences fertility as early as the first stages of union formation. The preconditions for family building usually include the presence of a partner. Highly educated women are more particular about their partner, but the longer search might result in more stable unions. This has been proved to be partly due to the status-seeking attitude common to higher educated individuals. In fact, higher educated women are more likely to pair with partners that are more educated and, in turn, experience less strain (Hogendoorn et al., 2022). As a result, higher educated couples face less struggles in their marriages and, thus, are often more stable and durable.

However, growing numbers of highly educated women have consequences on partnership formation and eventually on fertility. As women gain access to high education, their chances of marrying may diminish given the presumed preference for relationships in which husbands have higher status than their wives. And when highly educated women do form relationships in which they have higher socio-economic status, their relationships may suffer. Even in countries where mate preference has shifted towards gender symmetry, aversion to relationships where the woman holds dominant status has not disappeared (Van Bavel et al., 2018).

[13] Quantum refers to the number of children had by a woman during the reproductive years.

Nonetheless, education has become positively associated with union formation for European women. The rise of marriages according to educational gradients can now be mostly explained by continuously rising egalitarianism. The spreading of egalitarian gender norms, in fact, encourages women to form partnerships and families, since they find partners who are increasingly willing to share the burden of being a caregiver in charge of the household. In European countries where egalitarianism is low, like southern Europe, recent marriage rates are still lower for women with advanced degrees rather than the less educated (Van Bavel et al., 2018). Furthermore, higher education often contributes to the development of better problem-solving skills, which in turn are likely to favor more stable relationships.

Apart from partnership formation, the level of education can alter the fertility intentions of a couple, either influencing the timing of births and the intervals between them, or how many children the couple may want to have. First, fertility decision-making is influenced by educational levels through contraception. Higher educated women have notably better access to contraceptives and use it more frequently, resulting in negative educational gradients. Second, fertility intentions depend on economic conditions. Higher educational attainment usually results in higher salaries and thus the possibility of raising a higher number of children. In fact, despite the competing attitudes and goals argument, highly educated women do not desire less children than women with lower education levels, in opposition to what is suggested by the quality-quantity trade-off (Testa, 2014).[14] Instead, several countries record a positive educational gradient in intended family size for women, as they are more likely to have a better educated partner that also has more resources to raise an additional child (Testa, 2014). Moreover, higher education allows women to better plan and organize their life according to their intentions, which may ultimately result in a higher capability to achieve their fertility goals compared to lower educated women (Lutz, 2017).

However, a woman's fertility intentions are not always met at the end of her reproductive window. In fact, achieved fertility is usually negatively linked with education, unlike fertility intentions. In the case of highly educated women, there is often a "fertility gap" between fertility intentions and actual number of births, as the ultimate result of fertility postponement (Testa, 2012). Due to the shortened window to have children while they are fertile, they may not achieve their initial fertility intentions. For example, higher educated women in two-child family size norm countries may struggle to have a second birth because of a previous fertility postponement (Testa and Stephany, 2017). Or, women may adjust their fertility intentions based on their satisfaction with the family they currently have. In

[14] Well-educated women seem to be subject to the quality-quantity trade-off when adjusting their fertility intentions. Namely, although they may have more resources than lower educated women, they decide to have less children in order to offer more (quality) to lower numbers of children (quantity). The argument made by Testa (2014) contradicts such micro-economic assumption, at least in terms of intentions.

some cases, they may forego an additional birth by lowering their actual fertility compared to their original intentions. In others, they may find it more fulfilling to have an additional child, thus resizing upwards their fertility intentions.

1.3.2. Fertility behavior: first birth

From the point of view of actual fertility, education might both hinder or encourage the postponement of childbearing, as well as having a first child or having additional children. For one, it is widely acknowledged that educational enrollment is not compatible with childbearing. Especially in the case of full enrolment, at all levels of education women do not engage in family-building due to time limitations and role incompatibility (Blossfeld and Huinink, 1991). In most cases individuals enrolled in education live in the parental home or reside in a shared living arrangement. Both circumstances of residential dependence inhibit the entry into parenthood and even partnership formation. In fact, enrolment can indirectly affect fertility behaviors by delaying not only the entry into parenthood, but also other life events that normally occur before individuals initiate family-building. According to a "sequencing effect", enrolment often postpones financial autonomy, entry into the job market, house purchase, and more, besides partnership and family formation (Neels et al., 2017).

In the extreme case, educational enrolment completely hinders childbearing to the point of not having children ever. This choice is the outcome of several factors that vary according to educational differences. For less educated women, this could be due to their worsening life conditions and prospects, due to economic hardships and an increasingly unstable job market (Van Bavel et al., 2018). For highly educated women, instead, it is usually attributed to the work-family conflict. Although all educated groups experience childlessness, this is usually more prevalent among well-educated women. In Europe, well educated women have the highest excess childlessness in the South, where there is a lack of family-work reconciliation policies (Beaujouan & Berghammer, 2019). In these countries, scholars have noticed a positive relationship between enrolment and childlessness for women (Bagavos, 2010). These behaviors may be due to several factors related to enrolment, including age, lost wages, and changes in attitudes towards building a family. The opportunity cost of having a career after the investment made in human capital also plays a crucial role in foregoing children, as a consequence of educational enrolment. A similar mechanism is seen with regards to educational attainment, which is positively linked to childlessness (Kreyenfeld & Konietzka, 2017).

After exiting the educating system, the level of education attainment still plays a role in shaping the behavior of individuals with regards to having children. For a long time, scholars have observed a negative association between educational attainment and the timing of entry into parenthood (Kohler et al., 2002). Accordingly, lower educated women have their first child early, while women with high

educational attainment tend to postpone childbearing until well after their graduation. The negative educational gradient is mostly due to mechanisms that derive from the consequences of being highly educated, such as better access to contraception and greater substitution effects. Highly educated women, more likely to enter the job market compared to lower educated women, have more probability to earn high wages and have steeper career trajectories (Mills et al, 2011). Therefore, they experience higher indirect costs of childbearing early in their career, urging them to postpone childbearing. This attitude tends to decline once they have reached good economic stability and they feel well-established professionally. On the other hand, lower educated women experience early childbearing because of low aspirations or insufficient knowledge of contraception. (van de Kaa, 1987; Lesthaeghe, 2010).

1.3.3. Fertility behavior: subsequent birth orders

Higher-order parities are linked to female education as well, due to both fertility and non-fertility related factors. First, the likelihood of having an additional birth stems from fertility decisions related to birth spacing and fertility timing of previous births. Biological constraints would require women to have their first child early, in order to have a longer fertility window for subsequent births. Instead, large delays of first birth significantly reduce the likelihood of higher order births. When women manage to have second and subsequent births after first birth postponement, the intervals between births must be very short to fit in the shorter reproductive window. Therefore, high-order births are conditional on fertility behavior at the time of the first birth.

Nonetheless, the postponement of first births may lately cause a "time squeeze" effect, where women catch up with second and even higher-order births (Kreyenfeld, 2002). In order to meet their fertility goals, they deliberately reduce birth intervals to make up for lost time. That means, a positive educational gradient for second births may be due to the time squeeze, rather than strictly to educational attainment. This phenomenon has been observed for second and higher parities in northern Europe, where women resort to recuperation of lost fertility at older ages, resulting in an overall higher lifetime fertility (Andersson et al., 2009).[15]

Second, parity progression is heavily influenced by education. The literature notably identifies a strongly negative relationship between the number of births and the level of female education (Skirbekk, 2008). The postponement of the entry into parenthood significantly shortens the reproductive window of an individual. Longer educational enrolment that forcibly delays first births

[15] Fertility recuperation has also been observed in other countries, among which Italy. The fertility recovery of Italian women is described in the Second Chapter of this dissertation.

adversely affects higher-order births as well. This often translates in the fertility gap between intentions and actual fertility of highly educated women.

On the other hand, a positive educational gradient has been observed for higher order births (Kravdal, 1992; 2001). In fact, as with higher education come more resources, a previous birth postponement might not hinder women from having more than one child. Instead, delayed entry into motherhood might allow highly educated women to exploit their job position to accumulate earnings, which can lately be invested into a higher number of children. Moreover, well-educated women with a stable occupation can afford to take a break from employment to pursue childbearing or take up a more flexible job with lower opportunity costs (Kravdal, 2001; Pirani & Salvini, 2015). Less educated women, instead, face lower opportunity costs for additional births with regards to their income, but are incapacitated by higher direct costs of childbearing. Furthermore, lower levels of education are usually linked with less stable and flexible occupations. Consequently, higher levels of education may enable women to have higher number of children, despite the initial fertility postponement due to human capital accumulation, contrary to less educated women.

Recent trends show a convergence of fertility towards a two-child family ideal across all educational levels (Sobotka & Beaujouan, 2014). While this empirical evidence seems to point in a positive direction compared to earlier studies indicating a fall to lower family sizes, total fertility rates (TFRs) are going to suffer this convergence.[16] In other words, third and higher order births are likely to become rarer and their weight on TFRs will be increasingly evened out by the growing trends of one-child families and childless women.

1.4. Contextual variations in the association between fertility and education

Several theoretical frameworks profusely refer to the importance of considering the social and institutional context when describing the association between education and fertility. The motives behind fertility preferences and behaviors are, in fact, due not only to personal values and attitudes, but also to external factors. The context where an individual is immersed greatly turns one's choices in one direction or another. Therefore, different fertility outcomes by context can be observed.

This section intends to provide an overview of how different contextual combinations can influence the fertility outcomes of couples and, in particular, of women. Among the several variables shaping the relationship between education and fertility, this section focuses on the labor market structure and

[16] Sobotka and Beaujouan (2014) observe a gradual increase in the prevalence of the one-child ideal, which has become more common than three-children ideals in several European countries, among which Italy.

regulation (Section 1.4.1), policies and welfare regimes (Section 1.4.2) and the role of attitudes towards motherhood and social norms, with a focus on gender (Section 1.4.3).

1.4.1. The functioning of the labor market

The economy and the labor market are two major determinants of fertility choices and behaviors. By determining the economic security of a couple, the economic and labor climate might encourage or curb the willingness of individuals to start a family. While corresponding returns of education are better opportunities, higher income, higher security, self-fulfillment, these are mediated by economic fluctuations and the labor environment.

The effects of education on fertility depend first on the couple's socio-economic status. Economic hardship worsens the living conditions of individuals and constraints their choices in several aspects of their lives. Deteriorating economic conditions and employment prospects are linked to declining marriage and fertility rates (Sobotka et al., 2011). High levels of unemployment and poor economic conditions have exceptionally severe implications for the younger population's fertility, as they affect their long-term well-being and ability to start a family (McDonald, 2006). Socioeconomically disadvantaged married couples, thus, tend to delay their transition to parenthood (Sobotka et al., 2011). It follows, financial woes have strong negative impacts on fertility.

Short-term or temporary employment contracts can increase economic uncertainty through penalties in wages and large volatility. The unstable financial conditions deriving from this type of precarious employment decrease the probability of union formation and ultimately provoke a decline in fertility. In an environment of high insecurity, repeated episodes of temporary employment decelerate wage progression and increases the likelihood of future unemployment for women, which leads to even stronger economic uncertainty. At couple level, the negative effect of women's employment may be altered by the partner's occupation. When both parents are employed with permanent contracts, fertility increases, while when they are employed on temporary contracts, the opposite effect is found. Thus, temporary contracts reforms may lead childless women to put off having children with negative consequences on total fertility (Pieroni et al., 2023). In regions like southern Europe, where welfare systems are inefficient, temporary employment causes an even steeper fall in fertility.

Rising inequalities in the labor market spread the perception of economic insecurity and inequality, in particular among the youth. Economic recessions and job market instability influence the perception of a secure future and, consequently, the fertility choices of couples. In the context of economic insecurity, it becomes difficult to engage in long-term commitments and individuals delay fertility to less uncertain times (Easterlin, 1976; Kohler et al., 2002). Therefore, lasting uncertainty stemming from job loss or the possibility to become unemployed forces women to have fewer

children or postpone childbearing, especially in the case of well-educated groups (Sobotka et al., 2011). High educated women are also more aware of the opportunity costs of unemployment, which rise in times of financial insecurity (Adserà, 2011; Modena & Sabatini, 2012). Economic uncertainty also reinforces the relationship between fertility and education through the feelings of insecurity instilled by recessions and globalization. Uncertainty about the future and one's economic stability increases the demand for higher education, which might give a best chance at economic well-being.

Additionally, job insecurity influences the fertility choices of couples across all levels of education. Job instability has consequences concerning the number of resources that individuals can invest in building or enlarging the family. In this environment, an unemployed woman with low education may decide to enter motherhood earlier, as less educated women perceive childbearing and their career as alternatives (Neels et al., 2013). On the contrary, highly educated women who are unemployed or face unemployment might postpone or even forego having children until they reach a more stable and secure status (Vignoli et al., 2012). Nonetheless, the influence of unemployment on women's fertility choices heavily depends on other factors, especially the role and expectations placed on them within the family.[17]

Women who are already mothers also face several other difficulties on the job market. Their intentions of having an additional child might be curtailed by adverse labor market conditions. Compared to men, women are generally paid less, have less career prospects and their occupations are often less stable than men. These factors, along with economic recessions, discourage them from having an additional birth (Kreyenfeld & Andersson, 2014).[18] On the other hand, women selected for lower-paid jobs that curtail their career prospects can more easily reconcile work and family, as they are more flexible and stable (Adserà, 2017). In other words, the competing goals linked to children and career advancement often pressure mothers who want to remain in the labor force to forgo their non-family aspirations.

As childbearing implies facing high direct and indirect costs for women, the financial and labor dimension of having children is extremely relevant when addressing fertility issues. These implications can be manipulated at the state level, by resorting to labor and economic policies, as well as supporting mothers and families through state intervention.

1.4.2. The role of policies and welfare regimes

Welfare regimes and policy implementation are two instruments the state can rely upon to manipulate the relationship between education and fertility levels. With regards to fertility, a welfare system may

[17] "Whether a woman whose position in the labour market is insecure will postpone childbirth varies according to whether she is expected to be a caregiver or household provider after childbirth" (Kreyenfeld, 2010).

[18] Higher parities are strongly influenced by financial factors, vis-à-vis the first birth (Bulatao, 1981).

prioritize a certain policy area, such as employment or public services, and interacts with the private sphere of the family ultimately affecting fertility behaviors. Familistic regimes, typical of conservative and traditional states like southern Europe, expect the family to be the main bearer of childrearing responsibilities. The north of Europe, on the contrary, is commonly identified as de-familiarized, as public institutions provide large support to the family through the welfare system. In other words, welfare regimes and policies can either encourage or constrain individuals' fertility choices, for example through family-related services or unemployment aid. Thereby, fertility quantum, timing and age distribution can be reshaped. Welfare systems that support young mothers may shift down the age distribution of fertility, ultimately resulting in a younger population and a potential boost of overall fertility.

Family policies can be categorized into three groups: affordable childcare services and education for children; subsidies and tax benefits intended to encourage fertility; labor market policies, directed at improving working conditions and easing the burden of building a family while being in the workforce (Neyer, 2003). The first category of family policies has an impact on both direct and indirect costs of childbearing. The availability of childcare services eases the opportunity cost faced by women in the labor force who must reconcile their job with caring for children at home. As a consequence, the lack of childcare centers causes a reduction in fertility, especially for working mothers. Moreover, unaffordable childcare services may not be accessible for all women, in particular those with lower education and less resources. Nonetheless, available and affordable public childcare does not necessarily translate into higher fertility. In fact, this service is often accessible for limited hours, incompatible with full-time working arrangements, and women with non-flexible occupations may not be able to take advantage of it. Childcare services should then be made more accessible by combining social and labor measures with family policies.

Financial policies may help raise fertility in multiple ways. Cash transfers can directly impact the income level of individuals, thus having a positive effect on the direct costs of having children. Tax benefits are, instead, designed based on the number of children or the parents' income, indirectly reducing childbearing costs (Gauthier, 2007). Policies of this type may also be targeted at stages traditionally preceding family formation; for example, governments may intervene by indirectly lowering housing prices for young people, which in turn allows an earlier transition to parenthood. A similar effect is achieved by policies of the third type, which concern working hours, flexibility, and parental leave. They may be able to alter individuals' preferences towards childbearing by reducing the indirect costs of childbearing (Gauthier, 2007). Indeed, policies targeted at highly educated women may help them to reconciliate working and building a family.

In short, these policies' effects are not uniform across birth parity, educational levels, cohorts, and countries. The differences among countries are due to several factors. Some states intervened in response to changes in female emancipation by putting in place welfare protections and measures targeted at the reconciliation of traditional behaviors as family-building with the emerging figure of the employed woman. In these cases, the decline of fertility slowed down or even reversed. In other states, like southern Europe, the response to the demand of reform was insufficient and governments were unable to efficiently address the fertility decline, which often reached very low fertility levels (Chesnais, 1996). Today, the implementation of family policies is conditional on the country's government and social norms and varies by welfare state. Social democratic economies usually raise taxes to supply formal services, whereas liberal economies implement fiscal policies and financial benefits by exploiting market-based systems (McDonald & Moyle, 2010).

Finally, the mitigation effect of family policies might be curtailed by gender inequalities. Indeed, the effectiveness of fertility policies heavily depends on their compatibility with the social and cultural norms of a country. Different educational groups do not generally respond uniformly to egalitarian policies, which may face rejection from certain cohorts in gender-inegalitarian environments. Such policies are usually welcomed first by the highly educated, attitudes that only later diffuse to less educated individuals. Gender-egalitarian policymaking allows women to reconcile the role conflict they face and raise their fertility and might ultimately help meet the fertility targets of policymakers (Adserà, 2011). In short, effective labor and family policies must be coupled with gender-egalitarian measures to ensure their effectiveness in fertility terms.

1.4.3. The role of attitudes and social norms

The existence of gender norms and roles has imposed long-lasting constraints on women. The common condition of women within society and the family was dictated by the well-known male-breadwinner and female caregiver model in most Western societies (Lesthaeghe, 2014; Van Bavel et al., 2018). Women were long associated with domestic duties, such as housework and caring for children and elders, and thus were segregated from the male world, where men have outside roles as bread earners. This traditional division of labor was only challenged by the expansion of female education and their newly emerged possibility to enter the labor force and become independent from men.

While access to education and the labor market has favored the emergence of the dual-earner model, where both partners earn an income, gender roles within the family often remain faithful to traditional norms (Blossfeld & Drobnic, 2001). In southern Europe, there is strong adherence to traditional gender roles. The male-breadwinner and female-caregiver model still prevails as the widespread

perception of gender roles in the family. The man does not participate in household or children care. As these countries are characterized by inefficient support to families through the state, gender inequality in the household places an even heavier burden on the shoulders of women (Mills et al., 2008). Ultimately, women are forced to lower their fertility intentions as they were not receiving support from their partners or the state. On the other hand, Nordic countries in Europe are characterized by more equitably shared gender roles, borne by both partners inside and outside the household. This gender-egalitarian climate is one of the determinants of near matching levels of actual and intended fertility (McDonald, 2000; 2013).

Differences between genders that affect fertility behaviors are due to gender equality and equity. Gender equity is a long-term process that measures fairness and access to opportunities for men and women and ultimately leads to gender equality, or equal outcomes for each of the genders. Educational enrollment and attainment are direct indicators of the level of gender equality in a region. They influence fertility both through work-family conflicts and intra-household bargaining power. Additionally, gender egalitarian attitudes can be spread by rising educational levels which contribute to reducing gender inequality in society and in the family (Goldscheider et al., 2015).

Structural gender inequalities have consequences on women's fertility behavior. Countries with no institutional and family support for women are unfit to reduce women's cost of career progression in the realization of their fertility plans. What is more, fertility decline to below replacement levels is associated with a mismatch in the level of gender equity between individual-oriented institutions and family-oriented institutions (McDonald 2000). In other words, low fertility rates are associated with an "incomplete gender revolution", in which gender equality may be apparent in institutions of education and employment but not in the socially shared norms (Anderson & Kohler, 2015; Goldscheider et al., 2015; McDonald, 2000). For example, highly educated women with strong ties to the labor market may reduce their fertility or forego childbearing because of gender inequality and the large work-family conflict they face (McDonald, 2013).

Education has an impact on dynamics within the family and calls into question the traditional role of the woman as the main caregiver. As highly educated women often enter the workforce, they may equal or even exceed the resources made by their partner. This, combined with having less time available to take care of the house and family, affects the gendered division of labor within the household. Indeed, they start acquiring bargaining power in decisions concerning the traditional roles of the male and female figure in a family.

As a consequence, highly educated women more often expect their partners to participate in childrearing and household labor and are more likely to partner with a man that is willing to do so (Goldscheider et al. 2015). In gender egalitarian societies, time availability and relative earnings

determine the share of each partner's involvement in chores and childrearing. However, these expectations are often not met, and women still do much more housework than their husbands on average, especially if the couple has children. In some cases, educated women earning more than their partners take care of even larger shares of caregiving and chores (Van Bavel et al., 2018). In other words, gender segregation in the home and the family still remains strong and well-earning women can still be an undesirable choice as a men's partner.

It follows, more egalitarian gender relations can raise fertility rates. In Europe, this is especially true for highly educated women, that were the forerunners of the fertility decline in the region. Gender-egalitarian norms and family-support policies enable well-educated women to have higher fertility, by reducing the opportunity cost of having children vis-à-vis employment. Such response to policies promoting gender equality has been observed in Nordic countries and France, characterized by supportive institutions and norms (McDonald, 2013). In these countries, the support offered by the welfare state and institutions brings the actual number of children closer to the fertility intentions of the couple. Moreover, higher educated women in gender-egalitarian societies have been able to raise their fertility intentions ultimately resulting in a higher number of children (Sobotka et al., 2017).

1.5. Summary

This Chapter provided an overview of the association between fertility and education, in particular with regards to the European region. The discussion specifically centers on the intervention of educational differentials in the fertility decline experienced by developed countries in the most recent century, with a focus on female education. While the relationship between the two variables is apparent, the ramifications of education are very complex and influence fertility intentions and behaviors in multiple ways.

Over the years, several frameworks have been developed to describe the association between fertility and education. In most cases, each theoretical perspective advances arguments based on single dimensions of the association, selecting among social, cultural, economic and other types of mechanisms at play. Despite the very large body of literature, neither perspective has been able to tackle the extremely complex nature of the fertility-education relationship. The theories presented in the second section (Section 1.2) are notably unable to accurately describe wider trends in fertility, as they are mostly concerned with macro-level behaviors and overlook the individual dimension of behaviors. In particular, the ability of the individual to respond and adjust to contextual changes is difficult to determine and quantify. Yet, it represents a crucial variable to capture the significance of fertility behaviors and attitudes.

Individual fertility choices are informed by the interplay of multiple factors. While economic determinants without doubt play a significant role, social and cultural elements deeply influence fertility attitudes, even before the individual makes a choice. The environment where one grows up, the characteristics of both the private and the public spheres, the underlying gender and social norms all contribute to the emergence of values and attitudes towards fertility. Later in life, the economic and political climate, including the labor market and the welfare regime, redirect fertility intentions based on the opportunities presented to the individual. At all stages, education further molds both intended and achieved fertility.

First, educational enrolment greatly discourages female fertility through an investment in human capital, rising aspirations and better access to contraception. Then, depending on the educational level attained, different degree factors alter women's perception of motherhood. Individualistic values, income coming from employment, self-realization through their career, all encourage the departure from traditional family and gender roles, towards female emancipation. Consequently, educated women often postpone births to dedicate their time to self-fulfillment outside the household, turning later (with a lower achieved total fertility), or never, to motherhood.

Gender equality is one of the main factors influencing women's fertility choices given their level of education. in the right circumstances, gender egalitarian norms bolster female fertility. On the contrary, the persistence of traditional gender roles, the lack of affordable childcare services, limited welfare support for families and mothers, and an overall conservative and adverse environment for women usually characterize countries where the educational gradient divergence is more serious.

From a broader perspective, individual choices in terms of fertility must be measured against the institutional and structural constraints that prevent or favor the achievement of fertility intentions. The effects of education on fertility behaviors depend on the social, economic and institutional contexts of different societies. Contextual factors include societal values, gender norms, labor market characteristics, the economy, policies and welfare protections. The economic and tax systems, as well as labor policies, dictate the income available to individuals and the resources that can be destined for childbearing. The type of welfare regime put in place by the state affects the degree of security and protection felt by workers and the population as a whole, consequently influencing fertility choices. Family policies are associated with reduced costs of childbearing and fertility increase. Policies targeted at reducing the work-family conflict range from a well-developed childcare system, to longer and paid parental leave, to flexibility in the workplace in terms of hours and place. However, the interplay between education, fertility, family policies and gender contexts is extremely complex and it must be carefully addressed when drawing conclusions on their relationship. Additionally, the

outcome of a specific policy might be influenced by effects of previous policies and, therefore, could be unable to effectively target the issue of declining fertility.

In conclusion, education represents an extremely relevant variable for predicting and influencing fertility choices. Its significance is also foreseen to increase, as the overall educational level of the population will rise in time, pushed by a momentum of educational improvement (Samir & Lutz, 2017). As education levels increase, more and more years of schooling will be required to be considered well-educated among the population (Lutz & Skirbekk, 2013). This mechanism will reiterate and strengthen for future generations, ultimately resulting first in progressively postponed fertility and, as a consequence, lower rates of achieved fertility. In other words, as the fertility changes induced by the educational expansion will grow in magnitude, it becomes increasingly compelling to act to restrain the downsides while preparing the soil for harvesting the positive implications of rising education.

2. THE INFLUENCE OF EDUCATION ON FERTILITY: ITALY AS A CASE STUDY

Among countries with low fertility levels, Italy has particularly attracted the attention of local and international demographers, researchers and scholars. After becoming one of the first countries to reach very low fertility rates in the mid-1990s, the issue of low fertility has remained a persistent cause of concern for Italian politicians and demographic experts. A number of provisions has been introduced to raise fertility, but structural, social and cultural features of Italian society have prevented these measures from having the desired effect. Despite these numerous efforts of successive governments to address the fertility question, birth rates have continued to decline even in times of economic expansion when individuals tend to make positive fertility choices. The implications of consistently declining fertility concern several domains and, as they grow over time when not efficiently addressed, they could become hardly possible to resolve.

Low fertility levels are greatly contributing to the fast population aging of the Italian population, where shares of older people are growing while increasingly less children are born, shrinking the working population of the future. The low number of births will, in fact, translate in less individuals entering the labor force, which will age, whereas the share of the population in retirement proportionately grows. As the welfare state is funded by taxation, mostly sustained by individuals participating in the labor market, a smaller working population vis-à-vis an overall older population results in increasingly unsustainable welfare services, such as the Italian pension and healthcare systems. Besides having alarming consequences for the economy, as dependency ratios are critically rising (in Italy, structural dependence rose from 49.1% in 2002 to 57.6% in 2024), an aging population causes also political shifts and social unrest (Istituto Nazionale di Statistica [Istat], 2024b). The former could emerge when the pool of voters is consistently aging, resulting in the shift of the political agenda towards policies benefiting older cohorts which have become the largest share of the population. Such events may then produce social dissatisfaction with the public and governing systems, which could eventually spark tensions across the country. Hence, instability and social unrest could arise from the economic, political and social implications of low fertility.

To address this alarming fertility question, it becomes imperative to investigate the causes of low birth rates considering the several factors influencing a couple's fertility decisions. As stated in the previous Chapter, among the numerous variables associated with fertility outcomes, education represents a crucial determinant of individual values and choices relating to childbearing and family building. Although the number of university (male and female) graduates is still comparatively low with regards to other European countries, education has played a significant role in the Italian fertility

decline. By guiding the life choices of women in particular, educational attainment determines their status and perceived role in both the external (society) and private (family) spheres. In Italy, the influence of education is intertwined with the existence of other structural and social factors that further complicate the road to parenthood. In the case of women, education determines the obstacles that an individual will face vis-à-vis their fertility intentions. Both the higher and lower educated face difficulties when they desire to become mothers. The former encounter difficulty in reconciling the work-family conflict due to minimal welfare protection and support from the state, while the latter are often subject to severe budget constraints and lack of policies targeted at one-income households. It follows, the issue of low fertility is extremely alarming and central to several policy domains beyond the strictly demographic implications, including the social and economic spheres.

This Chapter paints the picture of the Italian fertility evolution through time, including an analysis of the contextual factors affecting the relationship between Italian fertility and educational levels and an overview of generational change in fertility attitudes and behaviors with regards to female education. The first section reports the historical unfolding of the decline of Italian fertility in the last 80 years (Section 2.1.2), including the examination of geographical differences (Section 2.1.3) and the expansion of education that is later linked to the fertility decline (Section 2.1.4). The following section outlines an overview of the context in this country that has contributed to overcomplicating the chance of making a change in reproductive behaviors (Section 2.2). The effort of governments (Section 2.2.3) thus far has proved inefficient in tackling the decline and stagnation of fertility levels also due to these rigid social (Section 2.2.1) and economic (Section 2.2.2) features of the Italian context. An exhaustive description of the fertility question can inform Italian politicians on how to best tackle the insufficient reproductive behavior in Italy and address the unprecedented population aging that the country is currently facing. Then, the third section presents an analysis of the fertility behavior of well-educated women born in three different decades developed with the support of an Istat survey conducted in 2016 aimed at gathering information on life and fertility choices of Italians (Section 2.3). In particular, this section attempts to identify and highlight any change in the fertility behavior of women from three different generations (Section 2.3.1 focuses on 1960s women, Section 2.3.2 concerns 1970s women, while Section 2.3.3 regards 1980s women) based on their levels of education. Finally, the fourth section summarizes the Chapter and draws some conclusions (Section 2.4).

2.1. Fertility and education in Italy

The following section of this Chapter aims to describe the fall and evolution of fertility rates and the establishment and expansion of a national education system in Italy. The first section introduces the

Italian fertility decline in light of the broader southern European context (Section 2.1.1). The sections that follow focus on Italian fertility rates, attitudes and behaviors (Section 2.1.2), emphasizing the spatial variability of fertility in Italy (Section 2.1.3). Finally, the last section describes the education system in Italy from its establishment to the present, with a specific focus on higher and female education, to provide useful information for the analysis of the association between Italian fertility and education (Section 2.1.4).

2.1.1. Fertility decline: Italy within southern European dynamics

In Europe, the fertility decline was led by well-educated women.[19] New and modern attitudes and behaviors were first adopted by the higher educated in several social realms, among which life decisions in terms of life path, career and fertility. With regards to family formation, well-educated women were the first to revisit and change their behavior in terms of contraception, family sizes, family roles, and several others. Similar attitudes were later adopted by the lower educated through diffusion and imitation of social behaviors. Such dynamics have been theorized by Bongaarts' (2003) leader-follower model built, suggesting that fertility attitudes diffuse from more educated women to less educated ones, leading to a decline in fertility across all levels of educational attainment. An initially large gap in fertility between the higher and lower levels of educated women gradually shrinks as transition progresses. In fact, the diffusion of fertility behaviors ultimately results in their homogeneity across education groups. While there remain educational differences in family formation and childrearing behaviors, the adoption of these attitudes and behaviors from the well-educated first and the lower educated later caused the wide fertility decline observable across the whole continent.

The decline of fertility and the persistent low fertility levels were not homogeneous across the European continent. From a cultural perspective, southern and Mediterranean countries were expected to have higher low fertility levels compared to their northern counterparts. This trend was in place for most of the 20th century (White et al., 2007). Cultural factors as Catholic values, strong familism and the traditional character of local societies should have kept fertility from falling significantly below replacement levels in southern Europe. Lower numbers of divorces and a strong dislike of non-marital cohabitation and out-of-wedlock births were further encouraging factors at play in southern countries with regards to higher fertility. Surprisingly, the northern Protestant, less traditional, more secular and individualized countries overrun their southern counterparts: at the end of the century fertility levels were higher in the north of Europe. The longstanding fertility differential between northern and southern Europe was unexpectedly reversed (White et al., 2007).

[19] See the expansion of female education's role on the decline of fertility in Europe under Section 1.2.1.

This reversal of fertility levels characterized all southern European countries, which have similar demographic history and have followed similar paths of declining fertility. Fertility rates – the highest in Europe until then – began decreasing in the whole area in the 1970s, when the number of births started to fall steeply (Zambon et al., 2020). All Mediterranean countries shifted towards aging population structures and reached very low fertility levels simultaneously in the 1990s (De Rose et al., 2008). The fertility contribution of growing number of immigrants and spread economic expansion allowed a short period of fertility recovery at the start of the new millennium, before the 2008 world crisis hindered fertility once again across the whole macro-area (Zambon et al., 2020).

Southern European paths of fertility decline are made alike by similar non-demographic characteristics of these countries. In this area, women's fertility choices are hindered by widespread peculiar features of the state, the market and society. While in some European countries the association between fertility and female labor force participation has reversed and has become positive since the 1980s, this association has remained negative in southern Europe (Del Boca et al., 2005). Here, the conflict between a professional career and family life seems to still be difficult to resolve, especially for women, for various reasons. Firstly, southern European states have not built a welfare system of support to families that can efficiently alleviate the direct and indirect costs of childbearing. The limited supply of public childcare services and the short hours when they are available make them an insufficient and inappropriate solution to address the need of working parents, especially if they are employed full-time. In turn, women would be expected to adapt their professional schedule with childcare services by working part-time, rarely available in southern Europe, or by quitting their careers, mostly an undesirable option as single-wage families are not well off. As a consequence, a large number of southern European families rely on grandparents' support to take care of their offspring.

Additionally, the welfare benefits and protections are not sufficient for parents to buffer the risks of economic downturns and hardships in southern Europe. Because care work within the family is taken for granted and there are no minimum provisions, the Italian state essentially controls women's (and other family members') paid and unpaid labor, treating them primarily according to their gender roles in terms of their responsibilities while they are left unprotected on the labor market (Trifiletti, 1999). Similar insufficient and inefficient social environments can be found elsewhere in the macro-area. Finally, the large public debt of these countries discourages the ruling class from adopting new extensive welfare measures, although effective fertility policies are necessary to sustain the aging populations in the long run.

Secondly, the labor market is difficult to enter, it does not offer very stable and secure contracts, and it makes young individuals dependent on their parents well after they exit the school system. To cope

with labor market obstacles to their independence, young southern Europeans increasingly postpone leaving the nest. While the average age to become residential independent in Europe is 26.3, all Mediterranean countries lay above the mean, with children leaving the parental home only at around 30 years of age (European Parliament, 2024). In this region, the tendency to stay longer at the parents' house has coincided with the postponement of marriage and childbearing (Rosina, 2004). In fact, staying at the parents' home prevents a faster transition to adulthood and, in turn, to marriage and parenthood; additionally, as age advances it becomes even less likely for children to leave the family household with severe repercussions on fertility, as residential independence remains a crucial precondition of the transition to parenthood (Santarelli & Cottone, 2009).

Italy's fertility issues are fairly aligned with the rest of the southern region of Europe, as it will be argued below. In this macro-area, traditional gender and family norms govern the social constructions of partnership and family formation. The resolution of the conflict between career and family is extremely difficult, especially for women who are culturally expected to primarily take care of the family. The welfare state does not offer extensive and effective protections for working women or men, in particular those who are subject to job and workplace rigidities. Nonetheless, Italy has some peculiarities beyond the southern European commonalities; these are examined in the following sections.

2.1.2. Fertility decline in Italy: a brief overview

Italian fertility rates have changed (or better, declined; **Figure 1**) considerably during the last 65 years, synchronized with the declining trend across Europe. The Italian "baby boom" phenomenon started in 1959 and lasted 5 years, when TFR reached a peak of 2.70 children per woman. In 1964, TFRs started to decline, reaching below-replacement levels in the 1970s (1.97 children per woman in 1977) and very low levels in the 1990s (1.26 children per woman in 1993 and the record low fertility in 1995 of 1.19 children per woman). A slight recovery took place from the end of the 1990s until 2010 (the TFR rose above the lowest low threshold in 2004 to a peak of 1.44 in 2011), when the Great Recession pushed fertility down again, as Italians delayed family commitments. Youth unemployment, roughest labor and contract conditions, general feelings of uncertainty and insecurity particularly affected the intentions and capabilities of Italians to have children, especially in view of the limited welfare protections available in Italy for young people. Since then, Italian fertility rates have continued to slowly decline until today (the TFR was 1.20 in 2023). A very modest improvement of 0.01 was observed in 2021 which however cannot be considered the Italian equivalent of fertility recovery observed in other European countries.

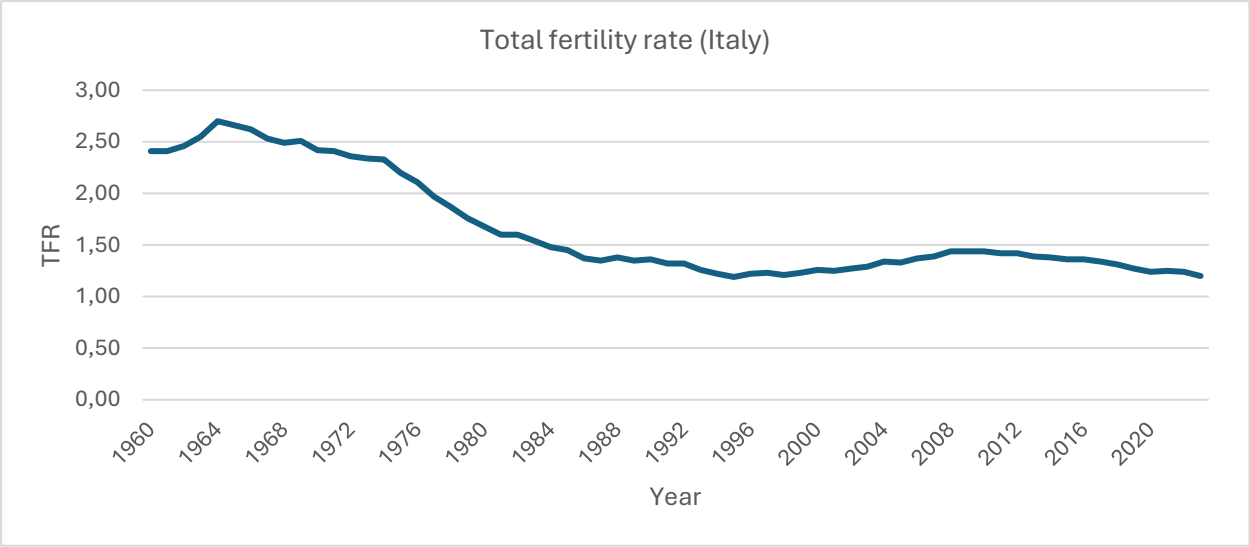

Figure 1. Total fertility rate (TFR) (1960-2023). Italy. *Own elaboration of Istat data (2024).*

The overall decline is determined by the decrease in third and higher order births and the increasingly common trend of postponing the birth of the first child. Starting from the cohorts of women born in the late 1950s, the age at first birth started to rise and the tendency to delay the entry into motherhood became more common each decade (Caltabiano et al., 2009). This growing trend can be attributed to the rise in female education observed for the 1950s cohort of women whose aspirations for professional rather than family life caused the emergence of the work-family conflict (Billari & Rosina, 2004). Continuous fertility postponement may turn into involuntary permanent childlessness when women encounter unforeseen infertility issues, or they are not able to meet the preconditions for the transition to first birth. In the latter case, insufficient financial means, unstable partnerships, and insecure occupations may be among the factors inducing involuntary childlessness in Italy (Tanturri & Mencarini, 2008). Instead, when remaining childless is a deliberate choice, this decision is informed by non-traditional values and a stronger sensibility to the high opportunity costs of childbearing, as in the case of career-oriented and well-educated women who may seek personal fulfillment through means other than the family (Tanturri & Mencarini, 2008).

Delaying fertility was first made possible by the spread of contraceptive knowledge and use among the Italian population. The so-called second contraceptive revolution generated a significant change in the perception of contraceptives and the use that women made of them to control fertility and decrease the number of unplanned births. The control of marital fertility was first adopted by well-educated Italian women (Dalla Zuanna et al., 2005). The spread of contraceptive use among this group of women has contributed to the fall in additional births, a correlation that is remarkably noticeable in the southern regions, who are more likely to have a third birth than northern and well-educated

women (Impicciatore & Dalla Zuanna, 2017). Considering the weight of contraception on the probability of having an additional birth, it can be argued that having an additional child is often the result of a casualty rather than a choice in the case of lower educated women who do not have access to contraceptive measures in the same degree of well-educated individuals (Impicciatore & Dalla Zuanna, 2017). Therefore, in Italy higher educated women led the change towards controlled fertility and less births per woman.

Controlled marital fertility led the way for shrinking family size norms starting from the fertility intentions of women born in the 1960s. If the cohorts in the first half of the 20th century tended to adhere to the two-child family model, which represented already a shrinkage in family size compared to the past, from the 1960s cohort onwards women with one child surpassed the number of those who had more at the end of their reproductive window (De Rose et al., 2008). The decline in second and third births became one of the major drivers of the fall in fertility at the start of the transition towards below replacement levels of fertility in Italy (Billari, 2008).

After very low fertility levels were reached in the mid-1990s, the slight recovery of fertility observed at the end of the decade was facilitated by several novelties. The diffusion of non-traditional family arrangements among the youth boosted the fertility of young Italian couples. The rise of alternatives to formal unions is associated with the weakening of the role of marriage with regards to fertility decisions. The revolutionary social and cultural changes concerning marriage and childbearing in the wider Second Demographic Transition framework brought about a "new demographic spring" in Italy (Dalla Zuanna, 2005, p. 1061, as cited in Billari, 2008). Rising number of births outside marriage characterized Italian fertility rates starting from the 1960s have represented a major factor of fertility recovery in the early 2000s (Billari, 2008). In compliance with a larger European trend, marital unions stopped representing a precondition for births and became positively related to fertility rates after the emergence of very low fertility in the 1990s (Billari, 2008).

Growing immigration rates have further contributed to depreciate the Italian fertility decline. Through the phenomenon of replacement migration, according to which immigrants tend to have higher fertility compared to the local population, immigrant births compensated at least partially low fertility rates in Italy (Billari, 2008; Caltabiano et al., 2009). In the first decades of the 2000s replacement migration in Italy has prevented the population from steeply declining. However, immigrant fertility has been declined overtime and the positive effect of immigrant births on Italian fertility and population growth is losing its magnitude (Istat, 2024a).[20]

[20] This is possibly due to the convergence of fertility attitudes between immigrants and Italians, as the former observe and imitate the latter due to a socialization effect (Section 1.2.4).

The modernizing tendencies emerging in Italy were, to some extent, due to increasing female education and economic autonomy achieved by women during the years.[21] First, well-educated Italian women are enrolled in education for longer than their high school educated counterparts; the consequences of such prolonged permanence in the educational system are twofold. Initially, their transition to adulthood is slower, as they tend to remain economically, and often also residentially, dependent on their parents (European Parliament, 2024). Once they graduate, they enter the labor force at an older age compared to their less educated peers, which further delays their economic autonomy. Before transitioning to family building, they often wait for a well-paid and stable occupation in order to accumulate enough security and resources to raise a child at their best capability (quantity-quality trade-off). Moreover, they hold higher ambitions than less educated women for both their personal and professional lives, which might take longer to achieve. Therefore, they are more likely to postpone having their first child and, in some cases, even to remain childless.

In other words, the link between lower fertility and rising educational levels is strictly correlated with the delayed entry into motherhood of well-educated Italian women (Impicciatore & Dalla Zuanna, 2017). In fact, Italian women's educational attainment is negatively correlated with the probability of having a first birth, especially when they are younger. Female education is instead positively correlated with higher fertility at older ages, as Italian women "make up for lost time" after having completed their studies and possibly begun their professional career (Caltabiano et al., 2009, p. 704).[22] After the first birth, an educated woman is also more likely to have a second child if the first birth occurs early enough for her to remain in her fertile window. It follows, better educated Italian women accelerate the transition to their second child, according to a "time squeeze" effect, to fit the additional birth in their shorter reproductive window (Impicciatore & Dalla Zuanna, 2017, p. 2308).

Childlessness may thus be temporary among well-educated women if they decide to postpone childbearing and recuperate it later, producing a positive educational gradient on fertility and childlessness. On the contrary, voluntarily permanent childlessness is more common among more open- and modern-minded women, who distance themselves from traditional gender and family norms, and those who have received a higher education that are likely to strive for a life path different from the traditional one (Tanturri and Mencarini, 2008).

Nevertheless, higher educational levels do not necessarily translate in lower fertility goals. Contrary to common assumptions about fertility intentions of the better educated, Italian well-educated women do not wish to have smaller families; instead, it has been found that the mean intended family size of better educated women is higher than that of the lower educated (Testa, 2014; Testa et al., 2016).

[21] The influence of education on fertility attitudes and behavior are described in the first Chapter (Section 1.2).

[22] The phenomenon of fertility "recuperation" (Caltabiano et al., 2009) is discussed in Section 2.1.5 in terms of macro-regional differences.

Then, when well-educated women do not realize their fertility intentions (fertility gap), it is either because of fertility postponement or because of contextual factors hindering their fertility, which also affect the less educated in lower part.[23]

To summarize, several mechanisms determined the overall decline of Italian fertility levels. Broader use of contraception, declining marriage rates, higher female labor participation rates, and a common tendency to postpone the entry into motherhood characterized the behavior of Italian women over several decades. Most notably, expanding female education laid behind most of the growing innovative values, attitudes and behaviors that changed the fertility outcomes of Italian women. The well-educated pioneered contraceptive use, ambitions for life paths outside the family home and fertility postponement among others, which all contributed to declining levels of fertility.

2.1.3. Spatial heterogeneity of fertility: the "two Italy"[24]

When fertility considerations are tested against territorial differences, it is apparent that Italian fertility has not followed a homogenous path across its territory (**Figure 2**). The causes and outcomes of spatial variability of demographic factors such as fertility have attracted the curiosity of the academic community. Several authors have based their work on the study of regional and macro-regional fertility differences, finding a marked divide between the northern and southern regions which have followed two distinct fertility paths (Caltabiano et al., 2009).[25]

When the overall decline started in the mid-20th century, fertility sat at very different rates in the two geographical macro-areas. After the end of the Second World War, northern Italy fertility rates were at below-replacement levels, while the south still stood above replacement and rates were remarkably high, with high numbers of large families (with more than three children). With the 1960s baby boom, both macro-areas experienced a boost in fertility, which peaked simultaneously in the mid-1960s. Then, southern fertility started to slowly fall in the late 1960s, a decline that steadily continued in the following decades. In this area, fertility was so high at the beginning of the transition that in the early 1980s still stood above replacement levels in the south (White et al., 2007). On the other hand, fertility remained stable in the north and center throughout the 1980s and 1990s, with a short phase of fertility recovery in the 2000s, facilitating the national convergence to a moderate range of low fertility values around 2006 and 2007 (Caltabiano et al., 2017; White et al., 2007).

[23] The contextual obstacles to fertility are addressed in Section 2.2.

[24] The term "two Italy" was coined by Impicciatore and Dalla Zuanna (2017, p. 2294) to describe the significant difference in fertility rates between the northern and the southern parts of Italy.

[25] Throughout the entire dissertation, when "north" and "south" (and the adjectives "northern" and "southern") are used to refer to Italy, the former includes the north-west, north-east and central regions, while the latter includes the southern regions and the isles.

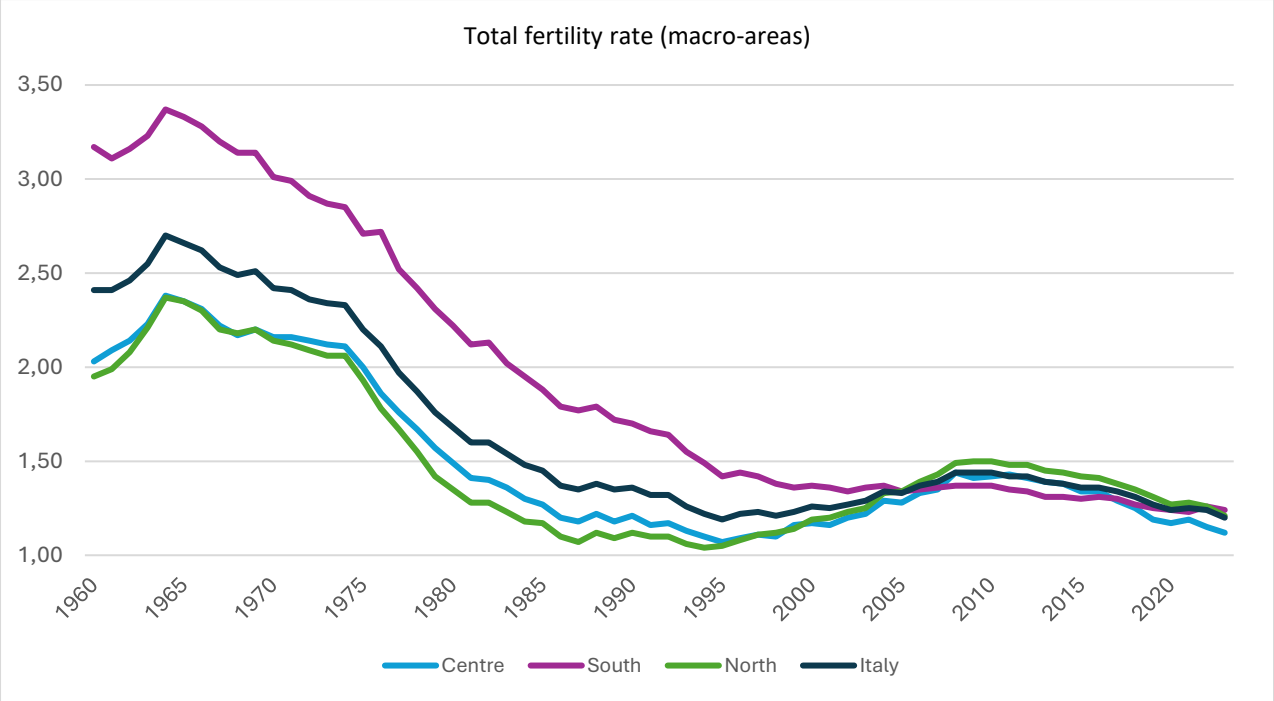

Figure 2. TFR across macro-areas (1960-2023). Italy. *Own elaboration of Istat data (2024).*

Numerous geographical differences between the two macro-regions originated from the socially, culturally and economically diverse local environments. Territorial differences are observable as early as in union formation. In the transition to new family building models, informal unions and non-traditional family arrangements spread unevenly according to local and contextual environments. Cohabitation was more common in the north compared to southern Italy, especially in bigger municipalities (Rosina, 2004). At the individual level, higher educated women were more likely to engage in premarital cohabitation than the less educated counterpart (Rosina, 2004).

With regards to fertility outcomes, the phenomenon of motherhood postponement that determined a raise of mothers' average age at childbearing over time varied across the country. In central and northern regions, the delay of the entry into motherhood and the large decline in marriages and births specifically characterized high educated women (Caltabiano et al., 2009). In northern Italy the mean age decreased to 27.3 in 1976 and, while in the south it reached the lowest point almost ten years later in 1982 at 27.7, both increased to above 30 in the new millennium for all women across the country (Istat, 2024c). Nonetheless, the rise in age at first birth did not necessarily correlate with extremely negative fertility outcomes in certain geographical areas. In these cases, Italian women recurred to late fertility recuperation, whereby those who have delayed entry into motherhood later intend to "recover" their fertility to achieve – to some degree – their desired family size, resulting in higher fertility at later ages. Caltabiano et al. (2009) observed that women born in the 1950s-1960s from

northern Italy had one of the highest levels of recuperation in Europe, second only to that of the Netherlands. The same impressive results were not observable in the south of the peninsula, where fertility recuperation was weak if not absent. Although not all lost births were recovered, fertility recuperation at older ages contributed to slow the overall fertility decline in northern Italy, where recuperation was widespread and significant (Caltabiano et al., 2009). On the contrary, considering women who do not recover fertility, childlessness rates had long been persistently higher in the southern regions than in the north of Italy, despite lower TFRs in the latter (Tanturri & Mencarini, 2008). This trend has recently reversed; while the number of childless women has stabilized in the south, northern Italy has seen a steep increase in childlessness rates since the early 2000s (Caltabiano et al., 2017).

The significant differences in fertility rates and behaviors between the Italian macro-regions in the northern and southern parts of the peninsula are also linked to several other variables that affect fertility. Contextual factors such as labor market functioning, welfare provisions and protections, gender attitudes and norms have contributed to differentiate fertility trajectories in the two macro-areas (Fanti et al., 2023; Impicciatore & Dalla Zuanna, 2017). Firstly, the rate of women that enters the labor market and maintains an occupation before and after childbirth differs considerably between north and south. For one, female labor participation is consistently higher in the north (**Figure 3**). White et al. (2007) found that women are more likely to enter the labor force when they live in regions where female participation in the labor force is higher, a mechanism that reinforces the difference between northern and southern Italy. In these regions, women were also less likely to transition to the first and the second birth (White et al., 2007). Additionally, unemployment levels affected fertility based on territorial differences: over the 1995-2012 period, growing numbers of unemployed women caused a fall in northern and central Italy fertility, whereas the same phenomenon had ambiguous effects in the south, as unemployed individuals seized the opportunity to have children (Cazzola et al., 2016).

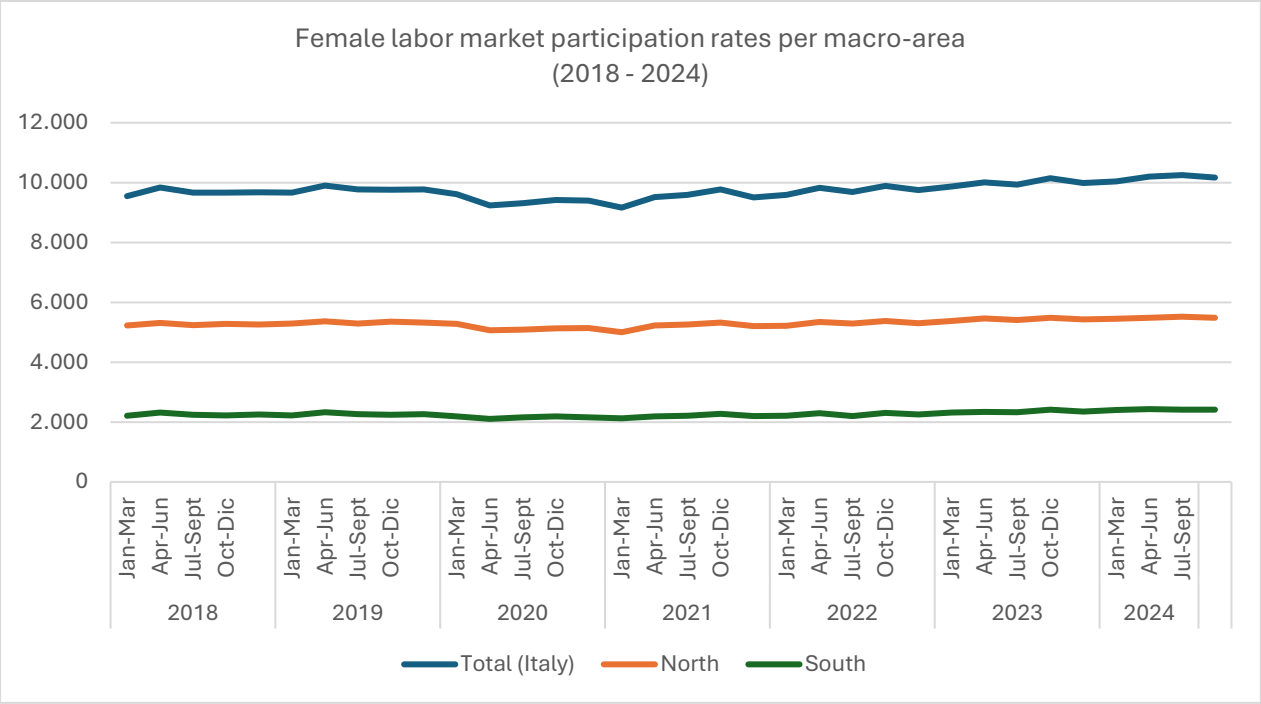

Figure 3. Female labor market participation rates per macro-area (2018-2024). Italy. *Own elaboration of Istat data (2024).*

Secondly, fertility behaviors depend on the attitudes, views and perception of women's role in society, both within and outside the family. The historically widespread male breadwinner and female caregiver paradigm has only lost its prominence in certain parts of Italy, while it remains the most common social interpretation of family and gender norms in others (Dotti Sani, 2012). These more traditional views are typically held in the southern parts of Italy where women are less likely to work and to maintain their occupation after giving birth. On the contrary, northern perceptions of gender roles are less conservative, women are more likely to be employed and be career-oriented and local societies are transitioning towards more gender-equal standards (Impicciatore & Dalla Zuanna, 2017). From the mid-1990s territorial differences became prominent again after decades of consistent decline in the whole country, as fertility took two opposite paths for around 15 years. Since the mid-1990s, a moderate but persistent increase in the overall number of births per year occurred in the northern regions. This fertility increase has been partly due to growing numbers of births to immigrant parents, as they had higher achieved fertility than that of Italian natives. Notably, northern fertility rates briefly returned to the levels observed two decades prior (before the early 2010s financial crisis would depress them again) and have been consistently higher than those in the south since 2006. Caltabiano et al. (2009) identified the cause in both the positive contribution of immigrant births in the north and the slower rates of postponement and recuperation in southern Italy, where fertility has continued to steadily decline until the present. Nonetheless, the positive influence of immigrant births

on the overall fertility rates has diminished in time despite the increasing numbers of foreigners entering Italian soil.

Notwithstanding different timing and paces of fertility decline, the two macro-regions have in common that the evolution of fertility is led by higher educated women both in periods of decline and recovery (Impicciatore & Dalla Zuanna, 2017). Well-educated women are the first to postpone childbearing, to decrease their family sizes and to even forego family building entirely. However, the influence of female education on fertility changes according to territorial differences. The negative correlation between level of education and first births is stronger in the south (Impicciatore & Dalla Zuanna, 2017). The transition to second birth is heavily linked with regional residency, as women in the north are much less likely to have a second child than southern women (White et al., 2007). With regards to higher order births, Impicciatore and Dalla Zuanna (2017) observe a positive educational gradient for third births in the north, while well-educated southern women do not seem to be more likely to have a third child according to their higher educational attainment.

In short, the Italian fertility decline has been characterized by territorial differences originating from the extremely diverse social, cultural and economic environments present at local level over the whole Italian territory. As for numerous other domains, a geographical approach must be included in analysis of fertility behaviors to ensure that interesting and significant events are accounted for. During the last 65 years, fertility rates have consistently declined in the south, whereas northern fertility levels have fluctuated more, thanks to economic and even demographic factors that allowed a modest recovery. Nowadays, fertility rates in the two macro-regions have stabilized at approximately the same low levels. While a detailed regional analysis of fertility rates goes beyond the scope of this section, it must be anticipated that high variability is observable even within the macro-areas considered in this analysis.

2.1.4. The expansion of education in Italy

As anticipated, women's educational enrollment and attainment has had a remarkable effect on their attitudes and behaviors with regards to fertility in Italy, as in other low fertility countries. The weight of female education on educated Italian women has been considerable as early as the expansion of elementary education at the end of the 19th century. In time, its influence has grown along with the opportunities available to women to achieve higher educational outcomes. In particular, higher education has largely contributed through several dynamics to declining birth rates over the last decades.

Education was one of the first topics tackled from 1859 onwards by the government of the newly established Italian state. A standardized and uniform educational system at national level was

considered key to the strengthening of a common Italian conscience and society, extremely fragmented throughout modern history. At the time of unification, three quarters of the population were illiterate (Ballarino et al., 2014). In 1861 the Casati law (1859) declaring compulsory primary education was extended to the entire Italian territory, representing a first step towards the creation of a uniform national school system and providing for two biennials of primary education, two phases of secondary education, either "classical" (*ginnasio* and *liceo*) or vocational (*scuola tecnica* or *istituto tecnico*), and university education (whose offer in terms of subjects and degrees was enlarged beyond theology, law and medicine). With further reforms and provisions, the attendance rates gradually increased at most levels of education and, notably, female educational attendance and attainment rose (for instance, in 1874 women were permitted to study at universities).[26]

The (male and female) cohort born in the 1930s was the first generation to benefit from the more recent and extensive phases of the educational expansion in Italy. During the 1920s, the fascist regime had implemented the Gentile reform to reinforce the elitist character of the Italian school system and to strengthen the corporatization of Italian society. These provisions were withdrawn in the late 1940s, when the joint effort of the young democratic parties (including the remarkable influence of socialists and communists) reformed the educational system towards more equal opportunities, breaking with the stratified education of the fascist tradition. Twenty years later, the de-stratification process was extended to secondary education and school attendance was made compulsory until 14 years of age. More notably, in 1969 university education was made accessible to all students that had completed five years of secondary education (from *licei*, as before, as well as technical and professional schools) and passed a national exam (*maturità*), abolishing the previously in place selective barriers to entry to university. During the 1970s, further school reforms were discussed but only partially implemented due to political instability. Discussions of educational expansion shifted toward an increased decentralization of higher education in the following decades (1980s-1990s), with rising autonomy granted to the single universities on the educational offer. This reform process allowed for the inequalities in educational outcomes present in the Italian school system since the fascist period to markedly decrease (Ballarino et al., 2009).

Territorial differences between northern and southern Italy can also be observed throughout the expansion and modernization of education overtime. Spatial heterogeneity across the Italian peninsula have been the object of the national political discourse since the early days of the unification at the end of the 19th century.[27] The strong territorial differentiation in the economy, infrastructure,

[26] University attendance rates stagnated until the first post-war period, when it became more accessible to other students beyond the Italian elite.

[27] The sharp divide between northern and southern Italy was named the "southern question" by the current political and cultural discourse. Today it continues to be one of the primary issues that the Italian government must address.

resources and geography that became known as the North-South divide shaped some of the educational differentials in terms of fertility across the country. For instance, in the 1950s there was a huge gap between secondary schooling participation in the south compared to northern Italy, a divergence that seems to have grown overtime until the early 2000s (Ballarino et al., 2014). Therefore, despite the educational expansion and the governments' multiple efforts to align the educational system and outcomes of northern and southern Italy in the 20th century, several differences continue to persist today between the two macro-regions, especially at low and middle levels of education. On the contrary, higher education seems to be more homogenous across the country (Ballarini et al., 2014).

The expansion of higher education has been a long process in Italy. The 1969 reform granting access to higher education to all high school graduates was the first major attempt at converting an elitist institution into a source of mass education. Despite the reform, at the end of the 1980s the graduation rate was still remarkably low compared to other European countries, with less than one third of university attendees getting a degree (Bratti et al., 2008). Consequently, the 1990s were characterized by the attempt to increase the supply of higher education according to principles of autonomy and devolution mirroring the larger European reforming movement, the "Bologna Process". Universities began widening the offer of degrees and opening new branches in neighboring cities, some pushed by government provisions.[28] Southern universities were granted larger monetary resources to invest in their infrastructure and to accept higher numbers of students.[29] The geographic concentration of higher education sites decreased, allowing more high school graduates to attend university courses and increase their human capital, as it was not necessary to move to different cities as often as before.[30] Finally, the university curriculum was split according to a "3+2 model", providing for a 3-year bachelor degree (*laurea di primo livello*) and a 2-year master degree (*laurea specialistica*) to attract high school graduates willing to continue their studies for a shorter period of time. Such reforms had the intended positive effect on the enrollment rates across the country, especially on youth with less fortunate backgrounds, contributing to the overall higher education expansion in Italy (Cappellari & Lucifora, 2009; Di Pietro, 2012).

Women have largely benefitted from the educational expansion. They were first allowed to attend higher education in 1874 but the earliest available data on female university enrollment are from the 1911-1912 academic year. Since then, the number of female university students has risen and has

[28] In 1996, the Italian government passed a budget law for the following year including a provision requiring the largest universities to split into two (*Law n. 662 23/12/1996*). New university sites opened in the major Italian cities or were created in smaller urban centers as branches of the largest universities, greatly increasing the territorial supply of higher education.

[29] According to the development plans of 1991-1993 and 1994-1996.

[30] The number of Italian universities doubled in one decade (1990-2000) reaching a total of around 200 sites offering higher education (Bratti et al., 2008).

even exceeded male students in 1989 (**Figure 4**). Today, there are more highly educated women than men in Italy (**Figure 5**). The rising numbers of well-educated women have contributed to shape modern society, in cultural, economic and demographic terms. Education increases the job attachment of women, who perceive their occupation not only as a source of income and economic independence but also as a means to self-realization and self-fulfillment (Bratti, 2003; Lesthaeghe, 2014). Expanding education stimulates the change in taste and attitudes towards of their traditional female-caregiver family role, as well as the possibility to pursue alternative and more appealing life paths. In a self-reinforcing cycle, these changing perceptions spread and increase the demand for higher education (Lesthaeghe, 2014). The knowledge and skills acquired in higher education are likely to facilitate women's entry into the labor force and to win them higher wages and fulfilling careers. Therefore, as well-educated women tend to also be more attached to the labor market and their professional career, Italian female labor force participation has increased overtime especially among better educated women (Minello, 2024). From a demographic perspective, rising levels of female education have encouraged the transition to late childbearing and lower achieved fertility due to first birth postponement at earlier ages and have thus contributed to the overall fertility decline.

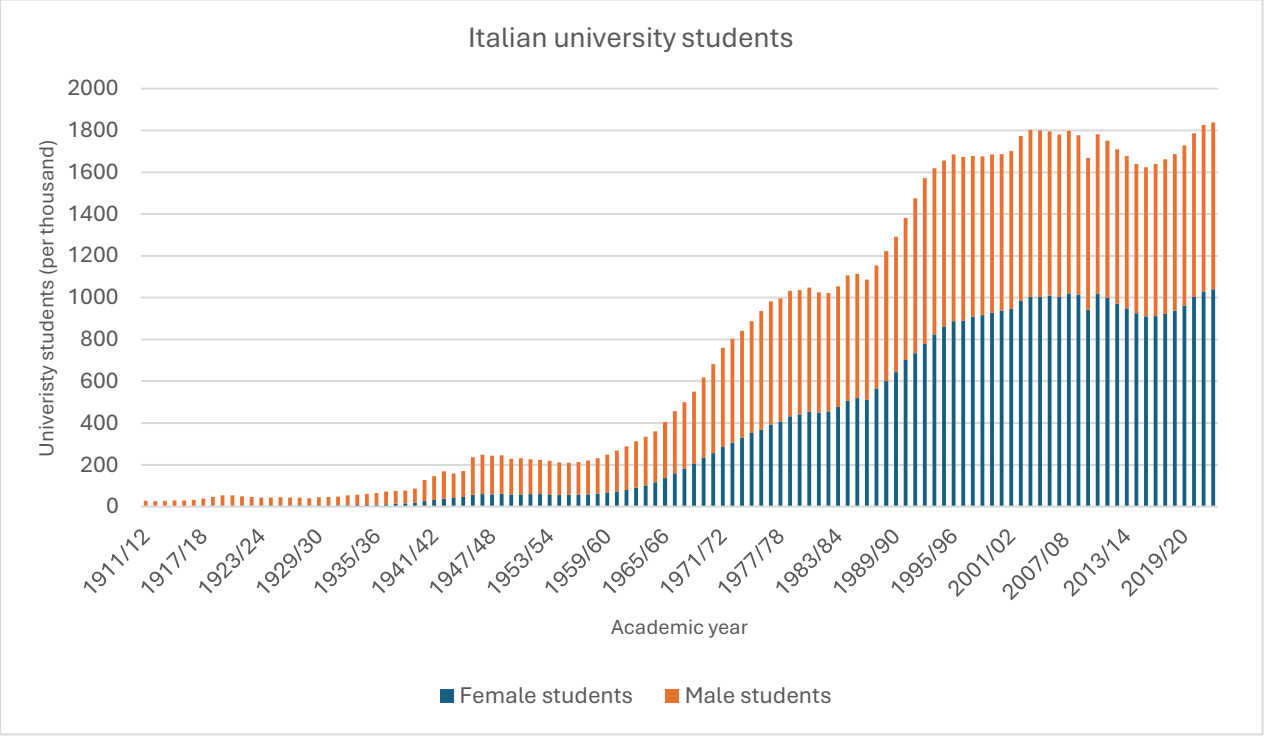

Figure 4. Number of university students per academic year (1911/12-2022/23). Italy. *Own elaboration of Istat data (2024).*

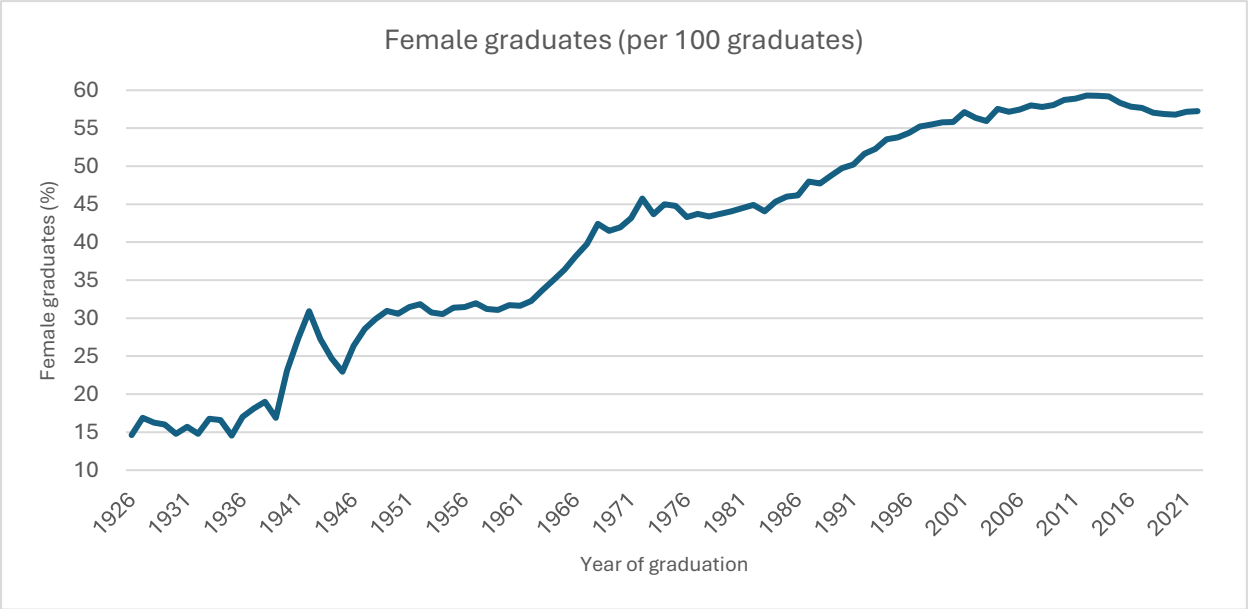

Figure 5. Number of female graduates per graduation year (1926-2022). Italy. *Own elaboration of Istat data (2024).*

2.2. The contextual factors affecting the influence of education on fertility in Italy

As stated in the previous Chapter, fertility attitudes and behaviors must be considered within the contextual framework where individuals live and from where they build their preferences and aspirations. Therefore, this Section intends to paint the larger picture in terms of the social, cultural, economic, political features of the Italian state providing the contextual explanation of fertility behavior of Italians. These elements constitute the "delay syndrome" of Italians, as each step from the transition to adulthood towards fertility after completing education is postponed due to unfavorable contextual factors (De Rose et al., 2008, p. 689).

The first section presents the Italian cultural and social environment where the role of women and the family and the value of children are first constructed (Section 2.2.1). The second one describes the Italian labor market structure, characteristics and obstacles to fertility, with a focus on women's opportunities and barriers to their professional development and to childbearing (Section 2.2.2). Finally, the last section discusses the Italian welfare state in terms of fertility protections and incentives by mentioning the main policies targeted at contrasting the fertility decline (Section 2.2.3).

2.2.1. Social and gender norms

Fertility originates from and within the family. In the Italian society, the family has long been a stable institution holding a central role in society, especially with regards to fertility. Contrary to other

European states, the Italian family acts as an informal support network providing care services that are usually beyond family competences and capabilities. While elsewhere it is the state that offers support to the family, in Italy this is the family's responsibility. Care for children and elders is usually provided within the single-family network, as a strong sense of belonging and duty towards family members is widely spread among Italian society. It is the family members that take it upon themselves to care for their kin with both material and emotional support. It follows that, as these services are already provided by an informal network, the state has not needed to fulfill this task. Indeed, the Italian welfare state does not offer extensive assistance to the family, contrary to many other European states.[31] In other words, the Italian society is characterized by the so called "familist" culture.

In accordance with the familist system, children are greatly supported by parents until well into their adulthood.[32] Italian parents invest big amounts of both financial resources and time in their offspring's life. An Italian family spends around 645 euro per month per child, for a total of around 140.000 euro over the first 18 years of life (Rosina, 2021). On one hand, this has led parents to build their families according to the quality-quantity trade off, with a lower number of children who are in turn granted higher investment from the parents. On the other hand, this trend reflects the necessity to adhere to familist norms, as young Italians do not have the means to be independent from their family until long after they are legally adults (European Parliament, 2024). Family ties remain a strong feature of the individual's life from early childhood to adult years. Italian children tend to stay at the family home even in their adulthood, usually until they marry or start cohabiting with their partner.[33] Even then, they tend to live close and maintain strong ties with their family of origin.

The roots of Italian familism are found in the traditional gender norms and attitudes that pervade the Italian society. The social foundation of Italian society is the male-breadwinner and female-caregiver paradigm, which sees the woman mostly in charge of the family within the private sphere, and the man as the provider that engages more often with the public sphere. The male earner partner works to provide for the family; the woman, whatever her occupation status, has the responsibility of raising children, caring for elders and taking care of the household. The expectations and duties associated with this kind of social role for women are independent from age; for example, grandmothers take care of their grandchildren more often than their male counterparts (Istat, 2022). This social paradigm foresees a very straightforward division of labor, both within and outside the household. Such division

[31] The Italian system of welfare protections and benefits is described in detail in Section 2.3.3.

[32] The strong familistic ties among family members and, in particular, between parents and their children persist even after the offspring leaves the nest, both in an emotional and a concrete sense (Santarelli & Cottone, 2009).

[33] In Italy, this phenomenon is also strengthened by the very low-income levels, the instability in the job market and the inaccessible house price market. accordingly, young people are forced to postpone purchasing a house until they can share the costs with a partner, or they have accumulated enough resources to buy a property (see more in Section 2.3.2). In other cases, it is the parents that buy the house for their children – another display of Italian familism.

of labor starts as early as in the parenting house, where daughters tend to do more housework compared to male children in support of their mothers (Mencarini et al., 2010).

While these norms have been challenged by rising female labor market participation and emerging gender egalitarianism, the recognized and shared gender attitudes are still strongly linked to the traditional paradigm. In fact, although dual-earner families with working wives and mothers are becoming more common, the female partner is still expected to care for the household and children (as well as other family members) when she gets home from work (often referred to as second shift). The matter is further complicated by the fact that a full-time workday is much longer than the typical school day, as society at large is often organized on the assumption that mothers are housewives and caregivers. Such societal order reinforces the widely shared negative perception of mothers that are employed and their feelings of guilt originating from having to balance their work and their family lives (Minello, 2024).[34] In short, social norms reflect the strong work-family conflict experienced by Italian women.

Despite recent social change, in Italy the gender revolution has not been completed; women still experience high inequality constraints compared to men in several life domains. From the point of view of education and fertility, this translates in negative educational gradients across the whole country, especially in the case of first births (Impicciatore & Dalla Zuanna, 2017). In particular, southern Italy has a lower level of gender equity which reinforces the negative educational gradient. Southern men and women both hold conservative attitudes on the role of the woman in the household as a mother and wife (Dotti Sani, 2012). One implication is that southern well-educated women do not diminish their share of household chores according to their educational attainment, in contrast to northern women (Dotti Sani, 2012). On the contrary, a slight improvement in egalitarianism can be noticed in northern areas, where gender roles within well-educated couples are shifting towards a more gender-equal balance in terms of household management and childrearing (Impicciatore & Dalla Zuanna, 2017).

The strong familistic culture and the diffused gender norms might be able to alter the correlation between education and fertility that can be observable in other countries. While higher education often translates in an ambitious career-oriented woman, in such a familistic environment well-educated women might give up their personal or career ambitions in favor of the family if their family proneness prevails. A well-educated woman might still refer to her family-oriented preferences and give up her academic or professional career in order to fulfil them, as her priorities in terms of family-building and children might remain unchanged despite their education level and potential opportunities (Matysiak & Vignoli, 2013 in Impicciatore & Dalla Zuanna, 2017). Such tendencies

[34] In a report from 2024, eight out of ten Italian women with children feel guilty for having a career (Minello, 2024).

might be more present in the south of Italy, where the familistic and traditional norms are generally stronger.

2.2.2. The labor market

The Italian labor market structure and its characteristics represent a substantial obstacle to childbearing across the peninsula. Historically characterized by a rigid structure, the labor market has recently undergone considerable and radical change in Italy. Rising levels of unemployment among men at the end of the millennium pushed Italian government to act after decades of, among others, very low female labor participation and difficult entry into the labor market for young people (Istat, 2020). A series of reforms between 1993 and 2014 inaugurated a dualization process through which the Italian labor market *de facto* became a dual labor market where newcomers are often under temporary contracts and enjoy significantly less protections than existing employees (Hoffman et al., 2022). It follows, the most affected by the labor market dualization were the younger generations and women (female labor participation rates grew from 48% in 1967 to 67% in 2016) who were hired during or after the implementation of such reforms (OECD in Hoffman et al., 2022).

The dualization measures were part of the governments' plan to adopt flexibilization policies in order to alter the rigid structure of the Italian labor market. The increased labor market flexibility was implemented through market deregulation that targeted employment protection legislation to boost employment rates and productivity growth, in response to high unemployment. The Italian government, among other measures, promoted the introduction of atypical and flexible work (or temporary) contracts since the late 1990s (Pieroni et al., 2023). These labor market deregulation policies, however, have not created additional entry level positions or increased occupation rates; on the contrary, they have resulted in the substitution of secure job positions with cheaper and insecure employment (Barbieri & Scherer, 2009; Hoffman et al., 2022). Therefore, while these policies reduced the rigidity of the Italian labor market, they also considerably raised its levels of insecurity and instability. Barbieri and Scherer (2009) found that these measures hurt the most the better educated, whose entry into the Italian labor market has become neither easier or faster after the implementation of such policies.

Notably, the growing use of temporary contracts is one of the sources of current employment instability in Italy. They generally offer low wages and little to no social protection accompanied with discontinuous careers and high levels of insecurity because of their limited duration. Fertility intentions and achievement of Italian couples suffer the negative implications of such precarious working arrangements. Job instability originating from precariousness affects their quality of life, economic security, ability to plan future choices, and forces a delay of fertility decisions (Pieroni et

al., 2023). Well-educated women are the most affected by the negative consequences of temporary employment on fertility; in particular, the transition to first birth in the first five years since they entered the labor market is significantly reduced (Guetto et al., 2023).

In addition to instability and insecurity, while nominal wages may seem to have grown, real incomes have stayed the same for the last thirty years in Italy (Istituto nazionale per l'analisi delle politiche pubbliche [Inapp], 2023). Wage stagnation, in terms of fertility, represents a crucial obstacle to family formation and childbearing due to difficulty of young Italians to achieve financial independence first, and residential autonomy later. In fact, the economic resources available to many young individuals are not sufficient to leave the parental home and buy a house, a prerequisite in the transition to adulthood and family building in the Italian peninsula (Vignoli et al., 2013). This difficulty stems from the limited and insecure monetary resources to invest, first, in housing accommodation. Both purchasing and rental costs in Italy have risen overtime, as opposed to wages and precarious employment rates (European Parliament, 2024). Therefore, young Italians might avoid investing in residential independence if it increases their poverty risk, often resulting in not leaving the parental household (Sironi & Rosina, 2015). Apart from the housing issues, present incomes constitute an overwhelming obstacle in the transition to family formation in terms of raising children. Most Italians' salaries then are not sufficient to raise a family.

Poor labor market conditions are especially felt by women and the level of female education affects the correlation between employment status and fertility behavior. First, the entry into the labor market is particularly difficult for Italian women and it has been proven to be a structural obstacle to the transition to first birth and a major cause of both voluntary and involuntary childlessness (Tanturri and Mencarini, 2008). Later, when they get hired, women's occupations are on average more unstable, less paid and less likely to be permanent contracts (Minello, 2024; Ghiselli, 2022). Career advancement is also more difficult for women and the managerial positions occupied by women over the country are notably few (Minello, 2024). Finally, they might feel that the stability of their occupation is conditional to whether they want to have children. In the case of higher educated women, poorly paid or insecure employment positions cause further delay of the transition to first birth. On the contrary, less educated women in the same position are more inclined to enter motherhood and step into a more traditional gender role, as they tend to consider childbearing as an alternative to being employed and have the least to lose in putting aside their professional life (Barbieri et al., 2015; Wood & Neels, 2017; Guetto et al., 2023).

The above labor market penalties for women and, in particular, for working mothers could partly explain why the Italian female labor participation rate (**Figure 6**) has long been significantly below the European average (Minello, 2024). The number of working women was low in the 1960s and

grew from the 1970s onwards, when the Italian economy shifted towards a more industrial rather than agricultural production and women began to be employed in the manufacturing and tertiary economic sectors (Fanti et al., 2023; Istat, 2020). Today, the highest shares of working women are employed by the service sector, more specifically in education, healthcare and social work (Minello, 2024). Female labor participation varies in the south compared to northern Italy (it is higher in the latter), in compliance with the historical economic divide between the two macro-areas. Different paces and degrees of industrialization differentiated the sectoral and productive capacity of the two regions, while economic downturns and inequality drivers, such as asymmetries in the labor market, in the wage and wealth distribution, and in the levels of investment have widened the gap (Fanti et al., 2023). This territorial divide could be also partly due to factors outside the local functioning of the labor market, such as the different welfare and policy provisions in place in the two Italian macro-areas (Fargion, 2013). As argued by Fargion (2013), the territorial divide in terms of social citizenship and welfare provisions has not been bridged; on the contrary, it might have widened overtime.[35] This and the difficulties encountered by women on the Italian labor market further complicate the reconciliation of professional career and family responsibilities, especially in the southern regions, where women are even more disadvantaged.

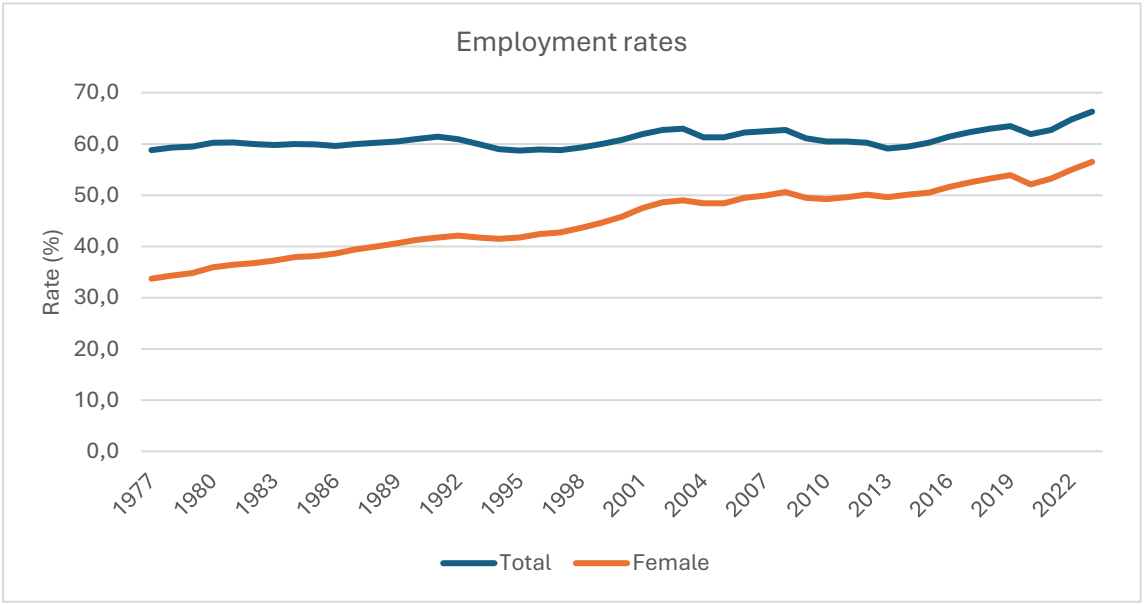

Figure 6. Total and female employment rates (1977-2023). Italy. *Own elaboration of Istat data (2024).*

Italian women have to adapt to the labor market and find strategies to more easily abide by their gender roles as wives and mothers. To better reconciliate family responsibilities and professional

[35] The different fertility policies in force in the country are discussed in the following sub-paragraph, Section 2.2.3.

careers, it has been suggested that part-time work in Italy could represent a feasible solution to childrearing, especially in terms of time spent with children (Del Boca, 2002). Part-time working hours allow more stay-at-home time and better align with how the rest of the Italian society is organized; for instance, the school day is more compatible with a mother working part-time. Alternatively, an occupation in the public sector, such as education and healthcare, might help women in reconciling both roles, as they grant more flexibility and longer leaves (Minello, 2024). Another means through which Italian couples overcome the incompatibility between childcare services availability and their occupation is the support of the extended family, or more often, grandparents. As per the familist nature of the Italian state, care responsibilities are managed by the family itself and grandparents' support has become a crucial aid to parenthood, with more significant effects than formal childcare on fertility (Del Boca, 2002).

The peculiar rigidity of the Italian labor market has contributed to curtailing the number of births both by raising women's opportunity costs for having and rearing children and by hampering the entry and permanence of women in the labor market, especially when they are or intend to become mothers. More recently, temporary contracts, stagnant wages and unstable employment have further complicated the transition to parenthood. Taking this into account, the low number of births in Italy can be linked to low female labor participation and high female unemployment (Wesolowski & Ferrarini, 2018). To raise fertility levels, an intervention to remove the labor market obstacles to the transition to parenthood, especially those encountered by women, is required.

2.2.3. Welfare and policies

The welfare system is yet another variable affecting the behaviors of Italians when they choose to build a family and have children. In Italy, the system and the welfare provisions concerning the fields of fertility, childcare and support to families are strictly related to the broader social and cultural environment, in particular in terms of familism and of gender norms. Care responsibilities, both towards children and the elderly, are thought to lie with the family, an assumption that is reflected by the Italian welfare institutions. As childcare is seen as a prerogative of the domestic environment, public care services are notably scarce. The tax system tends to disfavor families; child and household benefits are low compared to other European countries. Most welfare provisions benefit the older population: in 2021, 7.1% of GDP was spent on pensions, while only 1.2% was spent on family-children benefits (Eurostat, 2024a; 2024b).

The enlargement and improvement of the Italian welfare system is hindered by several factors beyond the familist nature of the Italian society. The current welfare state in Italy has no strong and coherent foundation, as the end of corporatism did not give way to a new welfare model (Trifiletti, 1999).

Moreover, the pro-natalist tradition of Fascist Italy has resulted in the inability to discuss this type of fertility policies without uncomfortably referring to fascist administration. After a period of extensive expansion of welfare benefits and protections in the 1970s, the Italian welfare system has entered a phase of financial and structural crisis that still today does not allow wide margins of maneuver and reform (De Rose et al., 2008).[36] The numerous welfare deficiencies increase the opportunity costs faced by Italian women and heavily affect their willingness and capability to start a family and have children. In the absence of substantial help from the state, they must rely on stable employment to be able to sustain the large expenditures foreseen to raise a child. As a result, the Italian environment obliges women, especially the well-educated, to postpone motherhood to maximize their professional and economic security (Barbieri et al., 2015). However, as argued above, the Italian labor market does not efficiently provide the opportunities and resources necessary to improve women's chances at childbearing.

De Rose et al. (2008) grouped existing family policies into four main categories: those providing direct (monetary and income transfers) or indirect (fiscal and tax deductions) financial support; social policies reconciliating the professional and family dimensions of life (such as parental and maternal leave); family-friendly labor market policies; childcare services. Among the Italian care services, the 2022 Family Act has widened the scope of existing policies and has introduced new measures in support of Italian families. The *assegno unico e universale* is disbursed to all Italian families with children according to their income level (*Law n. 232 21/04/2021*). The *bonus mamme* (tax deduction) exempts three-child families from the payment of social security contribution (*Law n. 213 30/12/2023*). The *bonus asili nido* allocates a money transfer to cover the costs of infant childcare services for families below certain income thresholds (*Law n. 232 11/12/2016*). However, despite directly intervening on the direct (and indirect) costs of childbearing, the last-mentioned may not be the best strategy to raise fertility levels in Italy. A recent study has found that formal childcare services do not exert significant influence on the fertility choices of Italians and the positive effects are limited to few socio-economic groups, namely on less educated and, presumably, less well-off individuals (Scherer et al., 2023).

Family policies targeted at reducing the conflict between work and family are associated with higher female labor force participation and higher fertility (Wesolowski, K., & Ferrarini, 2018). Formal childcare services cover all ages, as the state supplies services for infants (*asili nido*) and children above the age of 3 (*scuole materne*) before they enter primary school. However, these services are unevenly distributed across the Italian territory and there is a significant gap in the number of

[36] The Italian 1970s saw a remarkable expansion of public services (national health system, nursery schools, family-planning services), the removal of legal prohibitions (divorce and abortion were legalized) and other significant steps in the development of the welfare system (legal equality between husband and wife, equal gender opportunities in the workplace).

childcare centers between the north and the south (Scherer et al., 2023). This is one of the factors determining a lower level of trust the formal and political institutions in southern Italy, which further decreases fertility in the macro-region (Aassve et al., 2016).[37] Parental leave can last 6 to 10 months (except for specific cases, when it can be extended to a total of 11 months) and it has recently become more well-paid (80% compensation instead of 60% for the first three months of leave; *Law n. 207 30/12/2024*). Finally, the very recent *Codice per le imprese in favore della maternità* (2023) advises businesses against interrupting the careers of new mothers and preaches business adaptability and flexibility in terms of working hours, longer parental leaves, smart working, and supply of kindergartens and domestic assistance. However, the adoption and potential effectiveness of this initiative are conditional to the voluntary compliance of businesses and companies, as these measures do not have a binding nature but are mere recommendations.

More recently, the Italian government has approved two crucial documents partly concerning the issue of decreasing fertility in the country, introducing new measures or reinforcing those already in place. The Medium-term Fiscal-Structural Plan for the years 2025-2029 intends to strengthen family policies in support of childbearing and parenting by reducing the weight of the work-family conflict for women; by bridging the gender gap in educational outcomes and the labor market, facilitating women's entry, improving their working conditions and their social security; by widening the offer of childcare services (Ministry of Economy and Finance [MEF], 2024b). In addition, the 2025 Budget plan, in view of the Fiscal-Structural Plan, implements a monetary transfer (*bonus bebè*) for each born child, longer paid parental leaves and a tax relief (*bonus mamme lavoratrici*) for working mothers; however, all benefits are only accessible to lower-income families (MEF, 2024a).

Whether these policies will have a positive return on fertility remains to be seen but it is possible that their contribution will be limited. For one, most policies are only beneficial to less fortunate families, excluding well-off and well-educated women that are likely to bump into higher opportunity costs of childbearing. Moreover, other benefits (for instance, the tax relief) are only accessible to women with permanent contracts, who are generally more protected by the contract itself compared to women working under temporary arrangements. Finally, measures to increase the accessibility of childcare services will not be as successful as it is hoped if full-time and opening hours flexibility are not implemented.

Considering Italian welfare and policies, the attempts of governments to address the persistently declining fertility levels have failed to identify the target and have proved mostly unsatisfactory until today. Most of the welfare support and protections are still reserved for aged social strata that do not have an impact on the number of births. The young generations should be acknowledged as a public

[37] In Europe, the level of trust in state institutions is positively associated with fertility levels (Aassve et al., 2016).

good and a source of growth, and an effort at improving youth's security, protections and opportunities should be made to enable young Italians to achieve their fertility goals. In particular, both institutional and structural changes are needed for political measures to have an effect on the fertility behavior of Italian women. Italian policies need to be designed to address the difficulties of young men and women entering the labor market and making the transition to adulthood and parenthood, to improve women's chance at reconciliating their role as mothers and workers, while also supporting parents and families at large.

2.3. Generational changes in the relationship between fertility and education in Italy

The following sections provide an overview of the changes in the relationship between fertility and education across three generations, with a specific focus on women. The cohorts of women considered were born in the 1960s, the 1970s and the 1980s, therefore it can be presumed that they have all completed their studies and have reached or are reaching the end of their reproductive window today.[38] The analysis is based on data gathered by the multipurpose survey *Famiglie, soggetti sociali e ciclo di vita* (FSSCV) conducted by Istat in 2016 and published in 2020. The survey was carried out to develop statistics on individuals and families in several fields, among which intended and achieved fertility, education, occupation, career and others. In particular, I use a sample of women born in the span of 5 years per each decade considered (1962-1966, 1972-1976, 1982-1986), for a total of 3,149 Italian women, of whom 799 have graduated from a higher education institution. Despite the relatively small sample, it is still possible to make observations regarding the interplay between fertility and education for these cohorts of women.

The first section describes the fertility attitudes and behaviors of women born in the 1960s based on their educational attainment (Section 2.3.1). The second section contains a similar analysis but shifts the focus to women born in the following decade (Section 2.3.2). Finally, the third and last section attempts to capture the fertility behavior of women born in the 1980s in terms of female education (Section 2.3.3). However, it must be taken into account that the FSSCV survey was conducted before the women born in the last two decades could reach their 50th year of life, which is usually considered as the last fertile year for women. In other words, while some conclusions can be drawn on all three cohorts' fertility behavior, achieved fertility can only be calculated for the 1960s cohorts (more specifically, women born between 1962 and 1966). Additionally, 1980s cohorts may not have reached the end of their reproductive window today, and thus they might have other children in the future

[38] The younger birth cohort considered was born in 1986; these women are currently entering their 39th year of life.

according to the phenomenon of fertility recuperation, beyond the time limitations of the year when the survey was concluded.

2.3.1. Generation 1: 1960s cohorts

The cohorts born in the decade of the 1960s are the so called "baby boomers". During those years, Italy experienced a significant economic expansion which benefitted in particular the northern, more industrialized regions and improved the living conditions of Italians while widening the range of life opportunities in several realms. Daily life and cultural paradigms changed with the arrival of new technologies, among which television, that will contribute to the mindset shift of the 1960s towards more openness and modernization. The dynamic occurrences of this decade also contaminate politics, with the social turmoil of the late-1960s, the end of centrism and the entry of leftist parties into government.[39]

The generation born in these years grows up in a changed, more open, richer Italy where economic and cultural modernity is finally growing roots. Tradition is making way for new habits and longstanding customs are becoming old-fashioned. A set of new and modern emerging aspirations and attitudes towards life and family, and the perception of how to reach self-fulfillment all represent a social break from the past. Evidently, women's values, ambitions and their perspective on becoming mothers reflect such changes.

Education

The female cohorts of the 1960s attended education significantly more than women born in previous decades. Women were enrolled for longer time and were reaching higher educational levels, starting to fill the gender gap in higher education especially. For this cohort, the share of low educated women who had not completed high school education fell considerably to around 40% (compared to 74% for women born in the 1940s) (Impicciatore & Dalla Zuanna, 2016). On the contrary, the number of well-educated women who graduated from a university rose to 17%, despite moderate territorial differences between northern and southern Italy in terms of educational attainment (**Table A**).

The growing numbers of university graduates among women, along with the broader cultural and social changes, sparked a rise in female labor participation in the 1960s cohorts. Considering women as figures relegated in the house to take care of children was becoming outdated and was being replaced by the idea of an emancipated and independent woman who could have ambitions outside becoming a wife and mother. Thus, an increasing number of 1960s born women considered their

[39] Italian centrism refers to the political strategy adopted by the biggest Italian party, *Democrazia Cristiana* (DC), in the aftermath of the Second World War (1947-1962), characterized by coalition governments between the DC and other minor political parties of the center while isolating the parties at the margins (more specifically, the leftist Socialists and Communists). Such pact collapses at the beginning of the 1960s, where the Socialists finally join the governing coalition.

professional career as a worthwhile source of self-actualization or even as an alternative to childbearing. Consequently, it was more common for the 1960s cohorts to be working compared to their predecessors. In particular, the expansion of the services sector in the 1980s facilitated a growing entry into the labor market for women who made up a large share of workers in this sector (Istat, 2020). On the other hand, the levels of female unemployment for women born in this decade remained high and even exceeded 20% in the southern part of Italy (Istat, 2020).

Table A. Distribution of women by macro-area and education. Italian women born in 1962-1966. *FSSCV.*

Table A Distribution of women by macro-area and education. Italian women born in 1962-1966. *Source:* Istat FSSCV (2016)

	Distribution of women (%)		
	Italy	North & Centre	South (Mezzogiorno)
Lower	83.00	81.27	85.87
Higher	17.09	18.73	14.35
N	1188	742	446

Fertility behavior

When it comes to female fertility behavior, 1960s born women played a major role in the decline of fertility unfolding in Italy. The average age at childbirth increasingly rose from below 26 to around 29 in the span of 10 years, a symptom of the ever-growing tendency to delay entry into motherhood (**Figure 8**). At the same time, the number of children per woman decreased and, most notably, second, third and higher order births became less and less common (**Figure 7**).

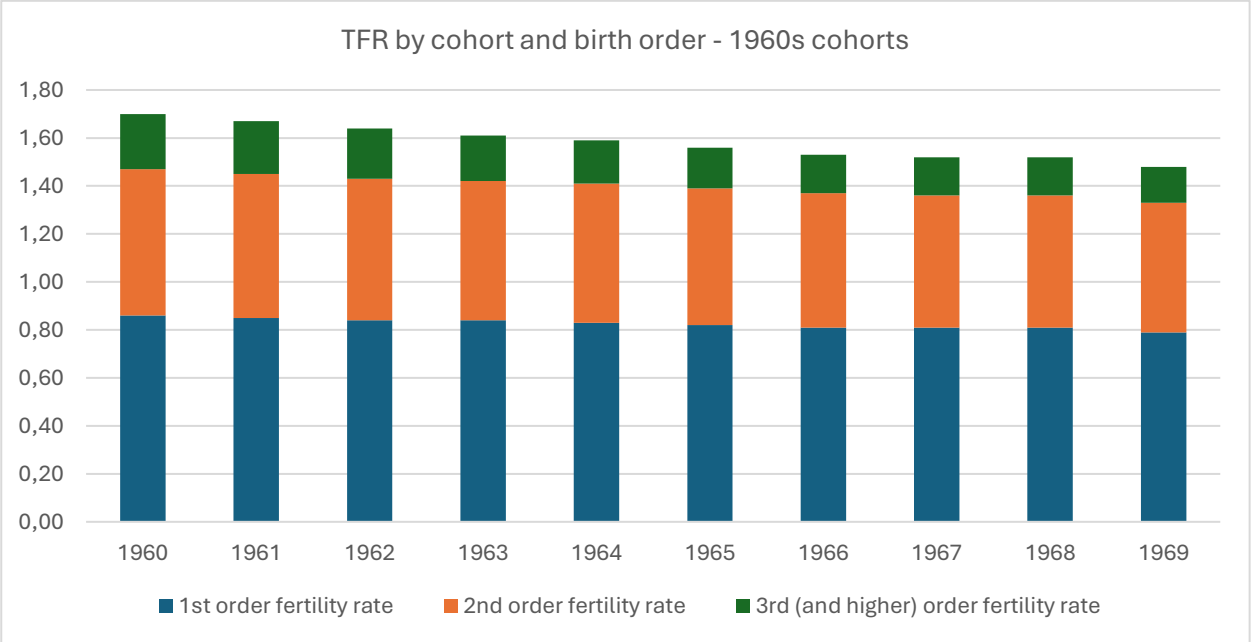

Figure 7. TFR by cohort and birth order. Italian women born in the 1960s. *Own elaboration of Istat data (2024).*

Variable interplay: education and fertility

Table B describes the fertility behavior of well-educated women born between 1962 and 1966 interviewed in 2016 by Istat (FSSCV). Their TFR reaches 1.49 points which falls below the TFRs observed for all 1962-1966 born women (according to **Figure 7**, it varies from 1.64 to 1.53 in those years); as expected, well-educated women have a lower achieved fertility compared to the entire population. While the probability of having two children is fairly high (around 1 in 2 women have at least two children), their propensity to have a third or higher order birth decreases significantly (from 0.70 and 0.48 for first and second births to 0.10 for third births), as less than 10% of women go on to have a third child.

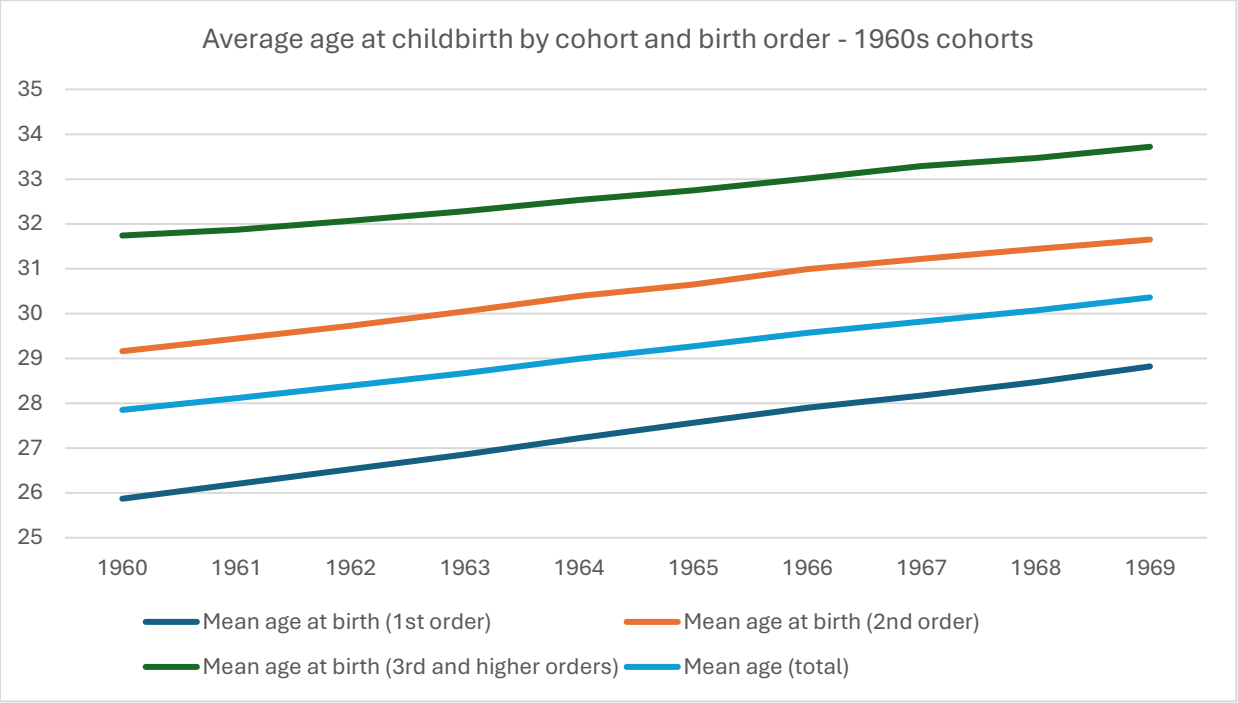

Figure 8. Age at birth by cohort and birth order. Italian women born in the 1960s. *Own elaboration of Istat data (2024).*

Table B. Fertility of well-educated women. Italian women born in 1962-1966. *FSSCV.*

Table B Fertility of well-educated Italian women born in 1962-1966. *Source*: Istat FSSCV 2016

	0	1	2	3	4+	Total	
Women by number of children (N)	62	44	78	17	3	204	
Women by number of children (%)	30.39	21.57	38.24	8.33	1.47	100	
Women with at least *j* children (N)	204	142	98	20	3	-	
Women with at least *j* children (%)	100	69.61	48.04	9.80	1.47	-	
Children by birth order (N)	-	142	98	20	43	303	
Children by birth order (%)	-	46.86	32.34	6.60	14.19	100	
Probabilty of having a child of order j (parity progression ratio to j = PPRj)	-	0.70	0.48	0.10	0.01	**1.49**	**(TFR)**

For this generation, the influence of education on fertility was embodied in the tendency to postpone life events and transitions. First, the traditional life course of events according to which women would get married, leave the parental house and start a family in this order was revolutionized. On one hand, entering adulthood in terms of residential independence moved to later ages in a decoupling between the transition to adulthood and age against the traditional and standardized age norms for leaving the family of origin (Santarelli & Cottone, 2009). As a consequence, Italians born in the 1960s were still living at home thirty years later and the mean age for leaving the parents' home was the highest in Europe (Aassve et al., 2001; De Sandre et al., 2000). At the same time, also the mean age at marriage started to rise, with 47% of 1960s born women aged 25-29 years old had never entered a union (Billari & Rosina, 2004).

On the other hand, a trend breaking with tradition appeared, where the previously simultaneous events of leaving the parental household and getting married stopped being synchronous. In particular, an increasing number of women in northern Italy left the family home before marriage.[40] Alternative ways of family-formation began to emerge and increasingly diffuse in these years. In the 1980s, the young 1960s cohorts had a favorable opinion of cohabitation, and a modest number of women had entered this kind of relationship with their partner without a previous formal union, especially in northern and central Italy (Billari & Rosina, 2004). However, a wider diffusion of the trend was hindered by the parents' negative perception of cohabitation and only around 15% of 1960s born women were cohabitating between the ages of 25 and 29. Although new ideas and norms were emerging and circulating during these years, adults' public perception of alternative unions to marriage was still reluctant to accept cohabitation as a respectable form of family formation.[41] Nonetheless, Rosina (2004) acknowledges that this birth cohorts widely considered cohabitation a prelude to marriage rather than a substitute of the formal religious and civil union, and that the popularity of cohabitation mainly derives from the difficulties encountered by young individuals in the transition to adulthood, in response to the need of greater flexibility.

A second delaying choice adopted by Italian women born in the 1960s was to postpone their transition to first birth. The tendency to postpone early motherhood had started with the women born in the 1950s, especially in the central and northern Italian regions. This behavior kicked off the ever-growing trend of first birth postponement, which became more and more common among the following generation. The 1960s birth cohorts were much more likely to delay their entry into

[40] In the South, for these birth cohorts the transition to adulthood and to residential independence remains strictly related to marriage. A delay in marriage results in a longer and indefinite stay at the parental house (Rosina, 2004).

[41] The modernizing effects of the 1960s social and cultural revolution are only observable in the behavior of the following cohorts born in the 1970s, whose parents were young adults during the 1960s.

motherhood until their 30s, which could partly explain the slight improvement in Italian fertility rates in the late 1990s (Billari & Rosina, 2004). However, differently from women from the 1950s, the 1960s cohort achieved first birth postponement through the use of modern contraceptive methods like the condom, the IUD and the pill (liberalized in the early 1970s).[42] The wider cultural and ideational revolution that characterized the second half of the 20th century caused changes in the sexual and marital behavior of young women born from 1960 onwards, who would increasingly resort to contraception as they were sexually active in their twenties (Dalla Zuanna et al., 2005). Consequently, the spread of modern and more effective contraception increased the ability of Italian couples to control marital (and rising extra-marital) fertility and decrease the number of unplanned births, strengthening the declining trend of total fertility.

Moving motherhood to later ages was made possible also by emerging attitudes toward women's participation in the labor market and what had been their traditional gender role of wives and mothers. With more and more of them joining the labor force compared to previous cohorts, 1960s born women were the first generation to develop a strategy for avoiding having to choose between their own career and personal ambitions and family-building. The life course of women became more flexible, allowing for a chain of events different from the traditional life path beyond marriage and family formation, for an easier reconciliation of life in different domains, such as career and family (Billari & Rosina, 2004). The changing social environment presented the chance for women to resolve the conflict between professional and family life by turning to unusual and modern approaches to life transitions. Rosina (2004) observes that the 1960s cohorts adopted a "diachronic strategy", resorting to the postponement of motherhood to pursue personal goals in favor of later childbearing recuperation.

Indeed, a trend of fertility recuperation at older ages emerged along with the postponement of first births as a strategy to compensate for delayed childbearing. A postponed entry into motherhood encouraged women to later make up for lost time, resulting in the recovery of fertility at later ages. Caltabiano et al. (2009) observe this phenomenon in northern and central Italy, where the number of births had by the 1960s and 1970s cohorts that had previously been postponed was recovered at least partially. In the south, such recovery is much slower and only noticeable starting from the mid-1960s birth cohorts.

The systematic postponement of first births has resulted in an increased number of smaller families (one-child families exceeded families with two children, which had been norm for previous generations) and of childless women among the same cohorts (De Rose et al., 2008). While

[42] Women born in the 1950s practiced the *coitus interruptus*, due to social and cultural rejection of modern contraceptives by the society, the medical culture and the catholic Church (Dalla Zuanna et al., 2005).

childlessness became noticeable among women from the 1960s compared to previous cohorts (in Table B, 30% of women from this cohort have remained childless), the number of childless women born in this decade was below 15%, a small share compared to other European countries (Caltabiano et al., 2009; Billari, 2008). According to a study conducted in five provincial capitals, the educational levels of these women were not directly affecting their choice in terms of voluntary childlessness; nonetheless, as more educated women from the sample were more likely to have cohabited with a partner and be working, and both circumstances were positively correlated with voluntarily foregoing children, education certainly had an indirect influence on those who chose not to have children (Tanturri & Mencarini, 2008). This group of well-educated women with less traditional value orientations can be considered the forerunners of childbearing postponement and foregoing, a trend that increased along with expanding female education for younger cohorts of women.

2.3.2. Generation 2: 1970s cohorts

Italians that were born in the 1970s came into, once again, a changing Italy. Means of communication such as the television and radio continued to play a role in diffusing and standardizing new ideas and emerging social behaviors. These social mechanisms, along with economic well-being, gave rise to consumerism, reinforced the feeling of mass society and sparked the emergence of new political and social debates. In these years, the outcomes of 1968 were addressed by the governing class through a series of measures in response to popular demands. In terms of family and fertility, several instances concerning the private realm were legalized, among which divorce (*Law n. 898 1/12/1970*), abortion (*Law n. 194 22/05/1978*) and equality between husband and wife (*Law n. 151 19/05/1975*). Nonetheless, the 1970s have also been characterized by a climate of violence and strong political turbulence due to the emergence of terrorist organizations aligned with right and left ideologies, while social movements promoting peace, openness and tolerance were simultaneously popular among the youth.

Education

Higher education enrolment stalled in the early 1990s, the years in which 1970s birth cohorts were supposed to enter universities by age, due to the fertility decline in births two decades earlier (Rossi, 2010). Nonetheless, the share of well-educated women continued to rise (from 17% in the 1960s to above 25% in the 1970s) and to have significant weight on the life course events of this generation of women (**Table C**). For one, education was positively correlated with female labor market participation, with female graduates being twice more likely to be employed compared to women with very low educational attainment (Istat, 2020). Higher education of 1970s women is also positively associated with attachment to the labor market and the possibility of having a successful

career. Both factors determined higher employment levels of higher educated 1970s women at the time of first and even second childbirth (Istat, 2020).

Table C. Distribution of women by macro-area and education. Italian women born in 1972-1976. *FSSCV.*

Table C Distribution of women by macro-area and education. Italian women born in 1972-1976. *Source:* Istat FSSCV (2016)

	Distribution of women (%)		
	Italy	North & Centre	South (Mezzogiorno)
Lower	74.66	72.10	73.99
Higher	25.34	26.68	21.97
N	1160	742	446

Fertility behavior

For what concerns this cohorts' fertility behavior, the differences between single cohorts seem to be moderate compared to the 1960s cohorts. While the number of children per woman diminishes, the decrease is not extremely significant (**Figure 9**). On the other hand, age at childbirth fluctuates considerably; while there is a general increase of 1 year, the mean age at first birth increases for the older cohorts but flattens around 30 years of age for younger ones. At the same time, for third and higher order births, the mean age increases reaching a peak (34.3 years) with the 1974 cohort and then decreases again for younger cohorts (**Figure 10**).

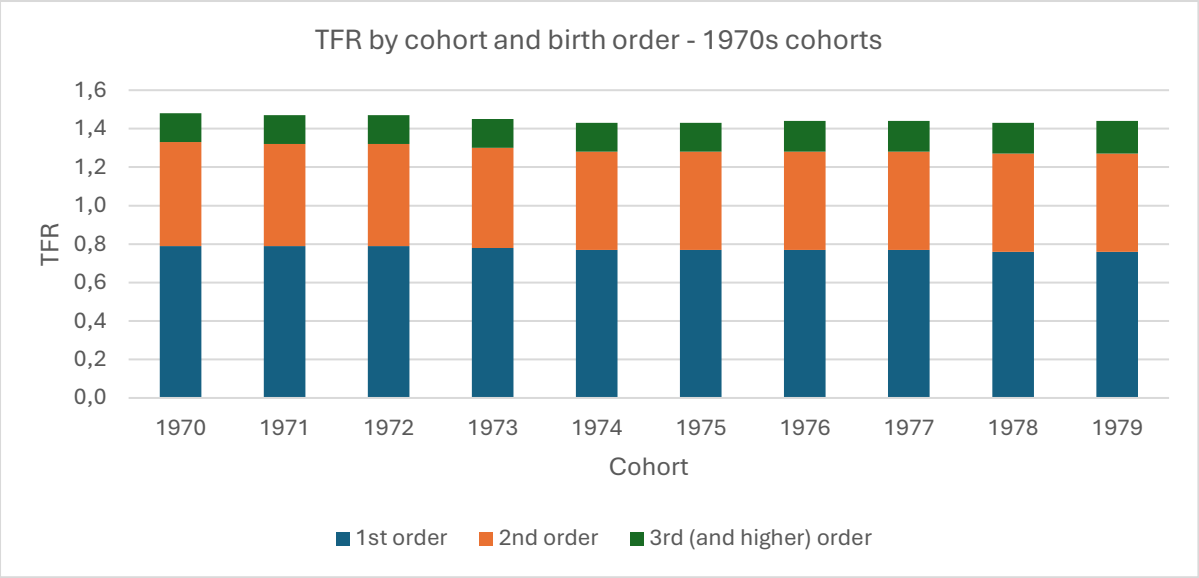

Figure 10. TFR by cohort and birth order. Italian women born in the 1970s. *Own elaboration of Istat data (2024).*

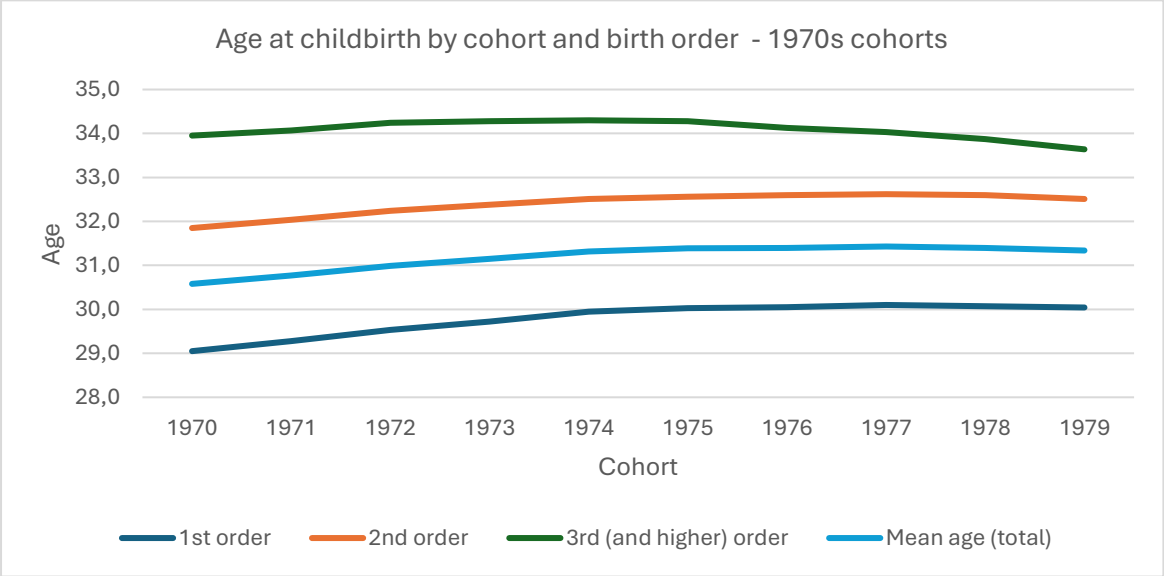

Figure 9. Age at birth by cohort and birth order. Italian women born in the 1970s. *Own elaboration of Istat data (2024).*

Variable interplay: education and fertility

Table D displays the fertility behavior of women born between 1972 and 1976 interviewed by Istat (FSSCV) in 2016. For these cohort, as in the previous case, the TFR observed (1.42) lays below the whole population's TFR (which varied between 1.47 to 1.43 in those years), again confirming that well-educated women have achieved lower fertility compared to the Italian average. In particular, the probability for higher educated 1970s women to have a second child diminishes compared to the 1962-1966 birth cohort (only 42% of women have two children, while for the previous cohort the

number was 6 percentage points larger). Nonetheless, 1972-1976 women seem to have slightly higher propensity to have a first child (from 0.70 for the 1960s cohort to 0.72 for the present cohort). The share of childless women seems to be decreasing as well, with only 28% of interviewed women being childless (compared to more than 30% for the 1960s cohort).

Table D. Fertility of well-educated women. Italian women born in 1972-1976. *FSSCV.*

Table D Fertility of well-educated Italian women born in 1972-1976. *Source*: Istat FSSCV 2016

	0	1	2	3	4+	Total	
Women by number of children (N)	82	88	100	19	6	295	
Women by number of children (%)	27.80	29.83	33.90	6.44	2.03	100	
Women with at least *j* children (N)	295	213	125	25	6	-	
Women with at least *j* children (%)	100	72.20	42.37	8.47	2.03	-	
Children by birth order (N)	-	213	125	25	57	420	
Children by birth order (%)	-	50.71	29.76	5.95	13.57	100	
Probabilty of having a child of order j (parity progression ratio to j = PPRj)	-	0.72	0.42	0.08	0.02	**1.42**	**(TFR)**

The cohorts of the 1970s were born at the beginning of the Italian second fertility transition and became adults two decades later, when fertility was reaching very low levels in Italy. Therefore, the fertility behavior of these cohorts can be interpreted in terms of how the transition to adulthood unfolded in the 1990s. Women born in the 1970s had a higher propensity to prolong their stay at their parents' household compared to their predecessors. Leaving the family house occurred for educational or occupational needs at younger ages; once they reached their 30s, they were likely to leave only to marry. Only in a few cases would they leave to live on their own (Finocchiaro & De Domenico, 2006 in Santarelli & Cottone, 2009).

With regards to family formation, several non-traditional and informal family arrangements were now popular and spread among the population. Cohabitation was now considered as an acceptable alternative to marriage by both young generations and their parents, in contrast to previous years when cohabitating couples had been regarded as deviant by older individuals (Rosina, 2004). In fact, the 1970s birth cohorts were the offspring of those who had experienced the broad social and cultural changes brought about by the 1960s which had contributed to shifting and modernizing social norms, views and perceptions. In this sense, the 1970s birth cohorts benefitted from the innovative wave of change that had influenced their parents' views and perceptions, allowing them to adopt non-traditional paths to parenthood and family building. One positive outcome of the spread of extra marital cohabitation was a slight acceleration of life course events among higher educated women of this cohorts, with positive implications in terms of their reproductive behavior (Rosina & Fraboni, 2004).

The cultural changes of the Sixties produced even larger effects for the 1970s cohorts than those who had influenced the previous ones. Pre-marital sexual relationships became more common among this cohort of women, as female emancipation and sexual freedom were becoming a norm rather than the objective of a social and cultural revolution. Therefore, in the field of contraception, 1970s women were twice as likely to take the pill to achieve controlled fertility rather than resorting to natural methods of contraception (Dalla Zuanna et al., 2005).

According to a negative educational gradient in the transition to first birth, well-educated women born in this decade were less likely to enter motherhood compared to their predecessors. On the contrary, higher education had a positive effect on the propensity to have an additional child after the first birth (Impicciatore & Dalla Zuanna, 2017). For second births, this is justified by a time-squeeze effect undergone by highly educated Italian women born after 1970. In particular, highly educated women born in the 1970s showed a higher propensity to have a third child in northern Italy.[43] This phenomenon could be explained by the more protective labor contracts which women graduates are under, allowing them more flexibility to reconcile work and family, and with the fact that better educated women appreciate the emotional returns of parenthood, leading the change towards more child-friendly preferences (Impicciatore & Dalla Zuanna, 2017; Kravdal, 2001 in Impicciatore & Dalla Zuanna, 2017).

As regards broader economic changes, these cohorts were particularly affected by the world financial crisis of 2008 which impacted both their willingness and ability to have children. When the crisis hit, the women of these cohorts were between 31 and 40 years old, ages at which Italian women were very likely to want to enter motherhood if they were childless, especially in the case of high educated and working women, who had been postponing childbearing for economic and career purposes. During the crisis period between 2010 and 2013, many well-educated childless women born in the late 1970s had their first birth (Caltabiano et al., 2017). While the financial and job-related hardships due to the crisis seem to not have had an effect on their fertility behavior, their transition to first birth was mostly allowed by the accumulation of resources prior to the crisis and the approaching end of their reproductive window. In the case of lower educated childless women from these cohorts, they were more likely to enter motherhood to feel accomplished outside their occupation, where they were very likely to be hit by the crisis and become unemployed (Caltabiano et al., 2017). In short, the fertility of 1970s women with high and low educational attainment was not hampered by the financial crisis – on the contrary, it was boosted by it. The negative implications of the crisis on fertility only

[43] The higher propensity to have a third birth according to educational differentials is found in southern Italy as well, but in the case of the 1970s cohort from the south, this is true for women who had at least completed high school education (Impicciatore and Della Zuanna, 2016).

concerned average educated women, the more likely to face unemployment on one hand and the less likely to reduce uncertainty by entering motherhood on the other (Caltabiano et al., 2017).

2.3.3. Generation 3: 1980s cohorts

In Italy the 1980s bring about a renewed and intense economic growth favored by a wide expansion of the global economy following the fall of oil prices and rising investment levels.[44] During these years, a significant enlargement of the welfare system was promoted by the Socialist-led government of Bettino Craxi aiming at increasing the support to families and adapting offered services to the new needs of Italians. In other words, this decade marked the sectoral change from manufacturing, as the industrialization phase was coming to an end, to services. Nonetheless, the 1980s birth cohorts, despite being born during a period of great prosperity, will become adults during the stagnant 2000s and will be later hit by the Great recession in 2008, two episodes that will shape their life course events also in terms of fertility.

Fertility

The fertility behavior of the birth cohorts born in the 1980s observable today does not reflect the achieved fertility of 1980s women, as they are all still in their fertile years. However, it can suggest behavioral patterns for what concerns fertility postponement and family size. First, there has been an evident decline in births of all orders, especially for the younger cohorts (**Figure 11**). However, such difference might be filled overtime as these women are still in their 30s and might have as little as 15 fertile years ahead of them to recover delayed fertility.

Additionally, age at childbirth decreases significantly as cohorts age, converging at around 29 years of age for all birth orders (**Figure 12**). Such an event is again due to the fact that younger cohorts have just recently reached the age at which older cohorts had their children (mean age at childbirth ranges from 30 at first birth to above 33 at third and higher order births). Moreover, as women from the youngest cohort are now older than their older counterparts and several of them will have children in the future, it is likely that average age at all birth orders will be higher than the mean age for 1980s older birth cohorts and that mean age at childbirth will continue to rise for future generations.

[44] In the 1970s two severe economic crises, also known as oil crisis and energy crisis, had hit the global economy, more specifically the Western world, giving rise to the phenomenon of stagflation (stagnant growth and inflation). Only the following decade these economies began to thrive again.

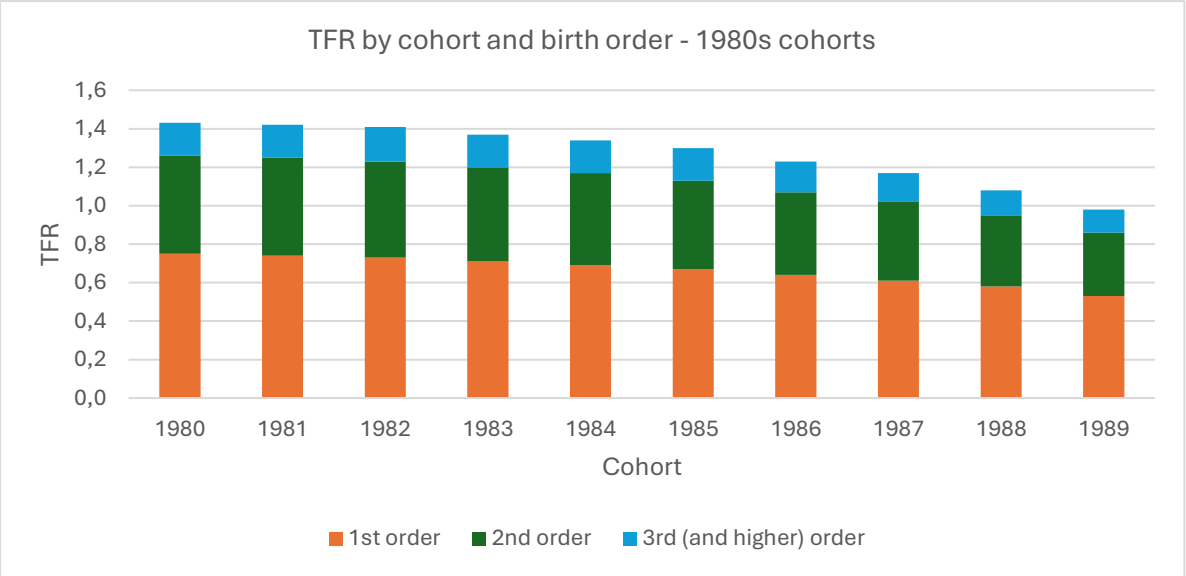

Figure 11. TFR by cohort and birth order. Italian women born in the 1980s. *Own elaboration of Istat data (2024).*

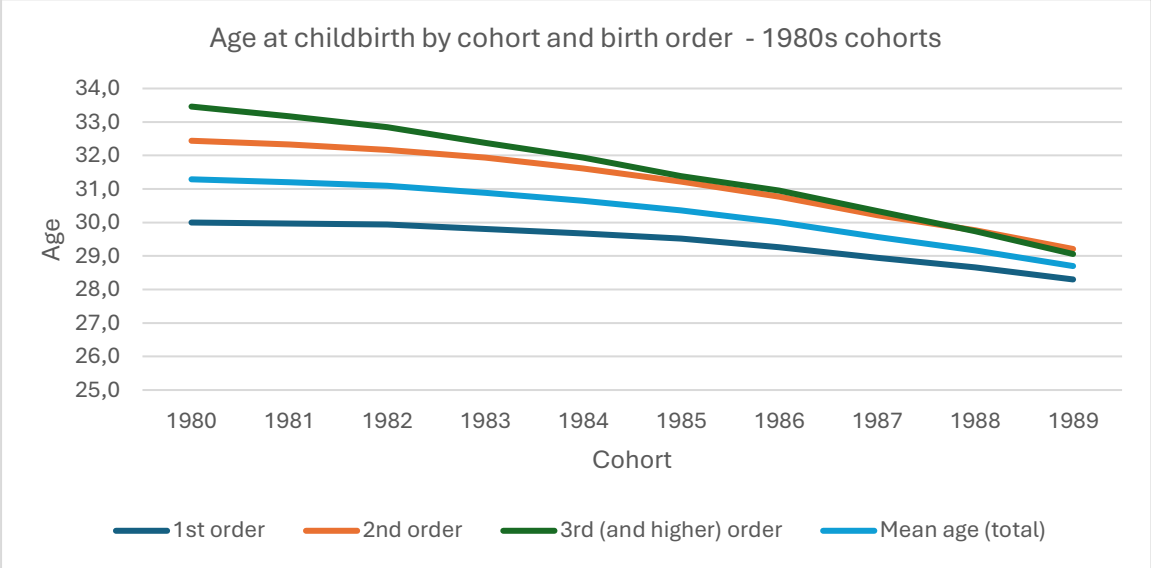

Figure 12. Age at birth by cohort and birth order. Italian women born in the 1980s. *Own elaboration of Istat data (2024).*

Education

Among the women born in the 1980s the share that attends and graduates from a higher educational institution rises considerably compared to the previous cohorts. The percentage of women with university education grows from around 25% to about 38%, with a remarkable increase of 14% for southern Italy (**Table E**). The students among this cohort were the first to attend the new "3+2" degree system after the implementation in 2001 (the older birth cohort had graduated high school that year). The number of university students born in the 1980s, who enrolled in the 2000s, grew compared to

the stalemate that had characterized birth cohorts of the previous decade, accompanied by a fall in drop-out rates (Cappellari & Lucifora, 2009; Rossi, 2010).

Interestingly, the youngest cohort of the 1980s (born in 1989) completed high school education in 2008 and could attend university in the fall of that same year. The academic behavior of the matriculation cohort of 2008 is then strictly related to the economic downturns and implications of the world financial crisis, as they can affect individuals' evaluation of the costs and benefits of enrolling and achieving higher educational levels. For example, in response to the crisis dropout rates declined because of decreasing opportunity costs of attending higher education; on the contrary, a lack of economic resources might have caused a rise in dropout and a decrease in enrollment for individuals that were in need of earning an income (Contini & Salza, 2020).

Table E. Distribution of women by macro-area and education. Italian women born in 1982-1986. *FSSCV.*

Table E Distribution of women by macro-area and education. Italian women born in 1982-1986. *Source:* Istat FSSCV (2016)

	Distribution of women (%)		
	Italy	North & Centre	South (Mezzogiorno)
Lower	62.42	60.89	64.20
Higher	37.58	39.11	35.80
N	801	450	352

Variable interplay: education and fertility

Table F presents the results of the fertility behavior analysis for women born between 1982 and 1986 interviewed by Istat (FSSCV) in 2016. In this case, the TFR (0.59) is considerably lower than the TFR observed for the 1970s cohorts irrespective of their educational levels (which varied between 1.41 and 1.23 in 1982-1986), specifically because at the time the FSSCV survey was conducted the interviewees were extremely young and very likely to be postponing their fertility to older ages. In fact, 67% of women were childless at the time. Of those that had already children, the probability of having a third birth (0.14) is reduced by nineteen points compared to the probability of having one child (0.33). Such difference is closer to the one observed for the 1962-1966 cohort (twenty-two points), whereas it is considerably lower than the one observed for the 1972-1976 cohort (thirty points). It would seem that, for the women considered, the propensity to have a second birth decreased for the 1970s cohorts compared to women born in the 1960s but increased again for 1980s women.

Table F. Fertility of well-educated women. Italian women born in 1982-1986. *FSSCV.*

Table F Fertility of well-educated Italian women born in 1982-1986. *Source*: Istat FSSCV 2016

	0	1	2	3	4+	Total	
Women by number of children (N)	203	59	35	4	2	303	
Women by number of children (%)	67	19.47	11.55	1.32	0.66	100	
Women with at least *j* children (N)	303	100	41	6	2	-	
Women with at least *j* children (%)	100	33	13.53	1.98	0.66	-	
Children by birth order (N)	-	100	41	6	23	170	
Children by birth order (%)	-	58.82	24.12	3.53	13.53	100	
Probabilty of having a child of order j (parity progression ratio to j = PPRj)	-	0.33	0.14	0.02	0.01	**0.56**	**(TFR)**

Women born in the 1980s have many fertile years ahead of them or are just now approaching the end of their reproductive life span which usually occurs between the mid-40 and early 50 years of age. Thus, their achieved fertility might still significantly change, especially for the younger women of the cohort (the youngest group will turn 36 years old at the time of publication), who may still be interested in childbearing and in recovering lost opportunities for childbirth at older ages. In fact, since 2020 a high share of births (8.7%) was to mothers aged 40 and over, attesting that fertility recuperation is taking place among 40-year-old women; nevertheless, fertility recovery is likely to be limited at one child per woman given age constraints on the reproductive window (Eurostat, 2023).

From the point of view of giving up having children, fertility intentions of this cohort seemed to point favorably towards fertility recuperation and higher fertility levels. Evidence from the 2009 Istat survey *Famiglia, soggetti sociali e condizioni dell'infanzia* seemed to show how a smaller share of women intended to remain childless among the 1980s cohort, compared to their predecessors (Fiori et al., 2017). Among those who did not want children, the highest share was the wealthiest. On the contrary, childlessness is prevalent among the fertility behaviors of this cohort, as 25% of women born in this decade are childless today (Istat, 2021).

Certain fertility behaviors of these cohorts were inherited from their predecessors born in the 1970s. For the 1980s cohort, the educational gradient is still negative for first births, more specifically for university educated women in the north and for upper secondary educated women in the south. The positive educational gradient on the propensity to have an additional child and third births observed for women born in the 1970s persisted in the 1980s. It follows, the hypothesis of well-educated Italian women adopting a faster transition to second births according to a time-squeeze effect is applicable to this cohort, too. In other words, the educational and territorial differentials observed for the previous cohort remain unchanged for women born in this decade (Impicciatore & Dalla Zuanna, 2016). According to this analysis, the impact of female education on Italian fertility has not weakened overtime and north-south differences have persisted and remained significant.

2.4. Summary

Italian fertility has followed a pattern of generally consistent decline throughout the last seven decades. In compliance with broader European trends, the number of births has decreased, while the transition to motherhood occurs at increasingly older ages. Cultural, social and economic changes provoked a shift in values and attitudes associated with partnership formation and, more importantly, family building resulting in strong behavioral deviation from previous fertility patterns. Part of this change in fertility attitudes and behaviors is attributable to rising educational levels of women who have become more and more inclined to finding sources of self-actualization beyond the fulfillment they may feel by becoming mothers.

Education is a crucial intervening variable in the evolution of Italian fertility rates. First, well-educated women are more likely to transition to motherhood because of longer periods of enrollment in the educational system and delayed economic and residential independence. Second, well-educated Italian women have often become the precursors of new behaviors in terms of everyday life and fertility. The move towards delayed and lower fertility was first enabled by an increased use of modern contraception, such as birth control medication and devices. Access to such kinds of contraceptive methods was first obtained by more educated women, whose propensity to control their fertility was higher. Contraceptive use later spread to all educational strata, in a diffusion of attitudes and behaviors favoring later and lower fertility. Then, the expansion of female education boosted female labor participation rates starting from the 1970s which has contributed to change women's attitudes towards childbearing and their levels of achieved fertility (Istat, 2020). The impact of education on fertility attitudes and behaviors does not seem to have lessened overtime (Impicciatore & Dalla Zuanna, 2017).

Nevertheless, the spread of tendencies to delay and lower fertility has not been uniform across the Italian peninsula, in particular because of very high variation of cultural, social and economic factors. In fact, strong territorial differences have shaped fertility levels across the country, which have followed two different paths in the south and the north of Italy across time. While southern fertility rates have departed from very high levels and have experienced a consistent and steep decline towards low levels, in the north the decline in the number of births has shown a modest slowdown due to new patterns of family formation and the contribution of migrant fertility. Today, fertility levels across the country have virtually converged but the route to current fertility levels has markedly differed. Intervening factors in the relationship between education and fertility, among which the use of contraception, the magnitude of welfare support, the rigid labor market structure, the strength of

gender and traditional norms, have contributed to differentiating the fertility attitudes and behaviors of Italian women of the "two Italy".

This difficult contextual framework in Italy worsens the chances of the state apparatus to be able to tackle the issue of low fertility and population aging. Policy and historical constraints have hampered the possibility of pursuing a pro-natalist line of action, while also preventing an improvement of welfare protections and benefits targeted at families and the youth. As a consequence, the current Italian system does not possess the instruments to ease the obstacles to fertility encountered by the population, especially women. First, the difficulty to reconcile career and family within the Italian environment and the diffused traditional attitudes towards gender norms particularly hit well-educated women, whose opportunity costs in terms of childbearing are extremely high. Second, traditional gender norms are still widely shared across the country, despite more gender egalitarian attitudes are spreading in the northern areas. Women might still feel they have to abide by the male-breadwinner paradigm, and they might not receive support from their partner in childrearing and taking care of the household, regardless of their employment status. Third, the labor market strongly disfavors women as they are often not granted enough benefits enticing higher fertility or under temporary and unstable contracts. Fourth, the Italian welfare system provides insufficient support to young couples and families intending to build or enlarge their nuclear family. Welfare support is mostly directed at elders, it does not address the difficulty of women to reconcile family and paid work, and it relies on the family as the main locus of care.

It follows, education may be associated with delayed fertility and lower achieved fertility levels in Italy. In particular, education is negatively associated with first births, which occur later for better educated women compared to their peers. In fact, the average age at childbirth rises with rising levels of education. On the other hand, higher order births may be positively correlated with educational levels, as well-educated women may want to increase their chances of enlarging their family nucleus by shrinking the time between their first birth and the following. A certain degree of variability is observable across Italian macro-areas, due to different levels of education, of female labor market participation and different degrees of acceptance of gender and family norms.

The generational analysis of changing fertility behaviors across time and considering educational levels reveals the underlying factors affecting the association between fertility and education. Higher educational levels and the spread of contraception contributed to the emergence of fertility postponement and the rise in the average age at childbirth. Such mechanisms were reinforced by the increasing labor market participation of women, who were moving away from the historically gender-typical perception of the female figure in the home. While juggling their job and their family had been problematic for women born in the first half of the 20th century, the 1960s cohorts were able to

work around the difficult reconciliation of both spheres in Italian society by resorting to fertility postponement to strive towards personal goals outside the family. However, women that entered the labor market were more likely to delay childbirth to pursue their professional career, ultimately resulting in an overall decrease in fertility, due both to reproductive window constraints and the difficulty in reconciling having a job and childrearing.

A de-standardization of life course events has occurred in Italy which contributed to undermining the traditional steps to build a family, as marriage. Italian couples were more likely to cohabitate with their partner especially since the 1960s and 1970s cohorts, for whom the modernization of family and gender roles brought about by social movements and cultural change became a norm. Although marriage had long been a precondition for both the transition to adulthood and that to parenthood, a de-coupling of these events brought about new opportunities for young couples, whose number of out-of-wedlock children rose significantly reinvigorating the declining Italian fertility rate.

On the other hand, problematic labor market conditions and economic fluctuations have largely hampered fertility, first by diminishing the amount of resources that Italian couples can invest in childbearing and second by raising insecurity levels. Changes in the labor market structure starting from the 1990s affected in particular the young cohorts and women that were then entering the labor market in the 2000s. These categories were the most prone to employment instability, low employment benefits and temporary contracts. A decline in unemployment rates promoted by the flexibilization of the Italian labor market did not translate into improved labor market conditions, which in turn could not stimulate fertility.

Although the Italian context has changed throughout the period considered, it is possible to find several similarities among the three generations of Italian women. First, the trend towards delayed fertility and smaller families characterizes the entire population; nonetheless, more definite tendencies can be observed among the well-educated. Second, better educated women across all generation are likely to resort to fertility recuperation at older ages, hastening the transition to higher order births after they have had their first child. Third, while fertility intentions have generally not changed for well-educated women compared to their peers, an increase in childlessness can be indirectly correlated to educational differentials, as childless women tend to have less traditional orientations, to have cohabitated with their partners and to be employed. In short, most fertility attitudes and behaviors correlated with educational levels have persisted for the three generations considered.

3. LABOR MARKET-RELATED VARIABLES, EDUCATION LEVELS AND FERTILITY: HOW EMPLOYMENT CONDITIONS AFFECT FERTILITY

The previous Chapter has provided an overview of how complex the relationship between education and fertility is for women in Italy. Several contextual factors intervene in the correlation between educational levels and fertility behavior and exacerbate women's difficulties in transitioning to motherhood. Among these, the structure and the working conditions in the labor market and the few family policies and labor protections for mothers all play a role in making the transition to motherhood difficult for well-educated and working women who do not want to give up childbearing for personal fulfilment in their professional career.

The demographic distribution of educational attainment in Italy shows that women have higher educational attainment than men and they are more likely to obtain a degree from university. The gender gap in Italian graduates has even widened in favor of women in the last ten years as they have consistently represented the 60% of Italian graduates in the last decades. Since the early 1990s more than half of Italian graduates are women across all types of university degrees with the exception of post-doctoral degrees. They constitute 68.8% of graduates from 5-years courses, 59.7% of graduates from 3-year *lauree triennali* and 57.7% of graduates from 2-year *lauree magistrali* (AlmaLaurea, 2024a). Nonetheless, such high figures in educational attainment do not translate in high female labor force participation. Even more interestingly, Italy has had one of the lowest fertility rates in Europe for decades, despite almost half of the female population not working. Thus, Italy makes a unique case with regards to the association between education and fertility, also in relation to female employment. In light of this, shifting the perspective to the occupational choices and circumstances of different educational classes of women might help uncover some of the mechanisms that contribute to determining Italian fertility rates.

Beyond the effects of enrolment duration and educational levels, a third dimension of education has been investigated in connection with family formation in Europe. Choices about the educational field can influence women's fertility, based on the assumption that women graduating with degrees associated with higher female participation find an occupation earlier and thus can transition to motherhood earlier as well. However, existing literature mostly focuses on northern European countries which are fundamentally different from the Mediterranean area and, most importantly, from Italy. On the contrary, employment factors have been largely investigated with regards to transitions to parenthood and completed fertility for both Italian men and women, especially following the large

labor market deregulation and the legislative attempts to make the job market less rigid. Combining the two approaches might shed more light on the relationship between female education, employment and fertility, in a context where the decline in births is becoming more and more alarming.

This Chapter intends to investigate whether occupational characteristics are conducive to childbearing choices for women embedded in the Italian context based on their educational history. More specifically, a statistical analysis is conducted for Italian women born in the 20th century over the course of around 45 years to find evidence of the influence of part-time, temporary employment and positions in male-dominated sectors on their achieved fertility. The Chapter is structured as follows. The first section introduces the discussion about female employment by identifying the origins of women's occupational history (Section 3.1), briefly presenting existing research on the topic (Section 3.1.1) and framing the research question based on the Italian context (Sections 3.1.2; 3.1.3). The second section presents the case study and discusses the statistical findings (Section 3.2). Finally, the last section summarizes the arguments made in the Chapter and the relevance of the results of the Italian case study (Section 3.3).

3.1. Female employment: the educational roots of occupational choices

An individual's professional career is strongly linked with previous life events and, particularly, with the educational path. Decisions on what to study during one's educational career are rooted in the individual's preferences and orientation towards certain jobs, as well as the ambition to have a specific occupation later in life. When people plan their educational path and choose the discipline to graduate in, they are also making a decision in terms of how long they will be enrolled and what their career prospects will likely be. Therefore, educational choices can directly and indirectly heavily affect one's life course and influence one's occupational and fertility choices later in life.

This section discusses the nature and origins of the connection between education and occupation. First, women's behavior while they are enrolled in the education system, especially from the point of view of the selected educational field, is examined in light of existing literature (Section 3.1.1). Then, Italy's case is analyzed, paying particular attention to which educational and occupational fields Italian women tend to pursue and why. The last sub-paragraphs present the institutional, structural, social factors and the individual characteristics informing women's educational and occupational life choices (Section 3.1.2) and the economic sectors where they are most likely to be employed based on the characteristics of the Italian labor market (Section 3.1.3).

3.1.1. Can education influence women's occupational path? The field of study

Assumptions about the correlation between the educational field and fertility behavior are mostly based on the categorization of disciplines in gender-typical fields. In accordance with traditional gender norms and roles, certain fields of study are more aligned with stereotypical feminine or masculine characteristics. For example, a woman employed in healthcare and teaching will more likely perform gender-typical roles (Goffman, 1977 and West & Zimmerman, 1987 in Begall & Mills, 2013). It follows that women who have attended more feminine educational fields are expected to transition earlier to motherhood vis-à-vis other educational fields and to have lower propensity to remain childless.

The different outcomes deriving from attending one of the two gendered categories have been linked with few mechanisms that reinforce the stereotypical attitudes and roles played by women and men. For one, it is argued that feminine educational fields socialize women towards developing values and perceptions aligned with gender-typical attitudes and behaviors. According to a process of socialization, women who have attended this type of education have a higher propensity to form higher fertility intentions and greater desire for (early) family building (Hoem et al., 2006a, 2006b; Van Bavel, 2010). On the other hand, previously formed preferences and fertility attitudes may influence a woman's choice concerning her education.[45] Based on their priorities, women can be categorized as home-centered when they prioritize family and children and prefer not to work, or as work-centered when they are committed to work and their career is their main interest; adaptive women without a specific orientation or whose interest is to combine the work and family dimensions lie in the middle (Hakim, 2000). Therefore, individuals with greater family orientation and a higher propensity to enter motherhood early compared to their peers, will be more likely to self-select themselves into feminine educational fields that are more consistent with their preferences. In particular, Hakim (2003) found that women with stronger family orientation tend to choose educational paths centered on the development of inter-personal skills and taking care of others. It is likely that such reasoning is replicated when they make labor-related decisions and select their occupation.

Most of the literature available on the effect of educational fields on fertility concerns northern Europe and, more specifically, Scandinavian countries. Researchers have found that women with degrees in educational fields linked with caring, such as education and healthcare, have lower propensity to remain childless, higher probability of having a first birth and higher completed fertility (Lappegård & Rønsen, 2005; Hoem et al., 2006a; 2006b). Moreover, women's transition to first and higher order births is affected by their educational field, by their occupation and by whether their jobs are

[45] The socialization argument is discussed in the first Chapter (Section 1.2.4).

predominantly performed by women (occupational sex segregation); when they are employed among a higher number of women, they are more likely to have a birth of any order (Begall and Mills, 2013). While existing literature on these topics is quite extensive and an association between fertility and educational field has been identified in several countries, the geographical region which these studies refer to limits the applicability of such arguments to other areas. As stated previously, Europe is a very diversified continent in terms of social, cultural and economic dimensions. Northern Europe and Scandinavian countries tend to have more egalitarian gender and social norms, higher female labor participation, larger welfare systems, and very different economies than other parts of Europe. The differences are particularly striking when they are compared to southern and Mediterranean Europe, which have rarely been the object of this kind of demographic analysis.

For what concerns the latter, Martín-García and Baizán (2006) study the correlation between fertility and education in Spain finding that both the level and the field of education account for differences in family building behaviors among Spanish women. According to their results, employment involving care and interpersonal skills is positively associated with earlier first births across all education levels, suggesting that there is an association between the field of study, occupation and fertility behavior. Bagavos (2010) argues that childlessness is less likely to be connected to educational levels vis-à-vis educational field for Greek women, and that disciplines studied by women in school are a major predictor of diversity in fertility patterns in Greece. Finally, the only study conducted on Italy concerning these variables was published in 2020 by Solera and Martín-García. The authors test fertility behavior against educational levels and fields, finding that the correlation between educational career and fertility is different from what had been observed in other countries. Among higher educated women, those with a degree in psychology or teaching are the most likely to enter motherhood, while women from all other fields have the same propensity (less than the previous group) to have children (Solera & Martín-García, 2020). Most importantly, according to their analysis the difference between women from different educational levels does not surface when they account for educational fields.

In conclusion, existing literature provides cross-country proof of the association between educational field and fertility patterns. Individual preferences and social norms are conducive to certain disciplines and, consequently, to specific occupations as well. Women's priorities in terms of family building and career paths heavily influence the selection of the type of education and related job opportunities based on earning prospects, working conditions and penalties for time spent outside the labor force. Given the lack of studies produced on the Italian case and the unique contextual factors present in the peninsula, an analysis of the association between educational field, occupation and fertility should contribute to existing literature and to explaining the dynamics behind Italian fertility

rates. However, a comprehensive study of these dynamics has yet to be produced due to the absence of data gathered on the educational career and, in particular, on the field of study of Italians.[46]

3.1.2. Individual, social and institutional factors affecting educational paths in Italy

Family formation patterns are at least partially the result of selection processes based on women's heterogeneity of lifestyle preferences with regards to childbearing and their career (Hakim, 2000). Family centered women regard education as a source of social and human capital rather than the means through which obtain an occupation. Women with career orientation, on the other hand, consider education as a qualifying training in view of their future employment. In the former case, women choose their educational path in view of building a family; in the latter, they envisage a smaller family size according to their educational and professional goals (Martín-García & Baizán, 2006). In Italy, such orientations and preferences may be informed by the social and gender norms pervading society; especially in areas where traditional values and norms are more strongly upheld, as in southern regions, Italian women may be more likely to adhere to the male breadwinner family model.

Apart from individual and social factors, institutional elements concerning the education system are conducive for the choice of a woman's educational career. Structural characteristics of the education system affect fertility by influencing the timing of entry into the labor market and, consequently, motherhood. For example, changes in values and perspectives with regards to family formation and career path might be coupled with changes in the educational career. A flexible education system is more accommodating to these changes, as students may modify their educational decisions *in itinere*. Italy's education system does not allow for much change, as it is characterized by structural rigidity and sequentiality (Caroleo & Pastore, 2007). Children are called to choose between a general (*licei*) or a vocational (technical and professional schools) education at the end of middle school, after which they are strongly discouraged to switch their educational career. Tertiary education is accessible to all high school graduates in theory, but the long and challenging path to obtain a degree rises the costs of getting a higher education.

Moreover, other structural factors such as the gender segregation of the education system are able to affect fertility attitudes and behaviors. In Italy, the prevalence of women across degree levels is not mirrored in the distribution per field of study. While in 5-year degree courses they represent the largest share of graduates independently from the field of study, they are more likely to pursue and obtain a

[46] As of today, the author is unaware of the existence of a dataset containing recent information on the educational field, along with the level attained. This kind of data was collected only once by Istat in the 1998 edition of the *Famiglia e soggetti sociali* survey series. Other foreign agencies collect information on the field of study (e.g. European Social Survey); however, this type of data is not available for Italy.

degree in humanities during their *lauree triennali* and *magistrali* rather than in STEM.[47] In 2024, 94.4% of Italian graduates in education are women, whereas they make up only the 14% in ICT and informatics (AlmaLaurea, 2024a). In the case of medical degrees, 76% of graduates in healthcare are women; although such disciplines may be classified as STEM, they pertain to the care of others, thus belonging to a unique and still feminine occupational category (AlmaLaurea, 2024a).

Sex segregation starts as early as during the high school years, as the school of choice, especially among *licei* (non-vocational schools with a focus on humanities or STEM subjects), largely predicts the educational study the high school graduate will pursue in university (AlmaLaurea, 2024a). In other words, the gender segregation of the Italian educational system occurs at most educational levels and often remains constant as students progress to higher levels. Such gender segregated settings contribute to the creation of a social environment in which pre-existing fertility attitudes are either reinforced or dampened (Martín-García & Baizán, 2006). In female dominated fields, it is easier for gender-typical norms to circulate and reiterate the perception of women as carers and mothers. However, this might not necessarily result in unemployment; instead, a female dominated environment might promote the idea that reconciliating family and career is possible.

To summarize, the educational path of Italian women is shaped by several factors. Personal orientations, preferences, social, structural and institutional elements all influence, first, one's educational choices in terms of duration, skills and field, and, later, other life events. Notably, the educational career in terms of field of study and expertise likely predict *a priori* the future career opportunities of women and, in turn, their family-building ability. In other words, education, employment and fertility are strongly interrelated and determine several life transitions and outcomes for women.

3.1.3. The product of educational choices: female employment in Italy

Choices made during the educational career, such as those concerning the duration of enrollment and the field of study, remarkably affect the life course of women, especially with regards to labor- and family-related dimensions. The skills and knowledge acquired during the educational career will influence whether their entry into the labor market will be early and easy, whether their occupation will be secure, what prospects they will have career- and wage-wise, and how smooth the reconciliation between employment and childbearing will be. General educational degrees might not correspond to a clear array of jobs or, in other cases, to jobs for which there is low demand; in either

[47] The number of male STEM graduates is considerably larger than the female share (in 2020, 39.2% of male students graduated in STEM, vis-à-vis 18.9% of female students) (Ghiselli, 2022).

event, the job search is likely to be long and to conclude unpleasantly, with low income and high risks of unemployment (Hoem et al., 2006a).

The Italian labor market is highly segregated with regards to female employment. First, the gender gap in favor of women with regards to educational levels and the number of graduates does not translate in easier access to the labor market or more successful and well-paid careers.[48] Apart from the widespread glass ceiling, describing the low numbers of female employees occupying leadership, managerial and high-level positions, women are also segregated horizontally (Minello, 2024). In other words, there are fields where the highest shares of employees are women, whereas in others they are underrepresented. Partly, the horizontal segregation is due to women's educational history, as they are more likely to get hired in the economic sector that is a closer match with their studies, especially when they are well-educated. On the other hand, women may be influenced in their choice by public perception and conventional gender roles, self-selecting themselves into fields that embody the traditional views upheld by the Italian society (Lesthaeghe, 2002). Moreover, women entering the labor market tend to be hired in sectors where the number of female employees exceeds that of their male counterparts. It follows, while female participation grows, the distribution of women across the labor market does not necessarily become more balanced.

Gender segregation in the labor market may encourage stereotypical gender behaviors through socialization and family-friendly working conditions (Hoem et al., 2006a). As for education, pregnancies are statistically more likely to happen for women in female dominated occupations, due to the higher number of female workers. It follows that they may perceive motherhood as a feasible choice encouraged by the experience of their peers. Pregnancy is also more common in these environments because of the working conditions offered by these occupations which are more compatible with family building. Female dominated areas are more likely to be family-friendly and offer more benefits, higher flexibility and lower motherhood penalties, especially when women exit the labor force to devote time to childbearing. On the other hand, employment conditions in these sectors might be precarious, with unstable and non-standard work contracts and poorer career prospects. Although these circumstances may not be directly conducive to childbearing, women in these occupations encounter less opportunity costs of having children with regards to their professional life and may decide to entry motherhood earlier.

As anticipated in the previous Chapter, other labor market conditions interact with Italian women's intentions and ability to have children.[49] First, by influencing their ability to reconciliate family and career, the type and terms of the work contract can be linked to certain degrees of fertility. The nature

[48] See Section 2.2.2.
[49] See Section 2.2.2.

of women's employment contracts has been proved to be a reliable predictor of fertility outcomes. Temporary contracts are negatively correlated with childbearing, as they increase the individual's levels of instability and insecurity (Guetto et al., 2023; Pieroni et al., 2023). On the contrary, permanent employment is generally characterized by social protection, maternity leave, social-security contributions, and unemployment benefits. Therefore, higher wages and higher social protection offered by permanent contracts significantly increase the economic and psychological security of the employee, who is thus more likely to have children. Italian women, however, are much more likely than men to be offered precarious rather than permanent work contracts (Ghiselli, 2022; Minello, 2024). With regards to the contract's terms, a reduced number of working hours under a part-time work contract is a feasible solution to the issue of reconciling the private and public dimensions of women's lives (Del Boca, 2002). Additionally, part-time work is more compatible with family responsibilities and the organization of Italian society, which widely adheres to familism and mothers' duty to take care of the offspring.

For similar reasons, another labor market-related variable affecting women's fertility is the economic sector where they are employed. In general, employment in the public sector is positively correlated with fertility. Public employment guarantees higher levels of employment stability as it is less subject to recessions, and unemployment fluctuations and labor contracts are usually permanent (Carta et al., 2023). It follows, public employment considerably reduces insecurity sentiments allowing women to embark in long-term plans such as family building. Moreover, an occupation in the public sector generally includes parental leave and other benefits that encourage fertility behaviors vis-à-vis professional ambitions and duties. While maternity leave was extended to female workers across sectors (and, more recently, across contract type) in the 2000s, women in the public segment of the labor market enjoy more generous protection in terms of both maternity pay and leave. Finally, the public sector usually grants more flexibility in terms of working hours. In general, women's public sector jobs are structurally similar to part-time occupations due to the limited amount of hours worked per week (e.g. in teaching). As a consequence, Italian women that are employed in the public sector tend to have higher fertility (Adserà, 2004).

As a result of both the gender segregation and the structural features of the Italian job market, the segments where the highest number of employees are women are the services and care sectors. In the public sector, female employees constitute 60% of the workforce amounting to two million employees (Carta et al., 2023). In particular, women are overrepresented in the fields of social work, education and healthcare (Minello, 2024). Nonetheless, they are highly vertically segregated even in the labor market branches where they are the most present gender, as few women occupy higher-paid and managerial positions. To summarize, female dominated sectors are more aligned with the gendered

character of Italian society and are in theory more conducive to the possibility of becoming mothers, thanks to higher flexibility, more (effective or virtual) part-time opportunities and easier exits and re-entries after childbirth (Hoem et al., 2006a). In practice, however, they may only offer women temporary contracts and lower wages, making female employment in these labor market segments not necessarily compatible with family-building.

3.2. Case study: education, female employment conditions, and fertility in Italy

Having identified the roots and the dynamics of the interplay between education, employment and fertility, a case can be built on the Italian example to highlight the factors determining the stagnation (or better, the decline) of fertility levels in the country. The case study is based on the work published in 2024 by Alderotti et al. (2024), whose paper relied on the FSSCV to study the implications of unstable employment on "(quasi-)completed" fertility for both Italian men and women. As the authors set a threshold at 41 years of age, it is necessary to specify that the fertility levels observed in this paper are not complete, as women generally exit their reproductive window around their mid-40s and men are fertile beyond that age.[50] They adopt a cohort-based approach to investigate the weight of atypical and fragmented employment on the transition to parenthood and overall fertility. The results suggest that individuals with atypical contracts and fragmented professional paths are more likely to postpone having children and to have smaller families at the end of their reproductive years. Moreover, these findings deny that "catching up" effects of couples who have experienced this type of episodes in their professional careers is not taking place at sufficient pace; instead, labor market deregulation and the consequent instability and insecurity are worsening the demographic environment by accelerating population ageing and decline (Alderotti et al., 2024).

This section incorporates other labor market-related variables into the analysis of Alderotti et al. (2024) to deepen the understanding about women's fertility outcomes resulting from differentiated career paths. In particular, employment conditions that are generally conducive to childbearing for women are taken into consideration to further the analysis of Alderotti et al. (2024)'s paper. Through the use of a multinomial logistic regression model, the occurrence of part-time, temporary employment and positions in male-dominated sectors across Italian women's professional life are weighted against the family size to confirm whether a positive correlation exists between these variables.

[50] The threshold was set to include individuals that had been impacted by the labor market deregulation that occurred from the 1990s but who were also close to the end of their reproductive window. Therefore, Alderotti et al. (2024) use the term "(quasi-)completed fertility to refer to the total number of children at the time of observation.

This section is structured as follows. First, the research question and the hypothesis concerning labor market-related variables are introduced (Section 3.2.1). It is predicted that part-time employment and jobs in male-dominated fields will have a positive influence on fertility, while temporary contracts will affect it negatively. Second, an overview of the data and methods used to conduct the statistical analysis is provided (Section 3.2.2). Third, the results of the application of the statistical model are presented (Section 3.2.3). Fourth, the findings of the statistical analysis are discussed along with the limitations of the study (Section 3.2.4). Finally, the arguments made throughout the Chapter are summarized (Section 3.3).

3.2.1. Stating the issue

A study from 2008 found that around one fifth of Italian women leave the labor force once they become mothers (Casadio et al., 2008). It is argued that such a decision is largely driven by the degree of security and protection offered by their work contracts prior to childbirth. Women that work in public employment, for example, which offers very high level of employment protection, are more attached to their profession and are more likely to retain their job after childbirth. Additionally, they have higher chances of getting a part-time working arrangement, which better reconciles work and family and allows them to stay in the labor force. On the contrary, the probability to leave the labor market is higher for women with temporary work contracts, who enjoy much less protection and security than women in permanent positions. It must be noted that such dynamics are affected by personal orientations in turn informed by the level of education; highly educated women tend to be more attached to their job and less likely to stop working after they become mothers (Casadio et al., 2008).

Employment conditions matter after the birth of the first child, too. With the rise of dual-earner families and the necessity to have more than one salary between two partners because of the cost of living, it is often crucial that women remain in the labor force to continue contributing economically to family expenses. Certainly, women's orientations and aspirations matter as well, in particular for the better educated, who are likely to have invested in human capital in anticipation of their professional career. Nevertheless, the Italian context is still incompatible with working mothers, who are the bearers of most family and childrearing responsibilities. Then, working conditions heavily influence women's fertility choices depending on the ease of the work-family compromise, their fertility intentions, the social environment, their partner's employment stability and the support they may receive from other family members.

From the point of view of a job's perceived security and stability, part-time work does not necessarily correspond to higher employment protection, but it translates into more time available for attending

to family responsibilities. Women that have children but do not wish to leave the labor market may adopt part-time as a strategy to avoid choosing between family and employment. Nonetheless, it must be considered that, when associated with poor paid and lower protected positions prior to childbirth, women may decide to leave the labor force regardless of the schedule-wise benefits offered by their contract (Fiori & Di Gessa, 2023). What is more, this choice may be informed also by their partner's economic capacity; the higher it is, the less necessary it is for them to retain their job after having a child, not accounting for their personal aspirations concerning their professional career. However, it can be argued that, especially in the case of work-oriented women with a family, part-time may be conducive to childbearing.

> *H1: Part-time employment is positively correlated with childbearing as it represents a compromise between work and family duties.*

On the contrary, jobs that require women to spend a higher amount of time at work are likely to be hindering fertility. Such working conditions are typical of masculine and male-dominated fields of the labor market, where the scarcity of female employees casts a shadow over care necessities for the family and the offspring. On one hand, the social expectations deriving from gender and traditional norms that still pervade the Italian society place an unbalanced burden on the shoulder of mothers vis-à-vis fathers, constraining their freedom of pursuing their career. A long time away from the home makes it more difficult for them to attend to their socially constructed role of wives and mothers, downsizing their fertility aspirations. A woman that intended to have a certain number of children may be pushed to lower her desired family size because her job would not allow her enough time at home to take care of her children. On the other hand, the low number of women employed in these sectors diminishes the magnitude of benefits and opportunities offered to parents, such as parental leave, flexibility and part-time work, as they are usually performed by men who are less likely to need them. As a consequence, women with very demanding jobs such as those in male-dominated fields are expected to have a lower fertility outcome than women having less on their plate from the professional perspective.

> *H2: Women working in male-dominated fields which require long hours in the office are more likely to have lower numbers of children due to the time away from home.*

Finally, permanent or temporary employment heavily affects the stability and security of women, which ultimately determines their perceived and actual ability to have a certain family size. Women under temporary contracts are more insecure about their job status in the long run, which causes negative expectations about the future, ultimately hindering fertility decisions. Also, temporary contracts are usually associated with wage volatility which, in the case of repeated episodes of

temporary employment, significantly reduces the chances of progressing to higher salaries. At first, such working conditions encourage women to postpone childbirth; later, they might force them to give up childbearing altogether (Pieroni et al., 2023). Thus, as the degree of job protection and economic stability provided by temporary employment is lower, it is likely to reduce both women's desired and actual number of children.

H3: Temporary employment contracts are negatively correlated with childbearing.

3.2.2. Data and methods

To ensure continuity with previous analyses, a sample of 6,670 women has been selected from the data gathered by the FSSCV in 2016. This study contains extensive data about life course and events, including detailed information about up to 12 episodes of employment (eleven past and one current occupation) for each individual. The women considered were born between 1942 and 1986. Among them, only the older generations (including the 1960s cohorts) had already reached the end of their reproductive window and thus, completed fertility. Therefore, as stated by Alderotti et al. (2024, p. 5), the analysis below is conducted on the sample's "(quasi-)completed fertility", as at least a third of the women in the sample were under 40 years of age. Fertility was split in three categories according to whether women had had zero, one, or two or more biological children.

All 6,670 women were employed at least once in their life; women that had never been in the labor force were not included in the sample. To assess the weight of occupational life events over (quasi-)completed fertility levels, a set of indicators were selected in terms of part-time, temporary employment and jobs in male-dominated sectors. The professional career was measured in terms of the duration (in months) of part-time employment, the duration (in months) of employment in male-dominated fields and the duration (in months) of employment under a temporary contract. All three variables were then re-categorized as binary variables to at least one month of experience (with value 1) or none (with value 0) under such working conditions. In order words, all three were constructed as dummy variables to be employed within the statistical analysis.

The set of control variables considered in the modelling strategies was selected based on the work of Alderotti et al. (2024). As individual and background characteristics heavily influence fertility decisions and thus may differentiate fertility outcomes, both categories informed the selection of the series of control variables. In the former case, the woman's place of birth (among the current area of residence, another Italian city or abroad), educational level (higher education or below) and the current area of residence (north-west, north-east, center, south Italy or the isles) were considered. In the latter, the following variables were included: both parents' age, the highest educational level attained among parents (higher education or below), whether parents had separated or divorced, and

the number of siblings of the individual. In the occurrence of missing values to control variables, the observation about that individual was taken out of the sample; doing otherwise would have required numerical estimation.[51]

Differently from Alderotti et al. (2024), the present analysis takes into account the entire trajectory of the individuals' professional life from the entry into the labor market until the current or last occupation. This choice was made to assess the weight of the professional life of women on their fertility choices over their entire life, until the time of observation. (Quasi-)completed fertility is modelled using a $logit$ model. As the dependent variable (number of children) is categorical (0, 1, and 2 or more children) and can take on three values ($J = 3$), multinomial logistic regression (MLR) represents the most fit model to assess whether a relationship exists between the sample's (quasi-)completed fertility and labor market-related variables.

$$logit[P(Y_i = j)] = \beta_{j0} + \beta_{j1}x_{i1} + \cdots + \beta_{jk}x_{ik}$$

Or, to calculate the probability itself

$$P(Y_i = j) = \frac{e^{\beta_{j0}+\beta_{j1}x_{i1}+\cdots+\beta_{jk}x_{ik}}}{\sum_{m=1}^{J} e^{\beta_{j0}+\beta_{j1}x_{i1}+\cdots+\beta_{jk}x_{ik}}}$$

for j = 1, 2 … J, where one category is chosen as the reference (or baseline) category. In this case, being childless was identified as the origin state. As per the other components, $P(Y_i = j)$ represents the probability that individual i falls under category j (whether the woman has zero, one or two or more children).

The variables about part-time and temporary employment duration were dichotomized, again according to the binary interpretation of at least one or no months of experience under each working condition.[52] Dichotomization is useful to better explain the effect of independent variables on fertility, as the structure and information contained in the dataset may otherwise condition statistical analysis results. Also, Principal Component Analysis (PCA) was conducted as a preliminary study to reduce issues of collinearity. In this case, PCA was used to measure the impact of an ordinal independent variable over the dependent variable by computing a value corresponding to the ordinal value originally assumed by the same variable. In other words, PCA can assess the magnitude of an independent variable's influence on the dependent one by overcoming the issue of ordinal values. Instead of considering each dummy variable individually, the principal component (through the

[51] Alderotti et al. (2024) impute missing values for control variables through multiple imputations by chained equations.

[52] Dichotomization: the dichotomized were given the value 1 if the woman had at least 1 month of experience under those working conditions; if the opposite was true, they were given the value 0.

loadings) represents a weighted linear combination of all the original variables. Principal components were compiled by calculating loadings for each variable except for the number of children and the age class. In PCA, loadings represent the coefficients that describe the relationship between the original variables and the principal components. They can be seen as the weights that link the original variables to the new variables (the principal components) created by PCA. In order to assess if loadings were better suited to fit the $logit$ model, both original values and loadings were tested with the model; the latter proved more fit and were thus considered to conduct the statistical study on fertility and career.

To check the robustness of results, the root mean square error (RMSE) was computed to measure the average difference between the $logit$ model's predicted values and its actual values.

$$RMSE = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(Y_i - \hat{Y}_i)^2}$$

where Y_i and $\hat{Y}_i$ are, respectively, the actual and the predicted value of observation i. RMSE is a metric that makes it possible to evaluate the accuracy of a predictive model and to identify which estimate is more efficient.

To facilitate the interpretation of the results obtained by running the $logit$ model, two additional statistical analysis were conducted. Firstly, average marginal effects (AMEs) were computed to help interpret the impact of the independent variables on the three potential fertility outcomes.

$$AME_k = \frac{1}{N}\sum_{i=1}^{N}\frac{\partial P(Y_i)}{\partial X_k}$$

where $\frac{\partial P(Y_i)}{\partial X_k}$ measures the marginal effect of X_k on $P(Y)$, which represents how much the probability changes when X_k increases by 1 unit. This type of test is used to measure the average marginal impact of a change in the explanatory variable on the probability of each outcome, keeping all other variables constant. In other words, AMEs make it possible to measure the effect of a variable as a change in probability. In particular, it is possible to assess this effect in the medium- or long-run.

Secondly, mean predict probability (MPP) was computed in order to strengthen model validation.

$$MPP = \frac{1}{N}\sum_{i=1}^{N}\hat{P}_i$$

where N is the number of observations and $\hat{P}_i$ is the predicted probability of an outcome for observation i. MPP provides an idea of how the predictor variable is associated with the probability that the outcome belongs to each category. In this case, the effect of the predictor is assessed in the short-run.

Finally, the study includes interactions between part-time and temporary employment in the MLR analysis. This allows to better understand the relationship between the two, as the labor market allows for combinations of both types of employment, which women may resort in order to increase their economic stability in case they do not work under a permanent working arrangement.

3.2.3. Results

Descriptive statistics of the sample are presented in **Table G**, for the whole sample, and **H**. To ensure continuity with the previous Chapter, **Table H** illustrates the composition of the cohorts considered in the previous Chapter that are included in the larger sample on which the statistical analysis is conducted. As discussed in the previous Chapter, the number of children per woman has declined across the three generations, while the number of childless women has grown. Again, while the data regarding the 1962-1966 and 1972-1976 cohorts corresponds or is close to completed fertility, that in the 1982-1986 column concerns women who had just reached the age at which Italian women born in those years were entering motherhood. In other words, the large gap between the former and the latter may have been at least partly filled in time.

Educational levels do not seem to have risen overtime; on the contrary, across the three generations observed it seems that the percentage of higher educated women has diminished. Such results depend on the structure of the dataset of women selected to conduct the occupational life course analysis of fertility, since as explained in the previous Chapter, the share of women with a degree from each cohort is considerably higher than the percentages shown in both Tables below. This could be due to biases emerging after selecting the women that have had at least one job in their life, leaving out roughly half of the entire population sample.[53] While this would seem to suggest that well-educated women were less likely to enter the workforce compared to their lower educated counterparts, such a statement cannot be made because of selection biases. Therefore, the argument according to which well educated women are likely to work and tend to be more attached to their career is not invalidated.

With regards to employment related data, all three independent variables confirm the hypothesis that unstable occupations became more common over time, in particular due to the dualizing policies put in place since the end of the 1990s. As expected, the number of women under a temporary contract

[53] Of 12,714 women that answered the FSSCV questionnaire, only 6,770 figured as having had at least one month of work in their life. Such selection was based on whether they declared to ever have had a job or to have been under a work contract at the time of interview.

grew across generations, as the use of this type of working arrangements among employers increased. With regards to part-time employment, which was initially not widely present in Italy as in other Mediterranean countries, a rise in part-time female workers can be observed across the three generations, embodying the spread of this practice from continental to southern Europe. On the contrary, the share of women employed in male-dominated occupations seems to have stayed the same for the three cohorts at around 59%, whereas the percentage is slightly lower for the whole sample. The percentage difference is likely to be due to lower female employment for older cohorts or, less likely, to higher rates for younger cohorts.

Table G. Descriptive statistics of labor market-related variables for Italian women. *FSSCV.*

	N	%
Number of children		
0	1332	19,68
1	1797	26,54
2 or more	3641	53,78
Educational level		
Low	6151	90,86
High	619	9,14
Part-Time		
Never	4307	63,62
At least 1 month	2463	36,38
Employment in male-dominated fields		
Never	2910	42,98
At least 1 month	3860	57,02
Temporary contract		
Never	2192	32,38
At least 1 month	1668	24,64

Table H. Descriptive statistics of labor market-related variables by cohort. Italian women born in 1962-1966, 1972-1976 and 1982-1986. *FSSCV.*

	1962-1966		1972-1976		1982-1986	
	(N)	(%)	(N)	(%)	(N)	(%)
Number of children						
0	79	16,60	287	24,43	159	26,59
1	120	25,21	319	27,15	186	31,10
2 or more	277	58,19	569	48,43	253	42,31
Educational level						
Low	460	96,64	1171	99,66	598	100,00
High	16	3,36	4	0,34	0	0,00
Part-Time						
Never	281	59,03	674	57,36	317	53,01
At least 1 month	195	40,97	501	42,64	281	46,99
Employment in male-dominated fields						

Never	198	41,60	471	40,09	240	40,13
At least 1 month	278	58,40	704	59,91	358	59,87
Temporary contract						
Never	291	61,13	692	58,89	305	51,00
At least 1 month	185	38,87	483	41,11	293	49,00

When the *logit* model is applied to check for labor market-related predictors, it is found that they have a definite influence on (quasi-)completed fertility of Italian women (**Table I**).[54] The employment status of a woman seems to be crucial for predicting fertility levels, as it determines the time allocated to the private sphere and family building. Temporary contracts and jobs in male-dominated fields are hindering fertility, providing support for *H2* and *H3* respectively, whereas part-time employment is more compatible with childbearing, providing support for *H1*. As expected, employment instability and too little time to dedicate to the family decrease a woman's fertility outcomes. In addition, when women are able to achieve more economic security by combining a part-time job with a second temporary contract, their fertility outcomes are higher. More specifically, if part-time and temporary employment are considered together, the latter has a stronger positive influence than the former.[55] To summarize, fertility levels rise when women can allocate more time to family matters, as in the case of part-time employment; also, higher paid working arrangements, such as the combination of part-time and temporary employment, can contribute to raising the number of children.

For what concerns individual and background variables, many observations can be made. At the individual level, women's age is positively linked to fertility outcomes, even strongly for second and higher order births. This is due to the phenomenon of fertility recuperation, according to which women postpone childbearing for years and are later subject to a squeeze effect due to the approaching end of their reproductive window. The level of education is negative and significant for all birth orders and it is slightly stronger for second and higher order births. In other words, Italian well-educated women tend to have lower fertility outcomes; in particular, they are less likely to have a second (or higher order) birth than less educated women. Such behavior could be because of fertility postponement due to longer enrollment periods or delayed family-building in favor of personal actualization. Parents' level of education is negative and significant, as well as if they separated; in both cases, women have lower fertility outcomes. The place of birth (macro-area) is positively correlated with fertility outcomes, confirming that in certain areas contextual factors may be conducive to larger families; in this case, women from southern Italy are more likely to have more births. Finally, a higher number of siblings positively influences fertility, as according to socialization

[54] Additional robustness analyses (MPP and AMEs) can be found in **Table J**, in the Appendix.
[55] This is indicated by the *I* computations in **Table I**.

arguments individuals growing up in larger families are more likely to have larger families themselves.

Table I. Estimation table for women by number of children and occupational characteristics. *FSSCV.*

Y (y=0 baseline)	Outcome	Coefficient	Std.Error	z.value	p.value	significant codes
1	(Intercept)	-0,6453	0,2203	-2,9295	0,0034	***
2	(Intercept)	-0,9777	0,1994	-4,9041	0,0000	***
1	fathage_birth	0,1180	0,0455	2,5958	0,0094	***
2	fathage_birth	0,2411	0,0412	5,8512	0,0000	***
1	mothage_birth	-0,1957	0,0497	-3,9373	0,0001	***
2	mothage_birth	-0,2741	0,0451	-6,0765	0,0000	***
1	**highedu_parent**	-0,0883	0,0362	-2,4403	0,0147	**
2	**highedu_parent**	-0,1183	0,0326	-3,6258	0,0003	***
1	**highedu**	-0,3080	0,0426	-7,2267	0,0000	***
2	**highedu**	-0,4637	0,0386	-12,0011	0,0000	***
1	area_bin2	0,0771	0,1031	0,7475	0,4548	
2	**area_bin2**	-0,4944	0,0927	-5,3312	0,0000	***
1	**bplace_bin**	0,1923	0,1064	1,8070	0,0708	*
2	**bplace_bin**	0,5031	0,0957	5,2598	0,0000	***
1	**dem_employ_month**	-0,1741	0,0494	-3,5266	0,0004	***
2	**dem_employ_month**	-0,2340	0,0442	-5,2916	0,0000	***
1	siblings	0,0101	0,0511	0,1974	0,8435	
2	**siblings**	0,2592	0,0458	5,6606	0,0000	***
1	**separ_parent**	-0,1378	0,0408	-3,3801	0,0007	***
2	**separ_parent**	-0,1807	0,0369	-4,8934	0,0000	***
1	**mean_age**	0,0179	0,0040	4,4956	0,0000	***
2	**mean_age**	0,0403	0,0036	11,1772	0,0000	***
1	**I(d_temp* partime_month)**	0,0021	0,0011	1,9994	0,0456	**
2	**I(d_temp* partime_month)**	0,0021	0,0010	2,1374	0,0326	**
1	**I(d_partime * temp_month)**	-0,0062	0,0013	-4,7876	0,0000	***
2	**I(d_partime * temp_month)**	-0,0073	0,0012	-6,3198	0,0000	***

Note: * P < 0.10; ** P < 0.05; *** P < 0.001. Variables whose influence is significant are in bold.

3.2.4. Discussion and limitations

The findings are largely compatible with existing literature. In particular, the degree of protection, stability and flexibility of work contracts is proved to be a major determining factor for fertility levels in the case of women in the labor force. Firstly, the possibility to work part-time is conducive to higher fertility levels. This is because the limited number of working hours and the flexibility offered by this type of working arrangements is more compatible with the needs to care for the family and children compared to other jobs. Beyond the possibility to allocate time for the family favoring childrearing, part-time solutions also represent a crucial option for women that want to have a salary along with taking care of their offspring. The shorter workday allows them to reconciliate work and family without having to choose between the two, securing a second wage within the couple. On the other hand, part-time work in Italy is not necessarily associated with stability and security: although it provides monetary resources and time, it may be correlated with precarious or poor paid occupations. Instead, it is particularly benefitting when the woman is employed in the public sector where reducing the duration of the workweek does not take away any of the employment protections and benefits usually offered by this sector.

Secondly, positions in male-dominated fields, where women are required to work beyond usual workhours, correspond to lower fertility compared to women employed elsewhere. They tend to have time-demanding work norms and to offer less opportunities of part-time work, which are rarely considered a necessity due to a culture of "masculinity" which is normally not associated with care duties (Home et al., 2006a). As anticipated in the previous Chapter, Italian society is organized according to the traditional gender-typical role of women that are expected to do the care work in the family. Childhood services are supplied in limited amounts and often incompatible with full working days. Moreover, since gender egalitarianism has only emerged in recent decades and is still not widely shared, even in families where the woman is employed housework and care work are usually performed by her. Only in the minority of cases men and women share the same amount of house chores and childrearing responsibilities. If time matters for childrearing, then the opposite would be true for women working part-time jobs (which is aligned with the findings) and for women employed in more flexible positions, such as the public sector, with more time to dedicate to the family. As a consequence, women employed in male-dominated sectors tend to be less likely to have large families.

Thirdly, precarious employment embodied in temporary working arrangements is negatively related to fertility. In particular, the higher the number of jobs under a temporary solution, the lower the probability of having children. On one hand, women in temporary employment may waiting for the right time to come for building a family. Career-oriented women may wait for a permanent contract, whereas family-oriented women may postpone their fertility until when they decide to have children

independently of their working status. In the latter case, they may decide to leave the labor force permanently.[56] On the other hand, the negative relationship is due to how women perceive their employment and economic status vis-à-vis the possibility to have larger families. Under temporary contracts, even if they are employed for a long time, they do not feel secure enough to transition to enlarge their families. On the contrary, women working under permanent contracts or women outside the labor force may have higher fertility outcomes. In the former case, permanent contracts offer higher levels of stability, security and benefits. In the latter, women in families or couples that are already well-off might not need to work to raise the family's economic resources needed for family-building, in turn devoting more time to childrearing. In short, being employed under a temporary contract is a measure of unstable employment; the results obtained concerning this variable, then, contribute to the findings of Alderotti et al. (2024) who focused specifically on employment instability and the insecurity that comes from it and affects fertility behaviors.

The impact of temporary and part-time employment may also be interpreted as an interaction between the two variables. A woman employed under a temporary contract may not feel secure enough to transition to childbirth. For this reason, she might look for a part-time occupation that raises her economic capabilities in both the short- and the long-run. It follows, women may choose a mixed strategy combining temporary and part-time work to increase their economic and childbearing capabilities. In this case, temporary employment seems to have a stronger positive influence on fertility compared to part-time arrangements. On the other hand, when part-time and temporary employment are considered separately, the former may fail to have a positive effect, while the latter may have a negative influence on fertility outcomes as the wages and benefits they offer are insufficient to cover the expenses of having children.

As argued in the previous sections, education plays a role in the occupational history of Italian women. Depending on the field of study, in particular, women condition their future labor market opportunities. In Italy, it is unlikely that a student changes educational path, as the school system is rigid and does not support such decisions. Therefore, the field of study, especially when it is connected to specific occupations, is a good predictor of whether women will encounter labor market conditions such as temporary contracts and employment in male-dominated fields. Sex segregation in employment determines the level of wages and of contract security and stability enjoyed by the individuals. Certain occupational fields may be characterized by a misalignment between labor demand and labor supply, decreasing individuals' opportunities to get a job in that sector or increasing the waiting time for a stable, well-paid or permanent contract. Such labor conditions may be hindering

[56] Women in temporary working arrangements are significantly more likely to drop out permanently of the labor force after childbirth compared to women in permanent positions (Casadio et al., 2008).

family-building. On the contrary, working conditions more compatible with childbearing such as those encountered in the public sector, where women make up the largest share of workers, raise women's fertility outcomes. However, it must be highlighted that linking educational paths with professional careers would require a complex and attentive analysis of the multiple mechanisms intervening in the relationship between the two variables, which goes beyond the scope of this thesis. What is found by the present analysis is that certain working conditions hamper or encourage fertility choices across educational levels; then, controlling educational differentials, it is found that fertility decreases with increasing educational levels.

It must be stated that the present analysis has some limitations. Firstly, the information contained in the dataset could be subject to memory bias, as when the individuals answered the questionnaire, they had to provide data about events up to several decades earlier, it is possible that occupational information such as start and end date of jobs, used to estimate the duration of the three employment conditions considered, might be inaccurate. Nonetheless, the magnitude of this error, if present, should not be as significant as contradicting the findings of this study. Secondly, women's decisions about their professional career and family may be influenced by variables that were not considered in this analysis. For example, no characteristics about partners were included, either from the labor market or the relationship perspective. Both may play an important role in increasing or diminishing women's fertility as well as impacting their decisions to leave or remain in the labor force. Finally, it was not possible to conduct a statistical analysis of intergenerational fertility behaviors through a $logit$ model, as the samples for each generation were too small to provide significant results. In fact, MLR generally requires a minimum number of observations per parameter per outcome category; when samples are not as large as necessary, it may lead to high standard errors and unreliable significance tests. In this case, it is precisely the significance of results that is lost when applying the $logit$ model to the smaller generational samples. As a consequence, it is not possible to demonstrate how the influence of labor market-related variables on fertility has changed for women born in different cohorts.

3.3. Summary

Educational career decisions concerning disciplines and field of study originate from two main mechanisms, namely socialization and selection. First, early life socialization first helps form attitudes towards several events of one's life course, among which the occupational and fertility paths. Second, socialization in the educational system, depending on the field of study, might reinforce or counter the pre-existing attitudes formed during childhood. Third, self-selection is a rational decision

taken by women taking into account their personal orientation towards a professional career and childbearing. Depending on which prevails, they choose different life paths, first in terms of educational career and later in terms of employment, based on how compatible their preferences are with the alternative educational and occupational options. Therefore, education plays a crucial role in shaping women's occupational paths and fertility choices. Women in traditionally feminine fields, such as education and healthcare, tend to have higher fertility intentions and transition to motherhood earlier, as these fields align with traditional gender norms and offer better reconciliation between work and family life. Self-selection into these fields may reflect pre-existing family-oriented values. The relationship between education and career is then conditional on the contextual framework characterizing one country. In Italy, educational choices are shaped by individual preferences, social norms, and institutional constraints that pervade the Italian peninsula. The rigid education system limits flexibility throughout the educational career, reinforcing early gender segregation and conditioning one's future life path. From the perspective of horizontal segregation, women dominate humanities and related fields, while they are underrepresented in STEM studies. This gendered educational trajectory later influences labor market outcomes, where women are concentrated in lower-paying, flexible jobs in the public and service sectors more compatible with their studies and their role in the family. Such jobs support family-building due to working conditions that are more compatible with having children, thanks to higher flexibility, more protection and the low need to work overtime. On the other hand, women's jobs often come with lower probability to access well-paid managerial positions or, especially in other sectors, with lower wages and precarious contracts, making motherhood more challenging. In fact, employment conditions, contract stability, and sectoral segregation significantly impact fertility decisions, with public sector jobs being more conducive to childbearing due to higher job stability, security and more parental benefits.

To assess the weight of employment conditions over Italian women, a study was conducted based on the work published by Alderotti et al. (2024) on the relationship between unstable employment and fertility. By adopting a MLR approach, the study aligns with existing literature, highlighting the significant role of work contract stability, flexibility, and protection in shaping women's fertility decisions. Part-time employment is associated with higher fertility rates due to its compatibility with family life, but its benefits depend on job stability; then, such positive influence can be found when part-time occupations belong to the public sector. Conversely, women in male-dominated industries, where long hours and rigid work norms prevail, tend to have lower fertility rates due to a lack of work-life balance. Also, temporary employment negatively impacts fertility, as job insecurity discourages childbearing. Women under temporary contracts may delay motherhood while seeking job stability or choose to exit the workforce entirely. Interestingly, when women combine temporary

and part-time work to improve economic stability, their chances at higher fertility outcomes increase. However, when analyzed separately, the positive influence of temporary and part-time employment may be lost when they do not provide sufficient economic security for family expansion.

In summary, employment conditions deeply affect women's fertility behaviors. In general, unstable employment, such as atypical working arrangements and unemployment spells, determines lower fertility levels (Alderotti et al., 2024). Further analyses prove that other working conditions, such as temporary contracts and jobs in male-dominated fields, also negatively affect fertility, while part-time employment may be conducive to childbearing. The educational path chosen when women were still enrolled in the education system might determine their chances at getting a more fertility-conducive occupation, ultimately demonstrating the interplay between education, employment and fertility.

CONCLUSION

This thesis has explored the complex relationship between education and fertility, with a particular focus on the Italian case. The analysis has demonstrated how educational enrollment and attainment influence fertility intentions, behaviors, and outcomes, shaping demographic trends and broader social, political and economic dynamics. The findings highlight the multifaceted nature of this association, wherein education acts as both a determinant and a mediator of fertility decisions at all birth orders and even before childbearing takes place.

The evidence presented confirms that higher levels of education are generally associated with delayed childbearing and lower completed fertility for Italian women, a trend that has been observed across generations. This pattern is largely explained by the interplay between education and labor market participation, the pursuit of economic stability, shifting social norms regarding gender roles and family formation, and other contextual factors such as government policies. More specifically, highly educated women tend to postpone motherhood due to career aspirations and economic considerations, often recurring to fertility recuperation at later ages to make up for lost time. However, it is argued that the recovery of fertility is not sufficient to fill the gap between their intended and actual number of children once they reach the end of their reproductive window, nor to compensate for declining number of births in the country. Therefore, better educated women still tend to have smaller families than the lower educated and their fertility postponement has had a major impact on declining fertility levels in Italy.

The analysis also underscores the role of contextual factors, such as labor market conditions, welfare policies, and cultural norms, in mediating the effects of education on fertility. In Italy, the persistently low fertility rates are partially attributed to structural challenges and rigidities, including limited family-support policies, rigid labor markets, and persistent gender inequalities in household and family responsibilities. These factors exacerbate the opportunity costs associated with childbearing, particularly for educated women, making it difficult for them to balance professional ambitions with family life. In fact, well educated women are more likely to be career-oriented, to have developed an attachment to the labor market allowing them to pursue personal and professional goals, and to have well-paid jobs; therefore, the opportunity costs of leaving the labor force are higher for them compared to the lower educated.

A generational analysis of the impact of education on fertility sheds light to how the influence of the former over the latter has changed. By considering three generations of Italian women born in the second half of the 20th century, it is possible to see that education has consistently played a role in determining fertility outcomes, despite wavering contextual factors. What has changed, instead, is the

interplay of the two variables vis-à-vis the broader social and economic context. Changing and modernizing social norms about gender equality and the public perception of women have contributed to the emancipation of women, despite the still low female labor force participation. Policies affecting the functioning of the labor market have altered the opportunities offered to young individuals and women, whose chances at permanent and well-paid employment have not improved. More specifically, the spread of temporary contracts has reduced both employment stability and economic security, making it even more difficult for Italian couples to transition to childbearing and to build large families. The recent rising trend of part-time employment may be regarded as a feasible solution to the conflict between work and family encountered by Italian women as the workday is reduced. However, part-time contracts are generally associated with lower salaries and precarious occupations which ultimately hamper fertility. Sex segregation also affects fertility levels by encouraging or diminishing fertility outcomes; while female-dominated fields offer more benefits and flexibility, male-dominated sectors are less compatible with fertility, especially because of long working hours. It follows, women that find themselves in an occupation falling in one of the three categories are less likely to have large families or to have no children at all. Such labor market-related variables can be linked to educational choices and attainment, as the educational career heavily influences a woman's choices in terms of occupation and fertility; in particular, the educational path may determine the chances that women have to find themselves in working conditions hindering or favoring fertility. Finally, even wider dynamics such as economic downturns have further re-shaped the context where the interplay between education and fertility occurs.

Despite the general trend of declining fertility among highly educated Italian women, recent evidence suggests that under certain conditions, education can support rather than hinder fertility. In societies with strong family policies, gender-equal labor markets and societies, and accessible childcare services, fertility rates among educated women tend to be higher. This indicates that policy interventions can play a crucial role in mitigating the negative association between education and fertility.

The implications of these findings are particularly relevant for policymakers seeking to address Italy's demographic challenges. To counteract the negative effects of low fertility on population aging and economic sustainability, Italian governments need to enact a multifaceted plan. This would include policies aimed at reducing the work-family conflict, promoting gender equality in both the labor market and the household, and creating an economic environment that supports young couples and families, intervening on the structural challenges and rigidities that hinder fertility. Measures such as increased parental leave, increased availability of flexible work arrangements, of gender equality in

the workplace, and of subsidized childcare could facilitate a more favorable environment for family formation, particularly for what concerns better educated women.

In conclusion, the relationship between education and fertility is neither linear nor fixed in time but is instead shaped by a combination of individual choices and broader societal factors. Understanding these dynamics is essential for developing effective strategies to address declining birth rates while ensuring that education continues to serve as a driver of social and economic progress. By fostering policies that support work-life balance and gender equality, as well as measures that contrast the challenges and rigidities of the labor market, Italy can create conditions that enable individuals to achieve their desired fertility while benefiting from the advantages of an educated workforce.

Appendix

Table J. Mean Predicted Probability (MPP) on the left; Average Marginal Effects (AMEs) on the right. *FSSCV.*

Variable	prob_0	prob_1	prob_2	AME_0	AME_1	AME_2
fathage_birth	-0,0117	-0,0055	0,0172	-0,0333	-0,0115	0,0447
mothage_birth	0,0355	0,0091	-0,0446	0,0601	0,0113	-0,0713
highedu_parent	0,0119	-0,0023	-0,0095	0,0105	-0,0028	-0,0077
highedu	0,0337	-0,0016	-0,0321	0,0408	-0,0022	-0,0385
area_bin2	0,1086	0,1526	0,2612	0,0035	0,0610	-0,0644
bplace_bin	0,1313	0,1808	0,3536	-0,0182	-0,0129	0,0312
dem_employ_month	0,0264	0,0225	-0,0489	0,0399	0,0055	-0,0454
siblings	0,0001	-0,0147	0,0146	-0,0011	-0,0230	0,0241
separ_parent	0,0028	-0,0125	0,0097	0,0094	-0,0093	-0,0002
mean_age	10,0472	13,5604	27,3976	0,0000	0,0000	0,0000
partime_month_bin	6,0581	11,0353	26,6258	0,0000	0,0001	-0,0001
temp_month_bin	4,0528	6,4412	16,7428	0,0004	0,0000	-0,0003
d_partime	0,0594	0,0931	0,2113	0,0250	-0,0010	-0,0241
d_temp	0,0665	0,1006	0,2213	-0,0030	0,0093	-0,0063

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